

In [1]:

```
from keras.datasets import mnist
from keras.layers import Input, Dense, Reshape, Flatten, Dropout
from keras.layers import BatchNormalization, Activation, ZeroPadding2D, UpSampling2D, Conv2D, MaxPooling2D
from keras.layers.advanced_activations import LeakyReLU
from keras.models import Sequential, Model
from keras.optimizers import Adam, SGD

import plotly
import plotly.plotly as py
from plotly.offline import iplot
import plotly.graph_objs as go

import matplotlib.pyplot as plt
from mpl_toolkits.axes_grid1 import make_axes_locatable
from matplotlib.colors import LogNorm

import h5py

import sys

import numpy as np
```

Using TensorFlow backend.

In [2]:

```
import keras
print(keras.__version__)
```

2.1.5

In [3]:

```
plotly.offline.init_notebook_mode()
```

In [4]:

```
def load_data():
    np_data = np.load('/data/jet-images/minus_Ele-Eta0-PhiPiOver2-Energy50.npy')
    np.random.shuffle(np_data)
    training_size = int(np_data.shape[0]*0.8)
    training, testing = np_data[:training_size,:,:,:], np_data[training_size,:,:,:]

    return training, testing
```

In [5]:

```
def plot_heatmap(data, name):
    fig, ax = plt.subplots()
    norm = LogNorm(vmin=0.0001, vmax=data.max())
    im0 = ax.imshow(data, cmap='inferno', norm=norm)
    ax.set_title(name)
    ax.set_xlabel('Displaced iPhi')
    ax.set_ylabel('Displaced iEta')
    cax = make_axes_locatable(ax).append_axes("right", size="5%", pad=0.05)
    plt.colorbar(im0, cax=cax)
    plt.show()
```

In [6]:

```
%matplotlib inline
```

In [15]:

```
def generate_image_sample(quantity=1):
    gen_imgs = np.zeros((quantity,*img_shape))
    g = build_generator()
    g.compile(loss='binary_crossentropy', optimizer="SGD")
    g.load_weights('generator')
    noise = np.random.uniform(-1, 1, size=(1, 100))
    for i in range(quantity):
        gen_imgs[i] = g.predict(noise) [0]
    return gen_imgs
```

In [8]:

```
def save_imgs(epoch):
    sample = generate_image_sample()
    plot_heatmap(np.squeeze(sample[0],axis=2),"Electron - Epoch {}".format(epoch))
```

In [9]:

```
def build_generator():
    model = Sequential()
    model.add(Dense(input_dim=100, units=1024))
    model.add(Activation('tanh'))
    model.add(Dense(128*7*7))
    model.add(BatchNormalization())
    model.add(Activation('tanh'))
    model.add(Reshape((7, 7, 128), input_shape=(128*7*7,)))
    model.add(UpSampling2D(size=(2, 2)))
    model.add(Conv2D(64, (5, 5), padding='same'))
    model.add(Activation('tanh'))
    model.add(UpSampling2D(size=(2, 2)))
    model.add(Conv2D(1, (5, 5), padding='same'))
    model.add(Activation('tanh'))

    model.summary()

    return model
```

In [10]:

```
def build_discriminator():
    model = Sequential()
    model.add(
        Conv2D(64, (5, 5),
               padding='same',
               input_shape=img_shape)
    )
    model.add(Activation('tanh'))
    model.add(MaxPooling2D(pool_size=(2, 2)))
    model.add(Conv2D(128, (5, 5)))
    model.add(Activation('tanh'))
    model.add(MaxPooling2D(pool_size=(2, 2)))
    model.add(Flatten())
    model.add(Dense(1024))
    model.add(Activation('tanh'))
    model.add(Dense(1))
    model.add(Activation('sigmoid'))

    model.summary()
    return model
```

In [11]:

```
def build_generator_containing_discriminator(generator, discriminator):
    model = Sequential()
    model.add(generator)
    discriminator.trainable = False
    model.add(discriminator)
    return model
```

In [12]:

```
def train(epochs, batch_size=128, save_interval=50):

    X_train, _ = load_data()

    X_train = np.expand_dims(X_train, axis=3)

    d = build_discriminator()
    g = build_generator()
    d_on_g = build_generator_containing_discriminator(g, d)
    d_optim = SGD(lr=0.0005, momentum=0.9, nesterov=True)
    g_optim = SGD(lr=0.0005, momentum=0.9, nesterov=True)
    g.compile(loss='binary_crossentropy', optimizer="SGD")
    d_on_g.compile(loss='binary_crossentropy', optimizer=g_optim)
    d.trainable = True
    d.compile(loss='binary_crossentropy', optimizer=d_optim)
    for epoch in range(epochs):
        print("Epoch is", epoch)
        print("Number of batches", int(X_train.shape[0]/batch_size))
        for index in range(int(X_train.shape[0]/batch_size)):
            noise = np.random.uniform(-1, 1, size=(batch_size, 100))
            image_batch = X_train[index*batch_size:(index+1)*batch_size]
            generated_images = g.predict(noise, verbose=0)
            X = np.concatenate((image_batch, generated_images))
            y = [1] * batch_size + [0] * batch_size
            d_loss = d.train_on_batch(X, y)
            print("batch %d d_loss : %f" % (index, d_loss))
            noise = np.random.uniform(-1, 1, (batch_size, 100))
            d.trainable = False
            g_loss = d_on_g.train_on_batch(noise, [1] * batch_size)
            d.trainable = True
            print("batch %d g_loss : %f" % (index, g_loss))
            if index % save_interval == 0:
                save_imgs(epoch)
                g.save_weights('generator', True)
                d.save_weights('discriminator', True)
```

In [13]:

```
img_rows = 28
img_cols = 28
channels = 1
img_shape = (img_rows, img_cols, channels)
```

In [17]:

```
train(epochs=20, batch_size=128, save_interval=100)
```

Layer (type)	Output Shape	Param #
conv2d_205 (Conv2D)	(None, 28, 28, 64)	1664
activation_409 (Activation)	(None, 28, 28, 64)	0
max_pooling2d_5 (MaxPooling2D)	(None, 14, 14, 64)	0
conv2d_206 (Conv2D)	(None, 10, 10, 128)	204928
activation_410 (Activation)	(None, 10, 10, 128)	0
max_pooling2d_6 (MaxPooling2D)	(None, 5, 5, 128)	0
flatten_3 (Flatten)	(None, 3200)	0
dense_205 (Dense)	(None, 1024)	3277824
activation_411 (Activation)	(None, 1024)	0

dense_206 (Dense)	(None, 1)	1025
activation_412 (Activation)	(None, 1)	0

Total params: 3,485,441  
Trainable params: 3,485,441  
Non-trainable params: 0

Layer (type)	Output Shape	Param #
dense_207 (Dense)	(None, 1024)	103424
activation_413 (Activation)	(None, 1024)	0
dense_208 (Dense)	(None, 6272)	6428800
batch_normalization_101 (Batch Normalization)	(None, 6272)	25088
activation_414 (Activation)	(None, 6272)	0
reshape_101 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_201 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_207 (Conv2D)	(None, 14, 14, 64)	204864
activation_415 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_202 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_208 (Conv2D)	(None, 28, 28, 1)	1601
activation_416 (Activation)	(None, 28, 28, 1)	0

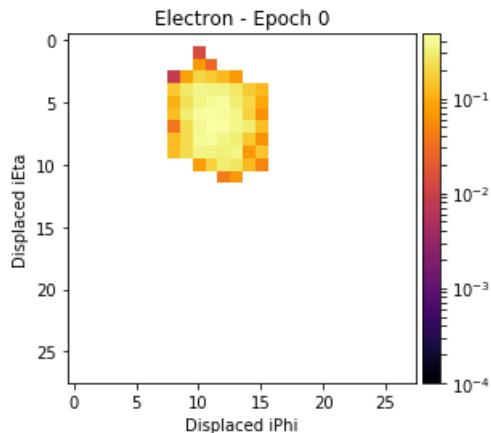
Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544

Epoch is 0  
Number of batches 130  
batch 0 d\_loss : 0.760900  
batch 0 g\_loss : 0.710877

Layer (type)	Output Shape	Param #
dense_209 (Dense)	(None, 1024)	103424
activation_417 (Activation)	(None, 1024)	0
dense_210 (Dense)	(None, 6272)	6428800
batch_normalization_102 (Batch Normalization)	(None, 6272)	25088
activation_418 (Activation)	(None, 6272)	0
reshape_102 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_203 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_209 (Conv2D)	(None, 14, 14, 64)	204864
activation_419 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_204 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_210 (Conv2D)	(None, 28, 28, 1)	1601
activation_420 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233

trainable params: 0, 0.01, 200  
Non-trainable params: 12,544



```
batch 1 d_loss : 0.737890
batch 1 g_loss : 0.711158
batch 2 d_loss : 0.712156
batch 2 g_loss : 0.700487
batch 3 d_loss : 0.681578
batch 3 g_loss : 0.687576
batch 4 d_loss : 0.653759
batch 4 g_loss : 0.681572
batch 5 d_loss : 0.621324
batch 5 g_loss : 0.671120
batch 6 d_loss : 0.594513
batch 6 g_loss : 0.662587
batch 7 d_loss : 0.568351
batch 7 g_loss : 0.656866
batch 8 d_loss : 0.543444
batch 8 g_loss : 0.650679
batch 9 d_loss : 0.519424
batch 9 g_loss : 0.638245
batch 10 d_loss : 0.510165
batch 10 g_loss : 0.627607
batch 11 d_loss : 0.491686
batch 11 g_loss : 0.626037
batch 12 d_loss : 0.480346
batch 12 g_loss : 0.620742
batch 13 d_loss : 0.464183
batch 13 g_loss : 0.613135
batch 14 d_loss : 0.461841
batch 14 g_loss : 0.618652
batch 15 d_loss : 0.455944
batch 15 g_loss : 0.611699
batch 16 d_loss : 0.440549
batch 16 g_loss : 0.611660
batch 17 d_loss : 0.425054
batch 17 g_loss : 0.614101
batch 18 d_loss : 0.432993
batch 18 g_loss : 0.614058
batch 19 d_loss : 0.420047
batch 19 g_loss : 0.611209
batch 20 d_loss : 0.414329
batch 20 g_loss : 0.614091
batch 21 d_loss : 0.418465
batch 21 g_loss : 0.617118
batch 22 d_loss : 0.410551
batch 22 g_loss : 0.620023
batch 23 d_loss : 0.405548
batch 23 g_loss : 0.627256
batch 24 d_loss : 0.396338
batch 24 g_loss : 0.624882
batch 25 d_loss : 0.408990
batch 25 g_loss : 0.626957
batch 26 d_loss : 0.391356
```

batch 26 g\_loss : 0.640307  
batch 27 d\_loss : 0.384473  
batch 27 g\_loss : 0.640983  
batch 28 d\_loss : 0.391828  
batch 28 g\_loss : 0.649565  
batch 29 d\_loss : 0.393016  
batch 29 g\_loss : 0.658300  
batch 30 d\_loss : 0.372589  
batch 30 g\_loss : 0.660138  
batch 31 d\_loss : 0.378065  
batch 31 g\_loss : 0.676328  
batch 32 d\_loss : 0.372081  
batch 32 g\_loss : 0.682418  
batch 33 d\_loss : 0.365275  
batch 33 g\_loss : 0.688969  
batch 34 d\_loss : 0.379172  
batch 34 g\_loss : 0.697686  
batch 35 d\_loss : 0.367961  
batch 35 g\_loss : 0.706266  
batch 36 d\_loss : 0.360458  
batch 36 g\_loss : 0.713369  
batch 37 d\_loss : 0.355406  
batch 37 g\_loss : 0.722328  
batch 38 d\_loss : 0.362143  
batch 38 g\_loss : 0.732974  
batch 39 d\_loss : 0.354065  
batch 39 g\_loss : 0.745172  
batch 40 d\_loss : 0.361347  
batch 40 g\_loss : 0.749853  
batch 41 d\_loss : 0.350921  
batch 41 g\_loss : 0.757375  
batch 42 d\_loss : 0.338396  
batch 42 g\_loss : 0.777707  
batch 43 d\_loss : 0.355953  
batch 43 g\_loss : 0.786170  
batch 44 d\_loss : 0.335996  
batch 44 g\_loss : 0.798912  
batch 45 d\_loss : 0.330379  
batch 45 g\_loss : 0.809578  
batch 46 d\_loss : 0.337816  
batch 46 g\_loss : 0.822088  
batch 47 d\_loss : 0.338373  
batch 47 g\_loss : 0.827233  
batch 48 d\_loss : 0.344016  
batch 48 g\_loss : 0.844805  
batch 49 d\_loss : 0.331472  
batch 49 g\_loss : 0.846194  
batch 50 d\_loss : 0.340646  
batch 50 g\_loss : 0.866287  
batch 51 d\_loss : 0.321357  
batch 51 g\_loss : 0.878319  
batch 52 d\_loss : 0.318025  
batch 52 g\_loss : 0.895997  
batch 53 d\_loss : 0.299596  
batch 53 g\_loss : 0.904549  
batch 54 d\_loss : 0.320896  
batch 54 g\_loss : 0.909822  
batch 55 d\_loss : 0.322728  
batch 55 g\_loss : 0.926204  
batch 56 d\_loss : 0.304038  
batch 56 g\_loss : 0.943475  
batch 57 d\_loss : 0.301811  
batch 57 g\_loss : 0.948690  
batch 58 d\_loss : 0.310857  
batch 58 g\_loss : 0.962784  
batch 59 d\_loss : 0.300212  
batch 59 g\_loss : 0.975673  
batch 60 d\_loss : 0.301718  
batch 60 g\_loss : 0.988239  
batch 61 d\_loss : 0.305466  
batch 61 g\_loss : 1.006347  
batch 62 d\_loss : 0.325328

batch 62 g\_loss : 1.017269  
batch 63 d\_loss : 0.289679  
batch 63 g\_loss : 1.033696  
batch 64 d\_loss : 0.285863  
batch 64 g\_loss : 1.054729  
batch 65 d\_loss : 0.285148  
batch 65 g\_loss : 1.061312  
batch 66 d\_loss : 0.302865  
batch 66 g\_loss : 1.076400  
batch 67 d\_loss : 0.278569  
batch 67 g\_loss : 1.091616  
batch 68 d\_loss : 0.300372  
batch 68 g\_loss : 1.099272  
batch 69 d\_loss : 0.292387  
batch 69 g\_loss : 1.119633  
batch 70 d\_loss : 0.287956  
batch 70 g\_loss : 1.125085  
batch 71 d\_loss : 0.266936  
batch 71 g\_loss : 1.148294  
batch 72 d\_loss : 0.288378  
batch 72 g\_loss : 1.164123  
batch 73 d\_loss : 0.269958  
batch 73 g\_loss : 1.178135  
batch 74 d\_loss : 0.261676  
batch 74 g\_loss : 1.189706  
batch 75 d\_loss : 0.290508  
batch 75 g\_loss : 1.211290  
batch 76 d\_loss : 0.263045  
batch 76 g\_loss : 1.224307  
batch 77 d\_loss : 0.260411  
batch 77 g\_loss : 1.241532  
batch 78 d\_loss : 0.276919  
batch 78 g\_loss : 1.259858  
batch 79 d\_loss : 0.254038  
batch 79 g\_loss : 1.263512  
batch 80 d\_loss : 0.265687  
batch 80 g\_loss : 1.286851  
batch 81 d\_loss : 0.265322  
batch 81 g\_loss : 1.299619  
batch 82 d\_loss : 0.261444  
batch 82 g\_loss : 1.318392  
batch 83 d\_loss : 0.239665  
batch 83 g\_loss : 1.338838  
batch 84 d\_loss : 0.243769  
batch 84 g\_loss : 1.353152  
batch 85 d\_loss : 0.260548  
batch 85 g\_loss : 1.375822  
batch 86 d\_loss : 0.232260  
batch 86 g\_loss : 1.388884  
batch 87 d\_loss : 0.242520  
batch 87 g\_loss : 1.409384  
batch 88 d\_loss : 0.232805  
batch 88 g\_loss : 1.430371  
batch 89 d\_loss : 0.225843  
batch 89 g\_loss : 1.435588  
batch 90 d\_loss : 0.228803  
batch 90 g\_loss : 1.467188  
batch 91 d\_loss : 0.228991  
batch 91 g\_loss : 1.482359  
batch 92 d\_loss : 0.250180  
batch 92 g\_loss : 1.497311  
batch 93 d\_loss : 0.218400  
batch 93 g\_loss : 1.493048  
batch 94 d\_loss : 0.238589  
batch 94 g\_loss : 1.534600  
batch 95 d\_loss : 0.214666  
batch 95 g\_loss : 1.541137  
batch 96 d\_loss : 0.230708  
batch 96 g\_loss : 1.552762  
batch 97 d\_loss : 0.217804  
batch 97 g\_loss : 1.575367  
batch 98 d\_loss : 0.205023

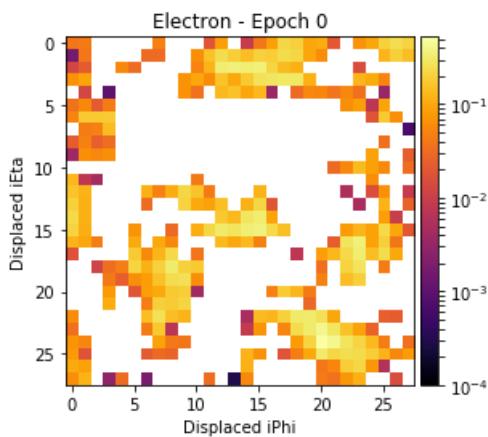
```

batch 98 g_loss : 1.603555
batch 99 d_loss : 0.219150
batch 99 g_loss : 1.609872
batch 100 d_loss : 0.205620
batch 100 g_loss : 1.638758

```

Layer (type)	Output Shape	Param #
dense_211 (Dense)	(None, 1024)	103424
activation_421 (Activation)	(None, 1024)	0
dense_212 (Dense)	(None, 6272)	6428800
batch_normalization_103 (Batch Normalization)	(None, 6272)	25088
activation_422 (Activation)	(None, 6272)	0
reshape_103 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_205 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_211 (Conv2D)	(None, 14, 14, 64)	204864
activation_423 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_206 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_212 (Conv2D)	(None, 28, 28, 1)	1601
activation_424 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 101 d_loss : 0.225437
batch 101 g_loss : 1.656241
batch 102 d_loss : 0.202067
batch 102 g_loss : 1.669179
batch 103 d_loss : 0.206158
batch 103 g_loss : 1.684603
batch 104 d_loss : 0.202983
batch 104 g_loss : 1.703490
batch 105 d_loss : 0.206859
batch 105 g_loss : 1.719499
batch 106 d_loss : 0.192537
batch 106 g_loss : 1.727914
batch 107 d_loss : 0.187683
batch 107 g_loss : 1.760041
batch 108 d_loss : 0.188571
batch 108 g_loss : 1.783194
batch 109 d_loss : 0.200027
batch 109 g_loss : 1.800666

```

```

batch 109 g_loss : 1.000000
batch 110 d_loss : 0.190451
batch 110 g_loss : 1.811185
batch 111 d_loss : 0.187840
batch 111 g_loss : 1.829431
batch 112 d_loss : 0.190766
batch 112 g_loss : 1.842462
batch 113 d_loss : 0.198500
batch 113 g_loss : 1.861722
batch 114 d_loss : 0.187710
batch 114 g_loss : 1.885847
batch 115 d_loss : 0.172803
batch 115 g_loss : 1.901716
batch 116 d_loss : 0.186001
batch 116 g_loss : 1.914857
batch 117 d_loss : 0.167570
batch 117 g_loss : 1.925100
batch 118 d_loss : 0.180124
batch 118 g_loss : 1.941932
batch 119 d_loss : 0.192217
batch 119 g_loss : 1.966622
batch 120 d_loss : 0.170705
batch 120 g_loss : 1.985797
batch 121 d_loss : 0.177931
batch 121 g_loss : 1.993726
batch 122 d_loss : 0.173099
batch 122 g_loss : 2.023595
batch 123 d_loss : 0.181679
batch 123 g_loss : 2.029233
batch 124 d_loss : 0.164913
batch 124 g_loss : 2.025903
batch 125 d_loss : 0.179208
batch 125 g_loss : 2.061604
batch 126 d_loss : 0.177659
batch 126 g_loss : 2.070991
batch 127 d_loss : 0.168563
batch 127 g_loss : 2.087802
batch 128 d_loss : 0.186804
batch 128 g_loss : 2.091493
batch 129 d_loss : 0.167662
batch 129 g_loss : 2.105266

```

Epoch is 1

Number of batches 130

```

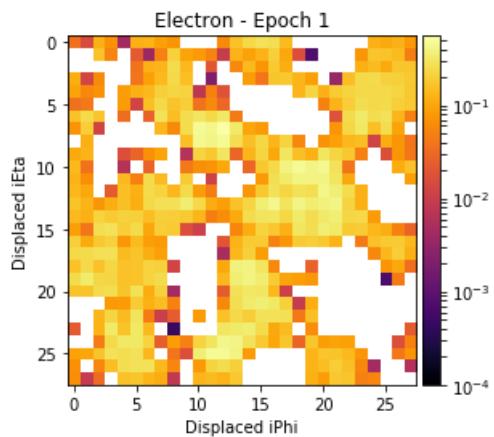
batch 0 d_loss : 0.143408
batch 0 g_loss : 2.120495

```

Layer (type)	Output Shape	Param #
<hr/>		
dense_213 (Dense)	(None, 1024)	103424
activation_425 (Activation)	(None, 1024)	0
dense_214 (Dense)	(None, 6272)	6428800
batch_normalization_104 (Batch Normalization)	(None, 6272)	25088
activation_426 (Activation)	(None, 6272)	0
reshape_104 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_207 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_213 (Conv2D)	(None, 14, 14, 64)	204864
activation_427 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_208 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_214 (Conv2D)	(None, 28, 28, 1)	1601
activation_428 (Activation)	(None, 28, 28, 1)	0
<hr/>		
Total params: 6 763 777		

Total params: 6,751,233  
Trainable params: 6,751,233  
Non-trainable params: 12,544

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batch 1 d\_loss : 0.183350  
batch 1 g\_loss : 2.140226  
batch 2 d\_loss : 0.158068  
batch 2 g\_loss : 2.151093  
batch 3 d\_loss : 0.138279  
batch 3 g\_loss : 2.155133  
batch 4 d\_loss : 0.185822  
batch 4 g\_loss : 2.176252  
batch 5 d\_loss : 0.164272  
batch 5 g\_loss : 2.166664  
batch 6 d\_loss : 0.192754  
batch 6 g\_loss : 2.182750  
batch 7 d\_loss : 0.186730  
batch 7 g\_loss : 2.214194  
batch 8 d\_loss : 0.181683  
batch 8 g\_loss : 2.208209  
batch 9 d\_loss : 0.164996  
batch 9 g\_loss : 2.199593  
batch 10 d\_loss : 0.195884  
batch 10 g\_loss : 2.210279  
batch 11 d\_loss : 0.174892  
batch 11 g\_loss : 2.227026  
batch 12 d\_loss : 0.188618  
batch 12 g\_loss : 2.250252  
batch 13 d\_loss : 0.161342  
batch 13 g\_loss : 2.247001  
batch 14 d\_loss : 0.179049  
batch 14 g\_loss : 2.272874  
batch 15 d\_loss : 0.189103  
batch 15 g\_loss : 2.268823  
batch 16 d\_loss : 0.173811  
batch 16 g\_loss : 2.285715  
batch 17 d\_loss : 0.148866  
batch 17 g\_loss : 2.266794  
batch 18 d\_loss : 0.179329  
batch 18 g\_loss : 2.283619  
batch 19 d\_loss : 0.159048  
batch 19 g\_loss : 2.314443  
batch 20 d\_loss : 0.152471  
batch 20 g\_loss : 2.323651  
batch 21 d\_loss : 0.172432  
batch 21 g\_loss : 2.314338  
batch 22 d\_loss : 0.164746  
batch 22 g\_loss : 2.326180  
batch 23 d\_loss : 0.152952  
batch 23 g\_loss : 2.327842  
batch 24 d\_loss : 0.144290  
batch 24 g\_loss : 2.357251  
batch 25 d\_loss : 0.188306  
batch 25 g\_loss : 2.387653

batch 26 d\_loss : 0.145162  
batch 26 g\_loss : 2.356244  
batch 27 d\_loss : 0.142348  
batch 27 g\_loss : 2.373536  
batch 28 d\_loss : 0.162378  
batch 28 g\_loss : 2.390339  
batch 29 d\_loss : 0.169742  
batch 29 g\_loss : 2.401108  
batch 30 d\_loss : 0.131858  
batch 30 g\_loss : 2.415469  
batch 31 d\_loss : 0.151378  
batch 31 g\_loss : 2.423229  
batch 32 d\_loss : 0.139048  
batch 32 g\_loss : 2.447478  
batch 33 d\_loss : 0.127023  
batch 33 g\_loss : 2.466706  
batch 34 d\_loss : 0.169684  
batch 34 g\_loss : 2.479992  
batch 35 d\_loss : 0.151277  
batch 35 g\_loss : 2.481900  
batch 36 d\_loss : 0.135128  
batch 36 g\_loss : 2.506490  
batch 37 d\_loss : 0.125764  
batch 37 g\_loss : 2.506398  
batch 38 d\_loss : 0.147020  
batch 38 g\_loss : 2.523470  
batch 39 d\_loss : 0.130959  
batch 39 g\_loss : 2.533320  
batch 40 d\_loss : 0.159261  
batch 40 g\_loss : 2.546274  
batch 41 d\_loss : 0.136886  
batch 41 g\_loss : 2.586199  
batch 42 d\_loss : 0.115481  
batch 42 g\_loss : 2.573309  
batch 43 d\_loss : 0.161380  
batch 43 g\_loss : 2.596781  
batch 44 d\_loss : 0.116314  
batch 44 g\_loss : 2.615809  
batch 45 d\_loss : 0.111744  
batch 45 g\_loss : 2.632810  
batch 46 d\_loss : 0.138930  
batch 46 g\_loss : 2.634495  
batch 47 d\_loss : 0.141635  
batch 47 g\_loss : 2.657718  
batch 48 d\_loss : 0.158700  
batch 48 g\_loss : 2.659617  
batch 49 d\_loss : 0.138580  
batch 49 g\_loss : 2.672576  
batch 50 d\_loss : 0.162812  
batch 50 g\_loss : 2.659719  
batch 51 d\_loss : 0.129384  
batch 51 g\_loss : 2.681174  
batch 52 d\_loss : 0.123608  
batch 52 g\_loss : 2.713722  
batch 53 d\_loss : 0.085579  
batch 53 g\_loss : 2.702117  
batch 54 d\_loss : 0.138167  
batch 54 g\_loss : 2.707915  
batch 55 d\_loss : 0.149648  
batch 55 g\_loss : 2.704941  
batch 56 d\_loss : 0.113833  
batch 56 g\_loss : 2.701304  
batch 57 d\_loss : 0.112692  
batch 57 g\_loss : 2.699989  
batch 58 d\_loss : 0.139129  
batch 58 g\_loss : 2.694495  
batch 59 d\_loss : 0.119246  
batch 59 g\_loss : 2.696347  
batch 60 d\_loss : 0.129051  
batch 60 g\_loss : 2.707226  
batch 61 d\_loss : 0.145519  
batch 61 g\_loss : 2.687344

batch 62 d\_loss : 0.193445  
batch 62 g\_loss : 2.697667  
batch 63 d\_loss : 0.118161  
batch 63 g\_loss : 2.681341  
batch 64 d\_loss : 0.116687  
batch 64 g\_loss : 2.669944  
batch 65 d\_loss : 0.124369  
batch 65 g\_loss : 2.655753  
batch 66 d\_loss : 0.169002  
batch 66 g\_loss : 2.658834  
batch 67 d\_loss : 0.126972  
batch 67 g\_loss : 2.678509  
batch 68 d\_loss : 0.173396  
batch 68 g\_loss : 2.641432  
batch 69 d\_loss : 0.160042  
batch 69 g\_loss : 2.633202  
batch 70 d\_loss : 0.157436  
batch 70 g\_loss : 2.598265  
batch 71 d\_loss : 0.120521  
batch 71 g\_loss : 2.581815  
batch 72 d\_loss : 0.176189  
batch 72 g\_loss : 2.571903  
batch 73 d\_loss : 0.142846  
batch 73 g\_loss : 2.568835  
batch 74 d\_loss : 0.131418  
batch 74 g\_loss : 2.542509  
batch 75 d\_loss : 0.201427  
batch 75 g\_loss : 2.543798  
batch 76 d\_loss : 0.150658  
batch 76 g\_loss : 2.542245  
batch 77 d\_loss : 0.153432  
batch 77 g\_loss : 2.530799  
batch 78 d\_loss : 0.192894  
batch 78 g\_loss : 2.490524  
batch 79 d\_loss : 0.150228  
batch 79 g\_loss : 2.510005  
batch 80 d\_loss : 0.181315  
batch 80 g\_loss : 2.468526  
batch 81 d\_loss : 0.191434  
batch 81 g\_loss : 2.457496  
batch 82 d\_loss : 0.190758  
batch 82 g\_loss : 2.451610  
batch 83 d\_loss : 0.151615  
batch 83 g\_loss : 2.486705  
batch 84 d\_loss : 0.164272  
batch 84 g\_loss : 2.439173  
batch 85 d\_loss : 0.204129  
batch 85 g\_loss : 2.439764  
batch 86 d\_loss : 0.149647  
batch 86 g\_loss : 2.444826  
batch 87 d\_loss : 0.176476  
batch 87 g\_loss : 2.450181  
batch 88 d\_loss : 0.163937  
batch 88 g\_loss : 2.460355  
batch 89 d\_loss : 0.150523  
batch 89 g\_loss : 2.482855  
batch 90 d\_loss : 0.158256  
batch 90 g\_loss : 2.515945  
batch 91 d\_loss : 0.162208  
batch 91 g\_loss : 2.508702  
batch 92 d\_loss : 0.202140  
batch 92 g\_loss : 2.553852  
batch 93 d\_loss : 0.143648  
batch 93 g\_loss : 2.538539  
batch 94 d\_loss : 0.181013  
batch 94 g\_loss : 2.572791  
batch 95 d\_loss : 0.138816  
batch 95 g\_loss : 2.597208  
batch 96 d\_loss : 0.169495  
batch 96 g\_loss : 2.629172  
batch 97 d\_loss : 0.145164  
batch 97 g\_loss : 2.638165

```

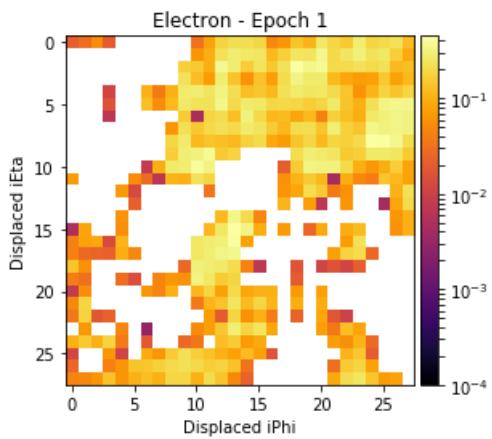
batch 98 d_loss : 0.118980
batch 98 g_loss : 2.718832
batch 99 d_loss : 0.148135
batch 99 g_loss : 2.728565
batch 100 d_loss : 0.119853
batch 100 g_loss : 2.742289
    set[disabled] .btn-link:focus {
        color: #777777;
        text-decoration: none;
    }
.btn-lg,
.
```

Layer (type)	Output Shape	Param #
dense_215 (Dense)	(None, 1024)	103424
activation_429 (Activation)	(None, 1024)	0
dense_216 (Dense)	(None, 6272)	6428800
batch_normalization_105 (Batch Normalization)	(None, 6272)	25088
activation_430 (Activation)	(None, 6272)	0
reshape_105 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_209 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_215 (Conv2D)	(None, 14, 14, 64)	204864
activation_431 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_210 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_216 (Conv2D)	(None, 28, 28, 1)	1601
activation_432 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544



batch 101 d\_loss : 0.158668

batch 101 g\_loss : 2.773090

batch 102 d\_loss : 0.114678

batch 102 g\_loss : 2.818997

batch 103 d\_loss : 0.123450

batch 103 g\_loss : 2.869286

batch 104 d\_loss : 0.117931

batch 104 g\_loss : 2.862882

batch 105 d\_loss : 0.128101

batch 105 g\_loss : 2.906234

batch 106 d\_loss : 0.103377

batch 106 g\_loss : 2.882401

```

batch 106 g_loss : 2.923404
batch 107 d_loss : 0.093380
batch 107 g_loss : 2.970318
batch 108 d_loss : 0.098739
batch 108 g_loss : 2.984101
batch 109 d_loss : 0.119767
batch 109 g_loss : 3.057716
batch 110 d_loss : 0.103670
batch 110 g_loss : 3.019597
batch 111 d_loss : 0.103540
batch 111 g_loss : 3.031992
batch 112 d_loss : 0.107166
batch 112 g_loss : 3.024732
batch 113 d_loss : 0.123473
batch 113 g_loss : 3.046285
batch 114 d_loss : 0.107303
batch 114 g_loss : 2.999356
batch 115 d_loss : 0.081289
batch 115 g_loss : 2.997092
batch 116 d_loss : 0.106351
batch 116 g_loss : 3.050657
batch 117 d_loss : 0.075095
batch 117 g_loss : 3.064234
batch 118 d_loss : 0.099733
batch 118 g_loss : 3.046147
batch 119 d_loss : 0.122959
batch 119 g_loss : 3.043188
batch 120 d_loss : 0.086886
batch 120 g_loss : 3.031767
batch 121 d_loss : 0.101834
batch 121 g_loss : 3.029952
batch 122 d_loss : 0.096793
batch 122 g_loss : 3.021026
batch 123 d_loss : 0.110144
batch 123 g_loss : 2.996445
batch 124 d_loss : 0.085241
batch 124 g_loss : 2.986417
batch 125 d_loss : 0.112976
batch 125 g_loss : 2.984982
batch 126 d_loss : 0.106138
batch 126 g_loss : 2.939927
batch 127 d_loss : 0.097848
batch 127 g_loss : 2.938588
batch 128 d_loss : 0.125160
batch 128 g_loss : 2.948684
batch 129 d_loss : 0.104627
batch 129 g_loss : 2.861938

```

Epoch is 2

Number of batches 130  
 batch 0 d\_loss : 0.064455  
 batch 0 g\_loss : 2.804839

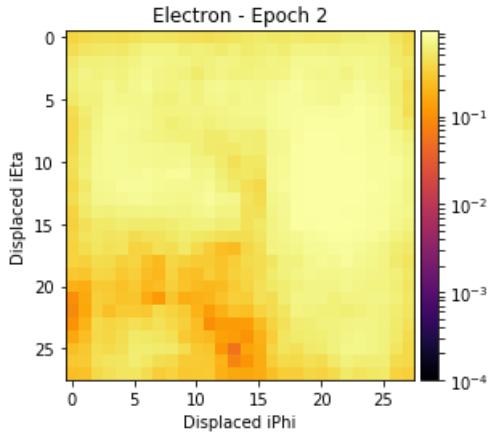
Layer (type)	Output Shape	Param #
dense_217 (Dense)	(None, 1024)	103424
activation_433 (Activation)	(None, 1024)	0
dense_218 (Dense)	(None, 6272)	6428800
batch_normalization_106 (Batch Normalization)	(None, 6272)	25088
activation_434 (Activation)	(None, 6272)	0
reshape_106 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_211 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_217 (Conv2D)	(None, 14, 14, 64)	204864
activation_435 (Activation)	(None, 14, 14, 64)	0
-----	-----	-----

```

up_samppling2a_212 (upsampling (None, 28, 28, 64)           u
conv2d_218 (Conv2D)          (None, 28, 28, 1)           1601
activation_436 (Activation)  (None, 28, 28, 1)           0
=====
Total params: 6,763,777
Trainable params: 6,751,233
Non-trainable params: 12,544

```

---



```

batch 1 d_loss : 0.130774
batch 1 g_loss : 2.890218
batch 2 d_loss : 0.094152
batch 2 g_loss : 2.841485
batch 3 d_loss : 0.067237
batch 3 g_loss : 2.849823
batch 4 d_loss : 0.140882
batch 4 g_loss : 2.883921
batch 5 d_loss : 0.107227
batch 5 g_loss : 2.810525
batch 6 d_loss : 0.151400
batch 6 g_loss : 2.748802
batch 7 d_loss : 0.146148
batch 7 g_loss : 2.700275
batch 8 d_loss : 0.142202
batch 8 g_loss : 2.767657
batch 9 d_loss : 0.124295
batch 9 g_loss : 2.703947
batch 10 d_loss : 0.171088
batch 10 g_loss : 2.726151
batch 11 d_loss : 0.141186
batch 11 g_loss : 2.695578
batch 12 d_loss : 0.160554
batch 12 g_loss : 2.633399
batch 13 d_loss : 0.126172
batch 13 g_loss : 2.657564
batch 14 d_loss : 0.172757
batch 14 g_loss : 2.558937
batch 15 d_loss : 0.171788
batch 15 g_loss : 2.593030
batch 16 d_loss : 0.167548
batch 16 g_loss : 2.634388
batch 17 d_loss : 0.133629
batch 17 g_loss : 2.593930
batch 18 d_loss : 0.178489
batch 18 g_loss : 2.572765
batch 19 d_loss : 0.152571
batch 19 g_loss : 2.595088
batch 20 d_loss : 0.140637
batch 20 g_loss : 2.507258
batch 21 d_loss : 0.184536
batch 21 g_loss : 2.543832
batch 22 d_loss : 0.169328
batch 22 g_loss : 2.483567

```

```
.....
batch 23 d_loss : 0.154766
batch 23 g_loss : 2.483081
batch 24 d_loss : 0.149147
batch 24 g_loss : 2.476688
batch 25 d_loss : 0.208157
batch 25 g_loss : 2.522794
batch 26 d_loss : 0.141542
batch 26 g_loss : 2.503898
batch 27 d_loss : 0.147742
batch 27 g_loss : 2.522892
batch 28 d_loss : 0.188183
batch 28 g_loss : 2.481739
batch 29 d_loss : 0.187540
batch 29 g_loss : 2.512433
batch 30 d_loss : 0.148050
batch 30 g_loss : 2.483580
batch 31 d_loss : 0.179573
batch 31 g_loss : 2.485177
batch 32 d_loss : 0.160904
batch 32 g_loss : 2.513696
batch 33 d_loss : 0.146338
batch 33 g_loss : 2.534874
batch 34 d_loss : 0.188374
batch 34 g_loss : 2.520414
batch 35 d_loss : 0.167575
batch 35 g_loss : 2.525215
batch 36 d_loss : 0.149895
batch 36 g_loss : 2.580841
batch 37 d_loss : 0.134760
batch 37 g_loss : 2.554194
batch 38 d_loss : 0.156524
batch 38 g_loss : 2.608804
batch 39 d_loss : 0.137934
batch 39 g_loss : 2.631064
batch 40 d_loss : 0.170429
batch 40 g_loss : 2.618901
batch 41 d_loss : 0.144464
batch 41 g_loss : 2.642709
batch 42 d_loss : 0.114529
batch 42 g_loss : 2.680610
batch 43 d_loss : 0.173786
batch 43 g_loss : 2.647235
batch 44 d_loss : 0.111582
batch 44 g_loss : 2.692213
batch 45 d_loss : 0.103106
batch 45 g_loss : 2.713080
batch 46 d_loss : 0.140461
batch 46 g_loss : 2.718445
batch 47 d_loss : 0.144340
batch 47 g_loss : 2.751941
batch 48 d_loss : 0.166138
batch 48 g_loss : 2.769991
batch 49 d_loss : 0.137550
batch 49 g_loss : 2.795876
batch 50 d_loss : 0.169986
batch 50 g_loss : 2.823403
batch 51 d_loss : 0.124938
batch 51 g_loss : 2.790771
batch 52 d_loss : 0.116678
batch 52 g_loss : 2.833375
batch 53 d_loss : 0.067310
batch 53 g_loss : 2.852370
batch 54 d_loss : 0.135450
batch 54 g_loss : 2.826274
batch 55 d_loss : 0.149415
batch 55 g_loss : 2.832164
batch 56 d_loss : 0.102255
batch 56 g_loss : 2.834325
batch 57 d_loss : 0.099994
batch 57 g_loss : 2.865865
batch 58 d_loss : 0.132572
batch 58 q_loss : 2.804947
```

batch 59 d\_loss : 0.107743  
batch 59 g\_loss : 2.888463  
batch 60 d\_loss : 0.120967  
batch 60 g\_loss : 2.868119  
batch 61 d\_loss : 0.138693  
batch 61 g\_loss : 2.853391  
batch 62 d\_loss : 0.199009  
batch 62 g\_loss : 2.862609  
batch 63 d\_loss : 0.102382  
batch 63 g\_loss : 2.841563  
batch 64 d\_loss : 0.101726  
batch 64 g\_loss : 2.795347  
batch 65 d\_loss : 0.109746  
batch 65 g\_loss : 2.872804  
batch 66 d\_loss : 0.162878  
batch 66 g\_loss : 2.790438  
batch 67 d\_loss : 0.108688  
batch 67 g\_loss : 2.824995  
batch 68 d\_loss : 0.165795  
batch 68 g\_loss : 2.845410  
batch 69 d\_loss : 0.143849  
batch 69 g\_loss : 2.783130  
batch 70 d\_loss : 0.138086  
batch 70 g\_loss : 2.798398  
batch 71 d\_loss : 0.096040  
batch 71 g\_loss : 2.740820  
batch 72 d\_loss : 0.160450  
batch 72 g\_loss : 2.701812  
batch 73 d\_loss : 0.117434  
batch 73 g\_loss : 2.728706  
batch 74 d\_loss : 0.101137  
batch 74 g\_loss : 2.756757  
batch 75 d\_loss : 0.184835  
batch 75 g\_loss : 2.716591  
batch 76 d\_loss : 0.122309  
batch 76 g\_loss : 2.664048  
batch 77 d\_loss : 0.122607  
batch 77 g\_loss : 2.684529  
batch 78 d\_loss : 0.167096  
batch 78 g\_loss : 2.706055  
batch 79 d\_loss : 0.114575  
batch 79 g\_loss : 2.671146  
batch 80 d\_loss : 0.142497  
batch 80 g\_loss : 2.631180  
batch 81 d\_loss : 0.160236  
batch 81 g\_loss : 2.599202  
batch 82 d\_loss : 0.151469  
batch 82 g\_loss : 2.614549  
batch 83 d\_loss : 0.112496  
batch 83 g\_loss : 2.576845  
batch 84 d\_loss : 0.123932  
batch 84 g\_loss : 2.522180  
batch 85 d\_loss : 0.170369  
batch 85 g\_loss : 2.585407  
batch 86 d\_loss : 0.110039  
batch 86 g\_loss : 2.543390  
batch 87 d\_loss : 0.145544  
batch 87 g\_loss : 2.591294  
batch 88 d\_loss : 0.122888  
batch 88 g\_loss : 2.583361  
batch 89 d\_loss : 0.112546  
batch 89 g\_loss : 2.572613  
batch 90 d\_loss : 0.122553  
batch 90 g\_loss : 2.512786  
batch 91 d\_loss : 0.134213  
batch 91 g\_loss : 2.494522  
batch 92 d\_loss : 0.180663  
batch 92 g\_loss : 2.444217  
batch 93 d\_loss : 0.117778  
batch 93 g\_loss : 2.494078  
batch 94 d\_loss : 0.167945  
batch 94 q\_loss : 2.504207

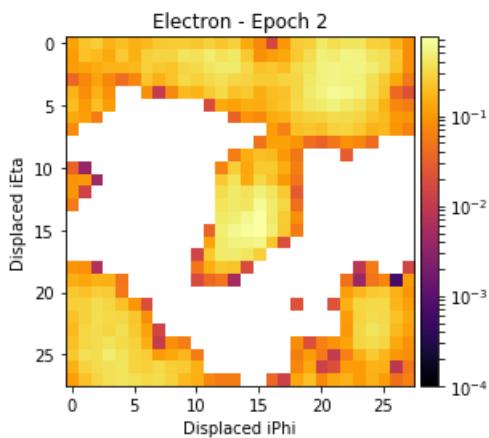
```

batch 95 d_loss : 0.122415
batch 95 g_loss : 2.452263
batch 96 d_loss : 0.163730
batch 96 g_loss : 2.504819
batch 97 d_loss : 0.134160
batch 97 g_loss : 2.484351
batch 98 d_loss : 0.112086
batch 98 g_loss : 2.550415
batch 99 d_loss : 0.146647
batch 99 g_loss : 2.444191
batch 100 d_loss : 0.121154
batch 100 g_loss : 2.503953

```

Layer (type)	Output Shape	Param #
dense_219 (Dense)	(None, 1024)	103424
activation_437 (Activation)	(None, 1024)	0
dense_220 (Dense)	(None, 6272)	6428800
batch_normalization_107 (Batch Normalization)	(None, 6272)	25088
activation_438 (Activation)	(None, 6272)	0
reshape_107 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_213 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_219 (Conv2D)	(None, 14, 14, 64)	204864
activation_439 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_214 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_220 (Conv2D)	(None, 28, 28, 1)	1601
activation_440 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 101 d_loss : 0.166167
batch 101 g_loss : 2.457341
batch 102 d_loss : 0.119071
batch 102 g_loss : 2.526573
batch 103 d_loss : 0.135744
batch 103 g_loss : 2.473914
batch 104 d_loss : 0.129634
batch 104 g_loss : 2.495182
batch 105 d_loss : 0.145143
batch 105 g_loss : 2.457690

```

batch 106 d\_loss : 0.115598  
 batch 106 g\_loss : 2.476907  
 batch 107 d\_loss : 0.106930  
 batch 107 g\_loss : 2.506543  
 batch 108 d\_loss : 0.116112  
 batch 108 g\_loss : 2.470680  
 batch 109 d\_loss : 0.137179  
 batch 109 g\_loss : 2.523250  
 batch 110 d\_loss : 0.122512  
 batch 110 g\_loss : 2.473801  
 batch 111 d\_loss : 0.121947  
 batch 111 g\_loss : 2.547158  
 batch 112 d\_loss : 0.124095  
 batch 112 g\_loss : 2.534112  
 batch 113 d\_loss : 0.144442  
 batch 113 g\_loss : 2.529874  
 batch 114 d\_loss : 0.128128  
 batch 114 g\_loss : 2.499372  
 batch 115 d\_loss : 0.099237  
 batch 115 g\_loss : 2.526748  
 batch 116 d\_loss : 0.126199  
 batch 116 g\_loss : 2.579593  
 batch 117 d\_loss : 0.090760  
 batch 117 g\_loss : 2.544679  
 batch 118 d\_loss : 0.118887  
 batch 118 g\_loss : 2.559756  
 batch 119 d\_loss : 0.144212  
 batch 119 g\_loss : 2.570176  
 batch 120 d\_loss : 0.105243  
 batch 120 g\_loss : 2.518527  
 batch 121 d\_loss : 0.119066  
 batch 121 g\_loss : 2.547766  
 batch 122 d\_loss : 0.112061  
 batch 122 g\_loss : 2.577755  
 batch 123 d\_loss : 0.127839  
 batch 123 g\_loss : 2.608531  
 batch 124 d\_loss : 0.102322  
 batch 124 g\_loss : 2.560750  
 batch 125 d\_loss : 0.127928  
 batch 125 g\_loss : 2.538604  
 batch 126 d\_loss : 0.122236  
 batch 126 g\_loss : 2.525616  
 batch 127 d\_loss : 0.111158  
 batch 127 g\_loss : 2.559402  
 batch 128 d\_loss : 0.140158  
 batch 128 g\_loss : 2.533702  
 batch 129 d\_loss : 0.114385  
 batch 129 g\_loss : 2.542794

Epoch is 3

Number of batches 130  
 batch 0 d\_loss : 0.072197  
 batch 0 g\_loss : 2.600592

Layer (type)	Output Shape	Param #
dense_221 (Dense)	(None, 1024)	103424
activation_441 (Activation)	(None, 1024)	0
dense_222 (Dense)	(None, 6272)	6428800
batch_normalization_108 (Batch Normalization)	(None, 6272)	25088
activation_442 (Activation)	(None, 6272)	0
reshape_108 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_215 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_221 (Conv2D)	(None, 14, 14, 64)	204864
activation_443 (Activation)	(None, 14, 14, 64)	0

up_sampling2d_216	(UpSampling2D)	(None, 28, 28, 64)	0
conv2d_222	(Conv2D)	(None, 28, 28, 1)	1601
activation_444	(Activation)	(None, 28, 28, 1)	0
=====			
Total params: 6,763,777			
Trainable params: 6,751,233			
Non-trainable params: 12,544			

batch 1 d\_loss : 0.139025  
batch 1 g\_loss : 2.539863  
batch 2 d\_loss : 0.100490  
batch 2 g\_loss : 2.537777  
batch 3 d\_loss : 0.066346  
batch 3 g\_loss : 2.516101  
batch 4 d\_loss : 0.145157  
batch 4 g\_loss : 2.539864  
batch 5 d\_loss : 0.110640  
batch 5 g\_loss : 2.571383  
batch 6 d\_loss : 0.156810  
batch 6 g\_loss : 2.583816  
batch 7 d\_loss : 0.152416  
batch 7 g\_loss : 2.578589  
batch 8 d\_loss : 0.144595  
batch 8 g\_loss : 2.540283  
batch 9 d\_loss : 0.120077  
batch 9 g\_loss : 2.538972  
batch 10 d\_loss : 0.171574  
batch 10 g\_loss : 2.538954  
batch 11 d\_loss : 0.134954  
batch 11 g\_loss : 2.511650  
batch 12 d\_loss : 0.153617  
batch 12 g\_loss : 2.502509  
batch 13 d\_loss : 0.113446  
batch 13 g\_loss : 2.564521  
batch 14 d\_loss : 0.136406  
batch 14 g\_loss : 2.553401  
batch 15 d\_loss : 0.153967  
batch 15 g\_loss : 2.567075  
batch 16 d\_loss : 0.141740  
batch 16 g\_loss : 2.502486  
batch 17 d\_loss : 0.101883  
batch 17 g\_loss : 2.523481  
batch 18 d\_loss : 0.142319  
batch 18 g\_loss : 2.543636  
batch 19 d\_loss : 0.113927  
batch 19 g\_loss : 2.560701  
batch 20 d\_loss : 0.104689  
batch 20 g\_loss : 2.481096  
batch 21 d\_loss : 0.142463  
batch 21 g\_loss : 2.443978  
batch 22 d\_loss : 0.120930

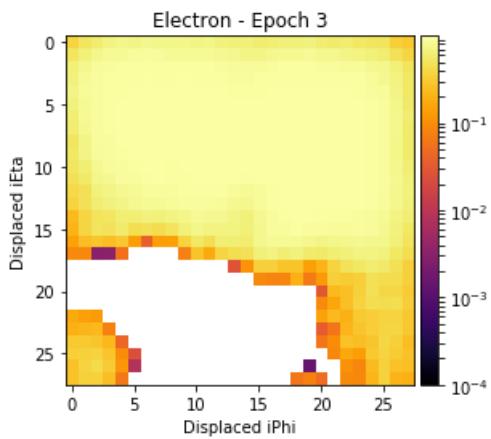
batch 22 g\_loss : 2.438820  
batch 22 d\_loss : 0.110454  
batch 23 g\_loss : 2.482183  
batch 23 d\_loss : 0.101966  
batch 24 g\_loss : 2.421317  
batch 24 d\_loss : 0.163895  
batch 25 g\_loss : 2.466790  
batch 25 d\_loss : 0.107623  
batch 26 g\_loss : 2.428717  
batch 27 d\_loss : 0.103061  
batch 27 g\_loss : 2.500859  
batch 28 d\_loss : 0.129088  
batch 28 g\_loss : 2.399760  
batch 29 d\_loss : 0.142245  
batch 29 g\_loss : 2.499171  
batch 30 d\_loss : 0.089229  
batch 30 g\_loss : 2.423160  
batch 31 d\_loss : 0.117287  
batch 31 g\_loss : 2.456269  
batch 32 d\_loss : 0.104730  
batch 32 g\_loss : 2.399709  
batch 33 d\_loss : 0.089832  
batch 33 g\_loss : 2.410017  
batch 34 d\_loss : 0.150179  
batch 34 g\_loss : 2.417917  
batch 35 d\_loss : 0.122321  
batch 35 g\_loss : 2.447034  
batch 36 d\_loss : 0.106948  
batch 36 g\_loss : 2.439804  
batch 37 d\_loss : 0.095021  
batch 37 g\_loss : 2.399889  
batch 38 d\_loss : 0.125328  
batch 38 g\_loss : 2.390979  
batch 39 d\_loss : 0.104315  
batch 39 g\_loss : 2.411801  
batch 40 d\_loss : 0.145441  
batch 40 g\_loss : 2.396605  
batch 41 d\_loss : 0.116512  
batch 41 g\_loss : 2.469855  
batch 42 d\_loss : 0.092876  
batch 42 g\_loss : 2.400448  
batch 43 d\_loss : 0.151917  
batch 43 g\_loss : 2.374072  
batch 44 d\_loss : 0.092668  
batch 44 g\_loss : 2.414002  
batch 45 d\_loss : 0.086873  
batch 45 g\_loss : 2.408405  
batch 46 d\_loss : 0.127135  
batch 46 g\_loss : 2.421850  
batch 47 d\_loss : 0.131299  
batch 47 g\_loss : 2.435051  
batch 48 d\_loss : 0.155178  
batch 48 g\_loss : 2.398091  
batch 49 d\_loss : 0.131701  
batch 49 g\_loss : 2.360573  
batch 50 d\_loss : 0.157680  
batch 50 g\_loss : 2.420452  
batch 51 d\_loss : 0.119245  
batch 51 g\_loss : 2.431909  
batch 52 d\_loss : 0.111113  
batch 52 g\_loss : 2.376588  
batch 53 d\_loss : 0.063952  
batch 53 g\_loss : 2.411981  
batch 54 d\_loss : 0.132161  
batch 54 g\_loss : 2.410281  
batch 55 d\_loss : 0.146231  
batch 55 g\_loss : 2.408355  
batch 56 d\_loss : 0.103359  
batch 56 g\_loss : 2.351735  
batch 57 d\_loss : 0.099433  
batch 57 g\_loss : 2.353636  
batch 58 d\_loss : 0.132981

```
batch 57 g_loss : 2.436574
batch 58 g_loss : 0.107371
batch 59 g_loss : 2.375390
batch 60 g_loss : 0.123309
batch 60 g_loss : 2.405380
batch 61 g_loss : 0.139567
batch 61 g_loss : 2.335797
batch 62 g_loss : 0.195980
batch 62 g_loss : 2.374229
batch 63 g_loss : 0.104168
batch 63 g_loss : 2.328144
batch 64 g_loss : 0.102156
batch 64 g_loss : 2.351163
batch 65 g_loss : 0.109624
batch 65 g_loss : 2.442868
batch 66 g_loss : 0.163331
batch 66 g_loss : 2.402824
batch 67 g_loss : 0.107790
batch 67 g_loss : 2.323217
batch 68 g_loss : 0.163899
batch 68 g_loss : 2.348665
batch 69 g_loss : 0.148247
batch 69 g_loss : 2.374517
batch 70 g_loss : 0.138706
batch 70 g_loss : 2.315407
batch 71 g_loss : 0.093625
batch 71 g_loss : 2.332232
batch 72 g_loss : 0.159342
batch 72 g_loss : 2.324220
batch 73 g_loss : 0.118367
batch 73 g_loss : 2.270072
batch 74 g_loss : 0.100367
batch 74 g_loss : 2.226974
batch 75 g_loss : 0.178688
batch 75 g_loss : 2.353316
batch 76 g_loss : 0.119169
batch 76 g_loss : 2.298782
batch 77 g_loss : 0.117731
batch 77 g_loss : 2.221074
batch 78 g_loss : 0.159195
batch 78 g_loss : 2.322213
batch 79 g_loss : 0.109579
batch 79 g_loss : 2.401063
batch 80 g_loss : 0.137282
batch 80 g_loss : 2.303831
batch 81 g_loss : 0.149053
batch 81 g_loss : 2.351743
batch 82 g_loss : 0.141944
batch 82 g_loss : 2.266947
batch 83 g_loss : 0.103272
batch 83 g_loss : 2.307836
batch 84 g_loss : 0.111410
batch 84 g_loss : 2.248118
batch 85 g_loss : 0.156801
batch 85 g_loss : 2.244805
batch 86 g_loss : 0.099879
batch 86 g_loss : 2.306307
batch 87 g_loss : 0.127994
batch 87 g_loss : 2.194124
batch 88 g_loss : 0.113083
batch 88 g_loss : 2.248126
batch 89 g_loss : 0.097782
batch 89 g_loss : 2.239729
batch 90 g_loss : 0.110229
batch 90 g_loss : 2.305064
batch 91 g_loss : 0.119356
batch 91 g_loss : 2.210763
batch 92 g_loss : 0.158990
batch 92 g_loss : 2.328892
batch 93 g_loss : 0.102799
batch 93 g_loss : 2.272702
batch 94 g_loss : 0.147289
```

```
batch 94 g_loss : 2.257980
batch 95 d_loss : 0.105737
batch 95 g_loss : 2.263113
batch 96 d_loss : 0.142682
batch 96 g_loss : 2.310242
batch 97 d_loss : 0.117281
batch 97 g_loss : 2.275440
batch 98 d_loss : 0.095448
batch 98 g_loss : 2.254960
batch 99 d_loss : 0.131394
batch 99 g_loss : 2.335559
batch 100 d_loss : 0.102797
batch 100 g_loss : 2.264997
```

Layer (type)	Output Shape	Param #
dense_223 (Dense)	(None, 1024)	103424
activation_445 (Activation)	(None, 1024)	0
dense_224 (Dense)	(None, 6272)	6428800
batch_normalization_109 (Batch Normalization)	(None, 6272)	25088
activation_446 (Activation)	(None, 6272)	0
reshape_109 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_217 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_223 (Conv2D)	(None, 14, 14, 64)	204864
activation_447 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_218 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_224 (Conv2D)	(None, 28, 28, 1)	1601
activation_448 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```
batch 101 d_loss : 0.145714
batch 101 g_loss : 2.308123
batch 102 d_loss : 0.104573
batch 102 g_loss : 2.254033
batch 103 d_loss : 0.116742
batch 103 g_loss : 2.228580
batch 104 d_loss : 0.114658
batch 104 g_loss : 2.243955
batch 105 d_loss : 0.129056
```

batch 105 g\_loss : 2.285170  
 batch 106 d\_loss : 0.104629  
 batch 106 g\_loss : 2.309533  
 batch 107 d\_loss : 0.097141  
 batch 107 g\_loss : 2.204585  
 batch 108 d\_loss : 0.103240  
 batch 108 g\_loss : 2.280078  
 batch 109 d\_loss : 0.124612  
 batch 109 g\_loss : 2.232810  
 batch 110 d\_loss : 0.112170  
 batch 110 g\_loss : 2.238082  
 batch 111 d\_loss : 0.111684  
 batch 111 g\_loss : 2.276325  
 batch 112 d\_loss : 0.118111  
 batch 112 g\_loss : 2.223258  
 batch 113 d\_loss : 0.139082  
 batch 113 g\_loss : 2.214452  
 batch 114 d\_loss : 0.119037  
 batch 114 g\_loss : 2.255293  
 batch 115 d\_loss : 0.095739  
 batch 115 g\_loss : 2.253011  
 batch 116 d\_loss : 0.124833  
 batch 116 g\_loss : 2.231702  
 batch 117 d\_loss : 0.087734  
 batch 117 g\_loss : 2.225402  
 batch 118 d\_loss : 0.117758  
 batch 118 g\_loss : 2.278860  
 batch 119 d\_loss : 0.140515  
 batch 119 g\_loss : 2.277707  
 batch 120 d\_loss : 0.104457  
 batch 120 g\_loss : 2.251980  
 batch 121 d\_loss : 0.119820  
 batch 121 g\_loss : 2.251075  
 batch 122 d\_loss : 0.114465  
 batch 122 g\_loss : 2.214754  
 batch 123 d\_loss : 0.128931  
 batch 123 g\_loss : 2.266535  
 batch 124 d\_loss : 0.104047  
 batch 124 g\_loss : 2.227788  
 batch 125 d\_loss : 0.124238  
 batch 125 g\_loss : 2.214218  
 batch 126 d\_loss : 0.123411  
 batch 126 g\_loss : 2.299772  
 batch 127 d\_loss : 0.114269  
 batch 127 g\_loss : 2.223233  
 batch 128 d\_loss : 0.143191  
 batch 128 g\_loss : 2.244812  
 batch 129 d\_loss : 0.117232  
 batch 129 g\_loss : 2.280448

Epoch is 4

Number of batches 130  
 batch 0 d\_loss : 0.078765  
 batch 0 g\_loss : 2.372318

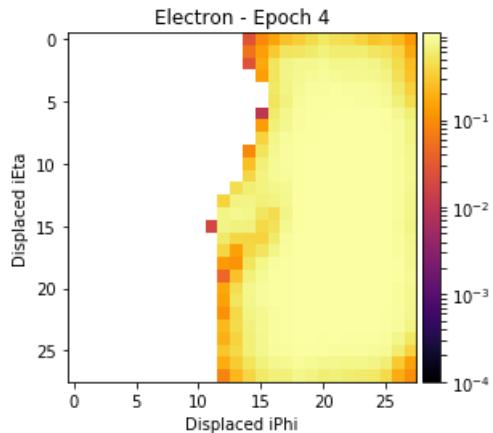
Layer (type)	Output Shape	Param #
dense_225 (Dense)	(None, 1024)	103424
activation_449 (Activation)	(None, 1024)	0
dense_226 (Dense)	(None, 6272)	6428800
batch_normalization_110 (Batch Normalization)	(None, 6272)	25088
activation_450 (Activation)	(None, 6272)	0
reshape_110 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_219 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_225 (Conv2D)	(None, 14, 14, 64)	204864

activation_451 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_220 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_226 (Conv2D)	(None, 28, 28, 1)	1601
activation_452 (Activation)	(None, 28, 28, 1)	0

---

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544

---



```

batch 1 d_loss : 0.140414
batch 1 g_loss : 2.282057
batch 2 d_loss : 0.104519
batch 2 g_loss : 2.260216
batch 3 d_loss : 0.072577
batch 3 g_loss : 2.231678
batch 4 d_loss : 0.149744
batch 4 g_loss : 2.358387
batch 5 d_loss : 0.114951
batch 5 g_loss : 2.288988
batch 6 d_loss : 0.160032
batch 6 g_loss : 2.302117
batch 7 d_loss : 0.152803
batch 7 g_loss : 2.328346
batch 8 d_loss : 0.144658
batch 8 g_loss : 2.233099
batch 9 d_loss : 0.122608
batch 9 g_loss : 2.229904
batch 10 d_loss : 0.174878
batch 10 g_loss : 2.329171
batch 11 d_loss : 0.139708
batch 11 g_loss : 2.263995
batch 12 d_loss : 0.156691
batch 12 g_loss : 2.252508
batch 13 d_loss : 0.115491
batch 13 g_loss : 2.276248
batch 14 d_loss : 0.139015
batch 14 g_loss : 2.286699
batch 15 d_loss : 0.161131
batch 15 g_loss : 2.320043
batch 16 d_loss : 0.139768
batch 16 g_loss : 2.227416
batch 17 d_loss : 0.104276
batch 17 g_loss : 2.259672
batch 18 d_loss : 0.148011
batch 18 g_loss : 2.307647
batch 19 d_loss : 0.120115
batch 19 g_loss : 2.250315
batch 20 d_loss : 0.108368
batch 20 g_loss : 2.380594
batch 21 d_loss : 0.140157
batch 21 g_loss : 2.148182

```

```
batch 21 g_loss : 2.140402
batch 22 d_loss : 0.128890
batch 22 g_loss : 2.209921
batch 23 d_loss : 0.114276
batch 23 g_loss : 2.323920
batch 24 d_loss : 0.106196
batch 24 g_loss : 2.295896
batch 25 d_loss : 0.168409
batch 25 g_loss : 2.247812
batch 26 d_loss : 0.107928
batch 26 g_loss : 2.244405
batch 27 d_loss : 0.107897
batch 27 g_loss : 2.284602
batch 28 d_loss : 0.135206
batch 28 g_loss : 2.287677
batch 29 d_loss : 0.148691
batch 29 g_loss : 2.266017
batch 30 d_loss : 0.095292
batch 30 g_loss : 2.327438
batch 31 d_loss : 0.122922
batch 31 g_loss : 2.293363
batch 32 d_loss : 0.108024
batch 32 g_loss : 2.250314
batch 33 d_loss : 0.096187
batch 33 g_loss : 2.257784
batch 34 d_loss : 0.152273
batch 34 g_loss : 2.241656
batch 35 d_loss : 0.130144
batch 35 g_loss : 2.285256
batch 36 d_loss : 0.111408
batch 36 g_loss : 2.266507
batch 37 d_loss : 0.099284
batch 37 g_loss : 2.268706
batch 38 d_loss : 0.129668
batch 38 g_loss : 2.240490
batch 39 d_loss : 0.109591
batch 39 g_loss : 2.319133
batch 40 d_loss : 0.150786
batch 40 g_loss : 2.281616
batch 41 d_loss : 0.124401
batch 41 g_loss : 2.306892
batch 42 d_loss : 0.096600
batch 42 g_loss : 2.245643
batch 43 d_loss : 0.157774
batch 43 g_loss : 2.278302
batch 44 d_loss : 0.102243
batch 44 g_loss : 2.335804
batch 45 d_loss : 0.094619
batch 45 g_loss : 2.279196
batch 46 d_loss : 0.136273
batch 46 g_loss : 2.252230
batch 47 d_loss : 0.136710
batch 47 g_loss : 2.346884
batch 48 d_loss : 0.162959
batch 48 g_loss : 2.302257
batch 49 d_loss : 0.135561
batch 49 g_loss : 2.274949
batch 50 d_loss : 0.169812
batch 50 g_loss : 2.282249
batch 51 d_loss : 0.123776
batch 51 g_loss : 2.288896
batch 52 d_loss : 0.118077
batch 52 g_loss : 2.285203
batch 53 d_loss : 0.070628
batch 53 g_loss : 2.307423
batch 54 d_loss : 0.138648
batch 54 g_loss : 2.324285
batch 55 d_loss : 0.152385
batch 55 g_loss : 2.282719
batch 56 d_loss : 0.110492
batch 56 g_loss : 2.311702
batch 57 d_loss : 0.107485
batch 57 g_loss : 2.282607
```

batch 57 g\_loss : 2.20200  
batch 58 d\_loss : 0.142318  
batch 58 g\_loss : 2.366508  
batch 59 d\_loss : 0.118878  
batch 59 g\_loss : 2.285402  
batch 60 d\_loss : 0.130738  
batch 60 g\_loss : 2.364109  
batch 61 d\_loss : 0.147521  
batch 61 g\_loss : 2.340603  
batch 62 d\_loss : 0.205622  
batch 62 g\_loss : 2.268128  
batch 63 d\_loss : 0.112134  
batch 63 g\_loss : 2.370400  
batch 64 d\_loss : 0.111880  
batch 64 g\_loss : 2.379008  
batch 65 d\_loss : 0.119192  
batch 65 g\_loss : 2.347222  
batch 66 d\_loss : 0.171989  
batch 66 g\_loss : 2.440084  
batch 67 d\_loss : 0.119886  
batch 67 g\_loss : 2.363572  
batch 68 d\_loss : 0.174421  
batch 68 g\_loss : 2.312942  
batch 69 d\_loss : 0.157170  
batch 69 g\_loss : 2.408321  
batch 70 d\_loss : 0.147685  
batch 70 g\_loss : 2.297384  
batch 71 d\_loss : 0.103912  
batch 71 g\_loss : 2.346647  
batch 72 d\_loss : 0.170424  
batch 72 g\_loss : 2.343278  
batch 73 d\_loss : 0.128667  
batch 73 g\_loss : 2.227910  
batch 74 d\_loss : 0.106199  
batch 74 g\_loss : 2.361072  
batch 75 d\_loss : 0.188946  
batch 75 g\_loss : 2.272627  
batch 76 d\_loss : 0.128475  
batch 76 g\_loss : 2.330982  
batch 77 d\_loss : 0.127228  
batch 77 g\_loss : 2.312757  
batch 78 d\_loss : 0.169498  
batch 78 g\_loss : 2.308840  
batch 79 d\_loss : 0.118735  
batch 79 g\_loss : 2.310338  
batch 80 d\_loss : 0.146997  
batch 80 g\_loss : 2.283790  
batch 81 d\_loss : 0.159992  
batch 81 g\_loss : 2.347801  
batch 82 d\_loss : 0.154172  
batch 82 g\_loss : 2.367186  
batch 83 d\_loss : 0.108980  
batch 83 g\_loss : 2.359101  
batch 84 d\_loss : 0.120645  
batch 84 g\_loss : 2.242662  
batch 85 d\_loss : 0.167547  
batch 85 g\_loss : 2.250760  
batch 86 d\_loss : 0.108309  
batch 86 g\_loss : 2.337423  
batch 87 d\_loss : 0.134450  
batch 87 g\_loss : 2.349366  
batch 88 d\_loss : 0.120175  
batch 88 g\_loss : 2.312332  
batch 89 d\_loss : 0.103643  
batch 89 g\_loss : 2.296218  
batch 90 d\_loss : 0.117776  
batch 90 g\_loss : 2.231511  
batch 91 d\_loss : 0.126686  
batch 91 g\_loss : 2.318585  
batch 92 d\_loss : 0.173402  
batch 92 g\_loss : 2.397776  
batch 93 d\_loss : 0.109150  
batch 93 g\_loss : 2.408337

```

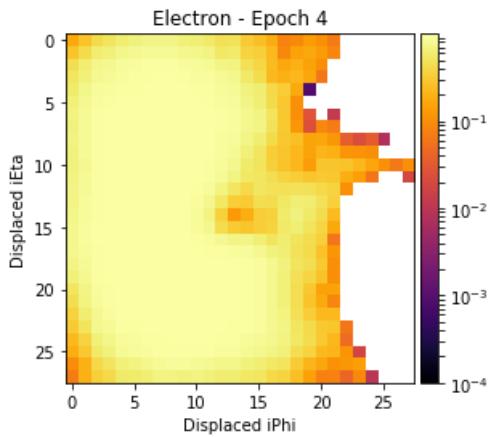
batch 93 g_loss : 2.10000,
batch 94 d_loss : 0.156225
batch 94 g_loss : 2.292397
batch 95 d_loss : 0.111776
batch 95 g_loss : 2.355314
batch 96 d_loss : 0.152081
batch 96 g_loss : 2.314218
batch 97 d_loss : 0.125848
batch 97 g_loss : 2.362283
batch 98 d_loss : 0.103810
batch 98 g_loss : 2.376702
batch 99 d_loss : 0.135841
batch 99 g_loss : 2.286754
batch 100 d_loss : 0.111558
batch 100 g_loss : 2.356776

```

Layer (type)	Output Shape	Param #
<hr/>		
dense_227 (Dense)	(None, 1024)	103424
activation_453 (Activation)	(None, 1024)	0
dense_228 (Dense)	(None, 6272)	6428800
batch_normalization_111 (Batch Normalization)	(None, 6272)	25088
activation_454 (Activation)	(None, 6272)	0
reshape_111 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_221 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_227 (Conv2D)	(None, 14, 14, 64)	204864
activation_455 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_222 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_228 (Conv2D)	(None, 28, 28, 1)	1601
activation_456 (Activation)	(None, 28, 28, 1)	0
<hr/>		

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544

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```

batch 101 d_loss : 0.153860
batch 101 g_loss : 2.384713
batch 102 d_loss : 0.110627
batch 102 g_loss : 2.291136
batch 103 d_loss : 0.126229
batch 103 g_loss : 2.323567
batch 104 d_loss : 0.123391
batch 104 g_loss : 2.386663

```

```

batch 105 d_loss : 0.134479
batch 105 g_loss : 2.363959
batch 106 d_loss : 0.110870
batch 106 g_loss : 2.435302
batch 107 d_loss : 0.103577
batch 107 g_loss : 2.464197
batch 108 d_loss : 0.111905
batch 108 g_loss : 2.370594
batch 109 d_loss : 0.135202
batch 109 g_loss : 2.365113
batch 110 d_loss : 0.119125
batch 110 g_loss : 2.378818
batch 111 d_loss : 0.117607
batch 111 g_loss : 2.374858
batch 112 d_loss : 0.123514
batch 112 g_loss : 2.381414
batch 113 d_loss : 0.144091
batch 113 g_loss : 2.366661
batch 114 d_loss : 0.127650
batch 114 g_loss : 2.351634
batch 115 d_loss : 0.098281
batch 115 g_loss : 2.374485
batch 116 d_loss : 0.126571
batch 116 g_loss : 2.413742
batch 117 d_loss : 0.094585
batch 117 g_loss : 2.359540
batch 118 d_loss : 0.122732
batch 118 g_loss : 2.401978
batch 119 d_loss : 0.150005
batch 119 g_loss : 2.427520
batch 120 d_loss : 0.110416
batch 120 g_loss : 2.424524
batch 121 d_loss : 0.127433
batch 121 g_loss : 2.456051
batch 122 d_loss : 0.119622
batch 122 g_loss : 2.523696
batch 123 d_loss : 0.133822
batch 123 g_loss : 2.450019
batch 124 d_loss : 0.105422
batch 124 g_loss : 2.504797
batch 125 d_loss : 0.131542
batch 125 g_loss : 2.430504
batch 126 d_loss : 0.130418
batch 126 g_loss : 2.362828
batch 127 d_loss : 0.118128
batch 127 g_loss : 2.493742
batch 128 d_loss : 0.148202
batch 128 g_loss : 2.427340
batch 129 d_loss : 0.121626
batch 129 g_loss : 2.461035
Epoch is 5
Number of batches 130
batch 0 d_loss : 0.080342
batch 0 g_loss : 2.435441

```

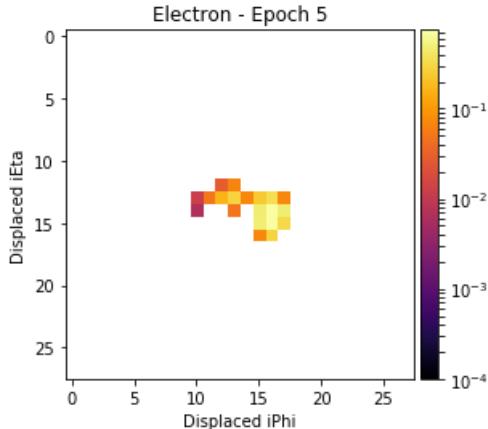
Layer (type)	set[disabled] .btn-link:focus {
.btn-lg,	color: #777777;
. Output Shape	Param #
<hr/>	
dense_229 (Dense)	(None, 1024) 103424
activation_457 (Activation)	(None, 1024) 0
dense_230 (Dense)	(None, 6272) 6428800
batch_normalization_112 (Batch Normalization)	(None, 6272) 25088
activation_458 (Activation)	(None, 6272) 0

reshape_112 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_223 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_229 (Conv2D)	(None, 14, 14, 64)	204864
activation_459 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_224 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_230 (Conv2D)	(None, 28, 28, 1)	1601
activation_460 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544



```

batch 1 d_loss : 0.146317
batch 1 g_loss : 2.434605
batch 2 d_loss : 0.107164
batch 2 g_loss : 2.408732
batch 3 d_loss : 0.074502
batch 3 g_loss : 2.455862
batch 4 d_loss : 0.156094
batch 4 g_loss : 2.439663
batch 5 d_loss : 0.117926
batch 5 g_loss : 2.486920
batch 6 d_loss : 0.162892
batch 6 g_loss : 2.369342
batch 7 d_loss : 0.160571
batch 7 g_loss : 2.520705
batch 8 d_loss : 0.152494
batch 8 g_loss : 2.484946
batch 9 d_loss : 0.125702
batch 9 g_loss : 2.447489
batch 10 d_loss : 0.175620
batch 10 g_loss : 2.449732
batch 11 d_loss : 0.142167
batch 11 g_loss : 2.468521
batch 12 d_loss : 0.163666
batch 12 g_loss : 2.475253
batch 13 d_loss : 0.117748
batch 13 g_loss : 2.455343
batch 14 d_loss : 0.145392
batch 14 g_loss : 2.477027
batch 15 d_loss : 0.164870
batch 15 g_loss : 2.421155
batch 16 d_loss : 0.143638
batch 16 g_loss : 2.415743
batch 17 d_loss : 0.106942
batch 17 g_loss : 2.386597
batch 18 d_loss : 0.148297

```

```
batch 18 g_loss : 2.619489
batch 19 d_loss : 0.119864
batch 19 g_loss : 2.492881
batch 20 d_loss : 0.115291
batch 20 g_loss : 2.367827
batch 21 d_loss : 0.142728
batch 21 g_loss : 2.386150
batch 22 d_loss : 0.131027
batch 22 g_loss : 2.469343
batch 23 d_loss : 0.114657
batch 23 g_loss : 2.429047
batch 24 d_loss : 0.108565
batch 24 g_loss : 2.398263
batch 25 d_loss : 0.171294
batch 25 g_loss : 2.417268
batch 26 d_loss : 0.108952
batch 26 g_loss : 2.439774
batch 27 d_loss : 0.107476
batch 27 g_loss : 2.455342
batch 28 d_loss : 0.136989
batch 28 g_loss : 2.523858
batch 29 d_loss : 0.150864
batch 29 g_loss : 2.374813
batch 30 d_loss : 0.097546
batch 30 g_loss : 2.491183
batch 31 d_loss : 0.126493
batch 31 g_loss : 2.407715
batch 32 d_loss : 0.107916
batch 32 g_loss : 2.503784
batch 33 d_loss : 0.093661
batch 33 g_loss : 2.445880
batch 34 d_loss : 0.154067
batch 34 g_loss : 2.389946
batch 35 d_loss : 0.129257
batch 35 g_loss : 2.480661
batch 36 d_loss : 0.111747
batch 36 g_loss : 2.568739
batch 37 d_loss : 0.099264
batch 37 g_loss : 2.482175
batch 38 d_loss : 0.130790
batch 38 g_loss : 2.489040
batch 39 d_loss : 0.107103
batch 39 g_loss : 2.422939
batch 40 d_loss : 0.153821
batch 40 g_loss : 2.460401
batch 41 d_loss : 0.122152
batch 41 g_loss : 2.531040
batch 42 d_loss : 0.096006
batch 42 g_loss : 2.517639
batch 43 d_loss : 0.157412
batch 43 g_loss : 2.550708
batch 44 d_loss : 0.095754
batch 44 g_loss : 2.420907
batch 45 d_loss : 0.095000
batch 45 g_loss : 2.537172
batch 46 d_loss : 0.131702
batch 46 g_loss : 2.520336
batch 47 d_loss : 0.137039
batch 47 g_loss : 2.566175
batch 48 d_loss : 0.161148
batch 48 g_loss : 2.533607
batch 49 d_loss : 0.135702
batch 49 g_loss : 2.493962
batch 50 d_loss : 0.168456
batch 50 g_loss : 2.466145
batch 51 d_loss : 0.126356
batch 51 g_loss : 2.497537
batch 52 d_loss : 0.118157
batch 52 g_loss : 2.448618
batch 53 d_loss : 0.071337
batch 53 g_loss : 2.506873
batch 54 d_loss : 0.139287
batch 54 g_loss : 2.506026
```

batch 54 g\_loss : 2.500950  
batch 55 d\_loss : 0.154400  
batch 55 g\_loss : 2.485411  
batch 56 d\_loss : 0.105934  
batch 56 g\_loss : 2.478654  
batch 57 d\_loss : 0.105197  
batch 57 g\_loss : 2.465900  
batch 58 d\_loss : 0.140497  
batch 58 g\_loss : 2.537682  
batch 59 d\_loss : 0.113352  
batch 59 g\_loss : 2.450769  
batch 60 d\_loss : 0.128823  
batch 60 g\_loss : 2.403717  
batch 61 d\_loss : 0.145927  
batch 61 g\_loss : 2.459275  
batch 62 d\_loss : 0.206146  
batch 62 g\_loss : 2.596670  
batch 63 d\_loss : 0.108722  
batch 63 g\_loss : 2.516727  
batch 64 d\_loss : 0.108949  
batch 64 g\_loss : 2.508616  
batch 65 d\_loss : 0.117270  
batch 65 g\_loss : 2.539679  
batch 66 d\_loss : 0.169267  
batch 66 g\_loss : 2.513057  
batch 67 d\_loss : 0.115784  
batch 67 g\_loss : 2.499289  
batch 68 d\_loss : 0.171649  
batch 68 g\_loss : 2.500837  
batch 69 d\_loss : 0.153394  
batch 69 g\_loss : 2.556476  
batch 70 d\_loss : 0.145932  
batch 70 g\_loss : 2.485012  
batch 71 d\_loss : 0.098750  
batch 71 g\_loss : 2.543361  
batch 72 d\_loss : 0.166592  
batch 72 g\_loss : 2.390911  
batch 73 d\_loss : 0.123206  
batch 73 g\_loss : 2.514153  
batch 74 d\_loss : 0.106065  
batch 74 g\_loss : 2.570104  
batch 75 d\_loss : 0.185757  
batch 75 g\_loss : 2.497916  
batch 76 d\_loss : 0.122813  
batch 76 g\_loss : 2.514461  
batch 77 d\_loss : 0.123659  
batch 77 g\_loss : 2.489654  
batch 78 d\_loss : 0.166476  
batch 78 g\_loss : 2.549278  
batch 79 d\_loss : 0.116172  
batch 79 g\_loss : 2.496562  
batch 80 d\_loss : 0.144272  
batch 80 g\_loss : 2.436191  
batch 81 d\_loss : 0.157758  
batch 81 g\_loss : 2.474490  
batch 82 d\_loss : 0.151254  
batch 82 g\_loss : 2.537060  
batch 83 d\_loss : 0.106054  
batch 83 g\_loss : 2.478028  
batch 84 d\_loss : 0.117704  
batch 84 g\_loss : 2.523416  
batch 85 d\_loss : 0.162781  
batch 85 g\_loss : 2.455741  
batch 86 d\_loss : 0.103280  
batch 86 g\_loss : 2.467452  
batch 87 d\_loss : 0.131960  
batch 87 g\_loss : 2.490955  
batch 88 d\_loss : 0.113303  
batch 88 g\_loss : 2.442915  
batch 89 d\_loss : 0.102415  
batch 89 g\_loss : 2.457924  
batch 90 d\_loss : 0.115314  
batch 90 g\_loss : 2.431471

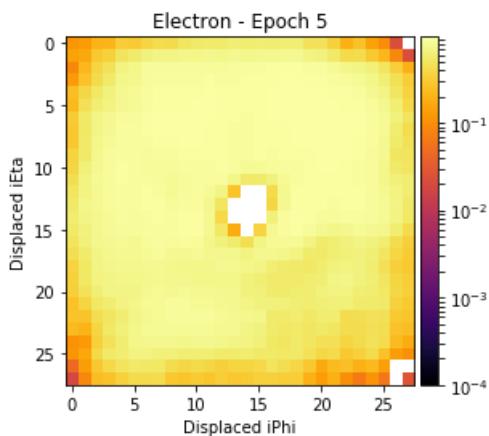
```

batch 90 g_loss : 2.45141
batch 91 d_loss : 0.123990
batch 91 g_loss : 2.480136
batch 92 d_loss : 0.166475
batch 92 g_loss : 2.398341
batch 93 d_loss : 0.107605
batch 93 g_loss : 2.436423
batch 94 d_loss : 0.151798
batch 94 g_loss : 2.508493
batch 95 d_loss : 0.108024
batch 95 g_loss : 2.470346
batch 96 d_loss : 0.146135
batch 96 g_loss : 2.488571
batch 97 d_loss : 0.124274
batch 97 g_loss : 2.485149
batch 98 d_loss : 0.100626
batch 98 g_loss : 2.430879
batch 99 d_loss : 0.133921
batch 99 g_loss : 2.541309
batch 100 d_loss : 0.107594
batch 100 g_loss : 2.475560

```

Layer (type)	Output Shape	Param #
dense_231 (Dense)	(None, 1024)	103424
activation_461 (Activation)	(None, 1024)	0
dense_232 (Dense)	(None, 6272)	6428800
batch_normalization_113 (Batch Normalization)	(None, 6272)	25088
activation_462 (Activation)	(None, 6272)	0
reshape_113 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_225 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_231 (Conv2D)	(None, 14, 14, 64)	204864
activation_463 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_226 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_232 (Conv2D)	(None, 28, 28, 1)	1601
activation_464 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
 Trainable params: 6,751,233  
 Non-trainable params: 12,544



```

batch 101 d_loss : 0.150163
batch 101 g_loss : 2.494900

```

```

batch 102 d_loss : 0.107531
batch 102 g_loss : 2.474960
batch 103 d_loss : 0.121647
batch 103 g_loss : 2.464748
batch 104 d_loss : 0.116613
batch 104 g_loss : 2.443362
batch 105 d_loss : 0.130821
batch 105 g_loss : 2.589379
batch 106 d_loss : 0.106933
batch 106 g_loss : 2.510011
batch 107 d_loss : 0.098985
batch 107 g_loss : 2.469114
batch 108 d_loss : 0.105157
batch 108 g_loss : 2.588490
batch 109 d_loss : 0.131123
batch 109 g_loss : 2.494513
batch 110 d_loss : 0.113819
batch 110 g_loss : 2.519983
batch 111 d_loss : 0.115827
batch 111 g_loss : 2.447349
batch 112 d_loss : 0.120571
batch 112 g_loss : 2.441809
batch 113 d_loss : 0.139617
batch 113 g_loss : 2.415204
batch 114 d_loss : 0.125079
batch 114 g_loss : 2.392980
batch 115 d_loss : 0.096003
batch 115 g_loss : 2.551959
batch 116 d_loss : 0.123716
batch 116 g_loss : 2.556182
batch 117 d_loss : 0.087870
batch 117 g_loss : 2.535109
batch 118 d_loss : 0.118743
batch 118 g_loss : 2.454463
batch 119 d_loss : 0.142613
batch 119 g_loss : 2.544338
batch 120 d_loss : 0.105949
batch 120 g_loss : 2.555827
batch 121 d_loss : 0.121604
batch 121 g_loss : 2.651309
batch 122 d_loss : 0.112041
batch 122 g_loss : 2.484970
batch 123 d_loss : 0.127641
batch 123 g_loss : 2.546799
batch 124 d_loss : 0.103472
batch 124 g_loss : 2.442712
batch 125 d_loss : 0.132259
batch 125 g_loss : 2.545465
batch 126 d_loss : 0.126549
batch 126 g_loss : 2.467081
batch 127 d_loss : 0.114152
batch 127 g_loss : 2.568641
batch 128 d_loss : 0.144266
batch 128 g_loss : 2.547713
batch 129 d_loss : 0.116825
batch 129 g_loss : 2.587540
Epoch is 6
Number of batches 130
batch 0 d_loss : 0.077089
batch 0 g_loss : 2.521823

```

Layer (type)	Output Shape	Param #
dense_233 (Dense)	(None, 1024)	103424
activation_465 (Activation)	(None, 1024)	0
dense_234 (Dense)	(None, 6272)	6428800
batch_normalization_114 (Batch Normalization)	(None, 6272)	25088
activation_466 (Activation)	(None, 6272)	0

---

reshape_114 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_227 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_233 (Conv2D)	(None, 14, 14, 64)	204864
activation_467 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_228 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_234 (Conv2D)	(None, 28, 28, 1)	1601
activation_468 (Activation)	(None, 28, 28, 1)	0

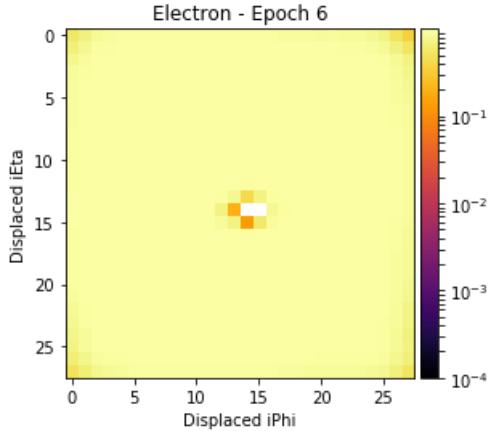
---

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544

---



```

batch 1 d_loss : 0.140830
batch 1 g_loss : 2.556112
batch 2 d_loss : 0.103998
batch 2 g_loss : 2.572608
batch 3 d_loss : 0.070157
batch 3 g_loss : 2.504750
batch 4 d_loss : 0.150855
batch 4 g_loss : 2.494703
batch 5 d_loss : 0.114241
batch 5 g_loss : 2.501597
batch 6 d_loss : 0.160763
batch 6 g_loss : 2.527372
batch 7 d_loss : 0.156189
batch 7 g_loss : 2.607979
batch 8 d_loss : 0.146043
batch 8 g_loss : 2.513496
batch 9 d_loss : 0.121745
batch 9 g_loss : 2.603073
batch 10 d_loss : 0.174241
batch 10 g_loss : 2.516121
batch 11 d_loss : 0.137993
batch 11 g_loss : 2.566709
batch 12 d_loss : 0.156126
batch 12 g_loss : 2.585727
batch 13 d_loss : 0.113980
batch 13 g_loss : 2.518971
batch 14 d_loss : 0.139445
batch 14 g_loss : 2.540479
batch 15 d_loss : 0.160519
batch 15 g_loss : 2.611877
batch 16 d_loss : 0.138520
batch 16 g_loss : 2.547507
batch 17 d_loss : 0.103126
batch 17 g_loss : 2.474499

```

batch 18 d\_loss : 0.144922  
batch 18 g\_loss : 2.563236  
batch 19 d\_loss : 0.115527  
batch 19 g\_loss : 2.517371  
batch 20 d\_loss : 0.109501  
batch 20 g\_loss : 2.557210  
batch 21 d\_loss : 0.138959  
batch 21 g\_loss : 2.505615  
batch 22 d\_loss : 0.128236  
batch 22 g\_loss : 2.572447  
batch 23 d\_loss : 0.111253  
batch 23 g\_loss : 2.523382  
batch 24 d\_loss : 0.105462  
batch 24 g\_loss : 2.491513  
batch 25 d\_loss : 0.164735  
batch 25 g\_loss : 2.463191  
batch 26 d\_loss : 0.106018  
batch 26 g\_loss : 2.580773  
batch 27 d\_loss : 0.106482  
batch 27 g\_loss : 2.548268  
batch 28 d\_loss : 0.132417  
batch 28 g\_loss : 2.465385  
batch 29 d\_loss : 0.143722  
batch 29 g\_loss : 2.491401  
batch 30 d\_loss : 0.092989  
batch 30 g\_loss : 2.569753  
batch 31 d\_loss : 0.120776  
batch 31 g\_loss : 2.541297  
batch 32 d\_loss : 0.104350  
batch 32 g\_loss : 2.513764  
batch 33 d\_loss : 0.089092  
batch 33 g\_loss : 2.491924  
batch 34 d\_loss : 0.148895  
batch 34 g\_loss : 2.517281  
batch 35 d\_loss : 0.123798  
batch 35 g\_loss : 2.479883  
batch 36 d\_loss : 0.108100  
batch 36 g\_loss : 2.448522  
batch 37 d\_loss : 0.095577  
batch 37 g\_loss : 2.508946  
batch 38 d\_loss : 0.126385  
batch 38 g\_loss : 2.571713  
batch 39 d\_loss : 0.102885  
batch 39 g\_loss : 2.523336  
batch 40 d\_loss : 0.146620  
batch 40 g\_loss : 2.533387  
batch 41 d\_loss : 0.118258  
batch 41 g\_loss : 2.571233  
batch 42 d\_loss : 0.091421  
batch 42 g\_loss : 2.507359  
batch 43 d\_loss : 0.152031  
batch 43 g\_loss : 2.531191  
batch 44 d\_loss : 0.094836  
batch 44 g\_loss : 2.541824  
batch 45 d\_loss : 0.091290  
batch 45 g\_loss : 2.440523  
batch 46 d\_loss : 0.127354  
batch 46 g\_loss : 2.480788  
batch 47 d\_loss : 0.132460  
batch 47 g\_loss : 2.542809  
batch 48 d\_loss : 0.155476  
batch 48 g\_loss : 2.585419  
batch 49 d\_loss : 0.130913  
batch 49 g\_loss : 2.483369  
batch 50 d\_loss : 0.162165  
batch 50 g\_loss : 2.542225  
batch 51 d\_loss : 0.120774  
batch 51 g\_loss : 2.424414  
batch 52 d\_loss : 0.113752  
batch 52 g\_loss : 2.502730  
batch 53 d\_loss : 0.066149  
batch 53 g\_loss : 2.507105

```
batch 54 d_loss : 0.134591
batch 54 g_loss : 2.468391
batch 55 d_loss : 0.148621
batch 55 g_loss : 2.517738
batch 56 d_loss : 0.102325
batch 56 g_loss : 2.668708
batch 57 d_loss : 0.101620
batch 57 g_loss : 2.512490
batch 58 d_loss : 0.133339
batch 58 g_loss : 2.453593
batch 59 d_loss : 0.108959
batch 59 g_loss : 2.587042
batch 60 d_loss : 0.124977
batch 60 g_loss : 2.594058
batch 61 d_loss : 0.140617
batch 61 g_loss : 2.452975
batch 62 d_loss : 0.199141
batch 62 g_loss : 2.588401
batch 63 d_loss : 0.104262
batch 63 g_loss : 2.507554
batch 64 d_loss : 0.103814
batch 64 g_loss : 2.607747
batch 65 d_loss : 0.110509
batch 65 g_loss : 2.644026
batch 66 d_loss : 0.163590
batch 66 g_loss : 2.520772
batch 67 d_loss : 0.111874
batch 67 g_loss : 2.569104
batch 68 d_loss : 0.166540
batch 68 g_loss : 2.560222
batch 69 d_loss : 0.147129
batch 69 g_loss : 2.539932
batch 70 d_loss : 0.139937
batch 70 g_loss : 2.529771
batch 71 d_loss : 0.098012
batch 71 g_loss : 2.544163
batch 72 d_loss : 0.161377
batch 72 g_loss : 2.469283
batch 73 d_loss : 0.118381
batch 73 g_loss : 2.519544
batch 74 d_loss : 0.101253
batch 74 g_loss : 2.455248
batch 75 d_loss : 0.176507
batch 75 g_loss : 2.528295
batch 76 d_loss : 0.117712
batch 76 g_loss : 2.518761
batch 77 d_loss : 0.117227
batch 77 g_loss : 2.459646
batch 78 d_loss : 0.158512
batch 78 g_loss : 2.424987
batch 79 d_loss : 0.106828
batch 79 g_loss : 2.477155
batch 80 d_loss : 0.137977
batch 80 g_loss : 2.487359
batch 81 d_loss : 0.151078
batch 81 g_loss : 2.459876
batch 82 d_loss : 0.142345
batch 82 g_loss : 2.449608
batch 83 d_loss : 0.100945
batch 83 g_loss : 2.464786
batch 84 d_loss : 0.109467
batch 84 g_loss : 2.456323
batch 85 d_loss : 0.157182
batch 85 g_loss : 2.501721
batch 86 d_loss : 0.097063
batch 86 g_loss : 2.473196
batch 87 d_loss : 0.127821
batch 87 g_loss : 2.492091
batch 88 d_loss : 0.109126
batch 88 g_loss : 2.452685
batch 89 d_loss : 0.096477
batch 89 g_loss : 2.512140
```

```

batch 90 a_loss : 0.115558
batch 90 g_loss : 2.440383
batch 91 d_loss : 0.115602
batch 91 g_loss : 2.428520
batch 92 d_loss : 0.157069
batch 92 g_loss : 2.428515
batch 93 d_loss : 0.102129
batch 93 g_loss : 2.587193
batch 94 d_loss : 0.142628
batch 94 g_loss : 2.477696
batch 95 d_loss : 0.102609
batch 95 g_loss : 2.498377
batch 96 d_loss : 0.140545
batch 96 g_loss : 2.594313
batch 97 d_loss : 0.117796
batch 97 g_loss : 2.441453
batch 98 d_loss : 0.094475
batch 98 g_loss : 2.513292
batch 99 d_loss : 0.128259
batch 99 g_loss : 2.491796
batch 100 d_loss : 0.102055
batch 100 g_loss : 2.509507

```

Layer (type)	Output Shape	Param #
dense_235 (Dense)	(None, 1024)	103424
activation_469 (Activation)	(None, 1024)	0
dense_236 (Dense)	(None, 6272)	6428800
batch_normalization_115 (Batch Normalization)	(None, 6272)	25088
activation_470 (Activation)	(None, 6272)	0
reshape_115 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_229 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_235 (Conv2D)	(None, 14, 14, 64)	204864
activation_471 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_230 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_236 (Conv2D)	(None, 28, 28, 1)	1601
activation_472 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
 Trainable params: 6,751,233  
 Non-trainable params: 12,544

---

batch 101 d loss : 0.142311

```

batch 101 g_loss : 2.448167
batch 102 d_loss : 0.102295
batch 102 g_loss : 2.458198
batch 103 d_loss : 0.115030
batch 103 g_loss : 2.475160
batch 104 d_loss : 0.112823
batch 104 g_loss : 2.447367
batch 105 d_loss : 0.126497
batch 105 g_loss : 2.471730
batch 106 d_loss : 0.102739
batch 106 g_loss : 2.549825
batch 107 d_loss : 0.094003
batch 107 g_loss : 2.521044
batch 108 d_loss : 0.103957
batch 108 g_loss : 2.510688
batch 109 d_loss : 0.125589
batch 109 g_loss : 2.490997
batch 110 d_loss : 0.109272
batch 110 g_loss : 2.514536
batch 111 d_loss : 0.109199
batch 111 g_loss : 2.518695
batch 112 d_loss : 0.113487
batch 112 g_loss : 2.554252
batch 113 d_loss : 0.131746
batch 113 g_loss : 2.470575
batch 114 d_loss : 0.117128
batch 114 g_loss : 2.600390
batch 115 d_loss : 0.092608
batch 115 g_loss : 2.474402
batch 116 d_loss : 0.118592
batch 116 g_loss : 2.494883
batch 117 d_loss : 0.086874
batch 117 g_loss : 2.498981
batch 118 d_loss : 0.112507
batch 118 g_loss : 2.590009
batch 119 d_loss : 0.136741
batch 119 g_loss : 2.523749
batch 120 d_loss : 0.101677
batch 120 g_loss : 2.494930
batch 121 d_loss : 0.115168
batch 121 g_loss : 2.441518
batch 122 d_loss : 0.110018
batch 122 g_loss : 2.471873
batch 123 d_loss : 0.121711
batch 123 g_loss : 2.567775
batch 124 d_loss : 0.100065
batch 124 g_loss : 2.566302
batch 125 d_loss : 0.124620
batch 125 g_loss : 2.443452
batch 126 d_loss : 0.120513
batch 126 g_loss : 2.469311
batch 127 d_loss : 0.108297
batch 127 g_loss : 2.460645
batch 128 d_loss : 0.138372
batch 128 g_loss : 2.641366
batch 129 d_loss : 0.111700
batch 129 g_loss : 2.594832
Epoch is 7
Number of batches 130
batch 0 d_loss : 0.075672
batch 0 g_loss : 2.569579

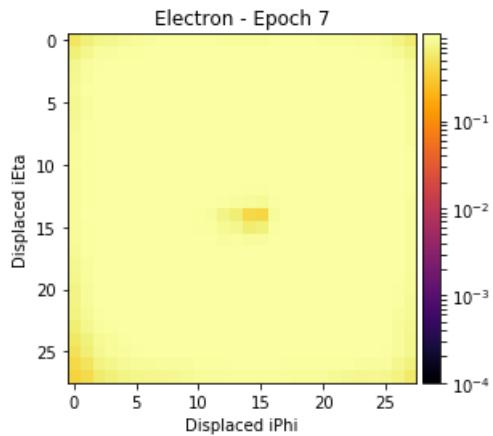
```

Layer (type)	Output Shape	Param #
dense_237 (Dense)	(None, 1024)	103424
activation_473 (Activation)	(None, 1024)	0
dense_238 (Dense)	(None, 6272)	6428800
batch_normalization_116 (Batch Normalization)	(None, 6272)	25088

activation_474	(Activation)	(None, 6272)	0
reshape_116	(Reshape)	(None, 7, 7, 128)	0
up_sampling2d_231	(UpSampling2D)	(None, 14, 14, 128)	0
conv2d_237	(Conv2D)	(None, 14, 14, 64)	204864
activation_475	(Activation)	(None, 14, 14, 64)	0
up_sampling2d_232	(UpSampling2D)	(None, 28, 28, 64)	0
conv2d_238	(Conv2D)	(None, 28, 28, 1)	1601
activation_476	(Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544

---



```

batch 1 d_loss : 0.134852
batch 1 g_loss : 2.524573
batch 2 d_loss : 0.097319
batch 2 g_loss : 2.537520
batch 3 d_loss : 0.069395
batch 3 g_loss : 2.661773
batch 4 d_loss : 0.142390
batch 4 g_loss : 2.530136
batch 5 d_loss : 0.109362
batch 5 g_loss : 2.581944
batch 6 d_loss : 0.152515
batch 6 g_loss : 2.622075
batch 7 d_loss : 0.148005
batch 7 g_loss : 2.540975
batch 8 d_loss : 0.139917
batch 8 g_loss : 2.527409
batch 9 d_loss : 0.115618
batch 9 g_loss : 2.593787
batch 10 d_loss : 0.164101
batch 10 g_loss : 2.544321
batch 11 d_loss : 0.132438
batch 11 g_loss : 2.582592
batch 12 d_loss : 0.149423
batch 12 g_loss : 2.458252
batch 13 d_loss : 0.110287
batch 13 g_loss : 2.676944
batch 14 d_loss : 0.133604
batch 14 g_loss : 2.534962
batch 15 d_loss : 0.150900
batch 15 g_loss : 2.507032
batch 16 d_loss : 0.131634
batch 16 g_loss : 2.543170
batch 17 d_loss : 0.097014

```

batch 17 g\_loss : 2.537227  
batch 18 d\_loss : 0.138572  
batch 18 g\_loss : 2.516563  
batch 19 d\_loss : 0.112195  
batch 19 g\_loss : 2.488391  
batch 20 d\_loss : 0.104338  
batch 20 g\_loss : 2.571164  
batch 21 d\_loss : 0.131804  
batch 21 g\_loss : 2.528268  
batch 22 d\_loss : 0.118980  
batch 22 g\_loss : 2.450343  
batch 23 d\_loss : 0.104139  
batch 23 g\_loss : 2.468192  
batch 24 d\_loss : 0.102087  
batch 24 g\_loss : 2.486281  
batch 25 d\_loss : 0.155360  
batch 25 g\_loss : 2.517873  
batch 26 d\_loss : 0.099703  
batch 26 g\_loss : 2.489141  
batch 27 d\_loss : 0.100177  
batch 27 g\_loss : 2.482347  
batch 28 d\_loss : 0.124860  
batch 28 g\_loss : 2.583807  
batch 29 d\_loss : 0.136526  
batch 29 g\_loss : 2.472412  
batch 30 d\_loss : 0.090880  
batch 30 g\_loss : 2.480049  
batch 31 d\_loss : 0.113552  
batch 31 g\_loss : 2.542197  
batch 32 d\_loss : 0.099489  
batch 32 g\_loss : 2.502859  
batch 33 d\_loss : 0.084742  
batch 33 g\_loss : 2.541485  
batch 34 d\_loss : 0.140391  
batch 34 g\_loss : 2.604903  
batch 35 d\_loss : 0.119094  
batch 35 g\_loss : 2.515995  
batch 36 d\_loss : 0.103054  
batch 36 g\_loss : 2.568651  
batch 37 d\_loss : 0.091502  
batch 37 g\_loss : 2.536415  
batch 38 d\_loss : 0.118856  
batch 38 g\_loss : 2.538348  
batch 39 d\_loss : 0.099587  
batch 39 g\_loss : 2.513745  
batch 40 d\_loss : 0.138631  
batch 40 g\_loss : 2.511665  
batch 41 d\_loss : 0.112147  
batch 41 g\_loss : 2.519923  
batch 42 d\_loss : 0.088687  
batch 42 g\_loss : 2.497501  
batch 43 d\_loss : 0.146658  
batch 43 g\_loss : 2.427551  
batch 44 d\_loss : 0.089934  
batch 44 g\_loss : 2.562604  
batch 45 d\_loss : 0.085953  
batch 45 g\_loss : 2.577051  
batch 46 d\_loss : 0.122853  
batch 46 g\_loss : 2.519325  
batch 47 d\_loss : 0.125870  
batch 47 g\_loss : 2.548482  
batch 48 d\_loss : 0.146653  
batch 48 g\_loss : 2.490853  
batch 49 d\_loss : 0.123748  
batch 49 g\_loss : 2.569048  
batch 50 d\_loss : 0.152426  
batch 50 g\_loss : 2.563024  
batch 51 d\_loss : 0.113289  
batch 51 g\_loss : 2.503520  
batch 52 d\_loss : 0.109122  
batch 52 g\_loss : 2.561253  
batch 53 d\_loss : 0.063735  
. . . . .

batch 53 g\_loss : 2.573088  
batch 54 d\_loss : 0.127151  
batch 54 g\_loss : 2.503839  
batch 55 d\_loss : 0.142024  
batch 55 g\_loss : 2.540670  
batch 56 d\_loss : 0.098678  
batch 56 g\_loss : 2.486331  
batch 57 d\_loss : 0.097098  
batch 57 g\_loss : 2.497762  
batch 58 d\_loss : 0.126684  
batch 58 g\_loss : 2.562807  
batch 59 d\_loss : 0.103430  
batch 59 g\_loss : 2.594942  
batch 60 d\_loss : 0.117160  
batch 60 g\_loss : 2.576549  
batch 61 d\_loss : 0.131349  
batch 61 g\_loss : 2.579780  
batch 62 d\_loss : 0.186503  
batch 62 g\_loss : 2.532127  
batch 63 d\_loss : 0.099038  
batch 63 g\_loss : 2.605979  
batch 64 d\_loss : 0.100749  
batch 64 g\_loss : 2.547337  
batch 65 d\_loss : 0.105326  
batch 65 g\_loss : 2.514313  
batch 66 d\_loss : 0.153492  
batch 66 g\_loss : 2.587333  
batch 67 d\_loss : 0.104750  
batch 67 g\_loss : 2.579504  
batch 68 d\_loss : 0.158908  
batch 68 g\_loss : 2.540531  
batch 69 d\_loss : 0.140191  
batch 69 g\_loss : 2.502671  
batch 70 d\_loss : 0.132106  
batch 70 g\_loss : 2.528378  
batch 71 d\_loss : 0.092413  
batch 71 g\_loss : 2.598005  
batch 72 d\_loss : 0.150256  
batch 72 g\_loss : 2.534799  
batch 73 d\_loss : 0.110765  
batch 73 g\_loss : 2.500687  
batch 74 d\_loss : 0.096244  
batch 74 g\_loss : 2.592049  
batch 75 d\_loss : 0.169512  
batch 75 g\_loss : 2.570812  
batch 76 d\_loss : 0.112360  
batch 76 g\_loss : 2.530073  
batch 77 d\_loss : 0.112511  
batch 77 g\_loss : 2.646728  
batch 78 d\_loss : 0.148811  
batch 78 g\_loss : 2.598978  
batch 79 d\_loss : 0.103286  
batch 79 g\_loss : 2.566684  
batch 80 d\_loss : 0.131643  
batch 80 g\_loss : 2.632664  
batch 81 d\_loss : 0.142032  
batch 81 g\_loss : 2.535368  
batch 82 d\_loss : 0.134570  
batch 82 g\_loss : 2.535536  
batch 83 d\_loss : 0.096236  
batch 83 g\_loss : 2.495793  
batch 84 d\_loss : 0.105906  
batch 84 g\_loss : 2.490860  
batch 85 d\_loss : 0.147852  
batch 85 g\_loss : 2.550305  
batch 86 d\_loss : 0.091564  
batch 86 g\_loss : 2.509687  
batch 87 d\_loss : 0.119602  
batch 87 g\_loss : 2.558795  
batch 88 d\_loss : 0.104764  
batch 88 g\_loss : 2.496575  
batch 89 d\_loss : 0.092254  
` . . . . .` . . . . .

```

batch 89 g_loss : 2.634520
batch 90 d_loss : 0.103467
batch 90 g_loss : 2.421074
batch 91 d_loss : 0.111799
batch 91 g_loss : 2.516275
batch 92 d_loss : 0.150006
batch 92 g_loss : 2.566689
batch 93 d_loss : 0.097786
batch 93 g_loss : 2.513539
batch 94 d_loss : 0.135857
batch 94 g_loss : 2.600990
batch 95 d_loss : 0.096982
batch 95 g_loss : 2.497458
batch 96 d_loss : 0.131696
batch 96 g_loss : 2.503623
batch 97 d_loss : 0.112184
batch 97 g_loss : 2.574040
batch 98 d_loss : 0.090027
batch 98 g_loss : 2.616071
batch 99 d_loss : 0.120571
batch 99 g_loss : 2.584911
batch 100 d_loss : 0.097125
batch 100 g_loss : 2.513829

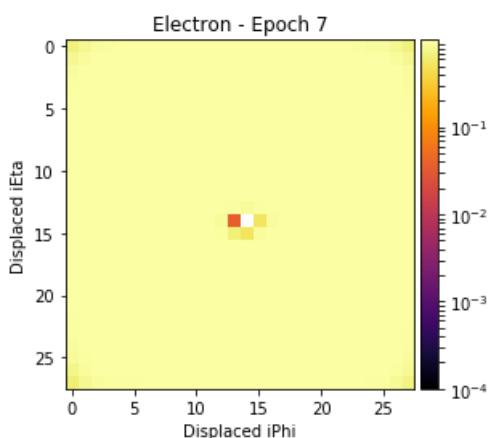
```

Layer (type)	Output Shape	Param #
dense_239 (Dense)	(None, 1024)	103424
activation_477 (Activation)	(None, 1024)	0
dense_240 (Dense)	(None, 6272)	6428800
batch_normalization_117 (Batch Normalization)	(None, 6272)	25088
activation_478 (Activation)	(None, 6272)	0
reshape_117 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_233 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_239 (Conv2D)	(None, 14, 14, 64)	204864
activation_479 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_234 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_240 (Conv2D)	(None, 28, 28, 1)	1601
activation_480 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544



batch 101 d\_loss : 0.135667  
 batch 101 g\_loss : 2.463722  
 batch 102 d\_loss : 0.096225  
 batch 102 g\_loss : 2.486141  
 batch 103 d\_loss : 0.109310  
 batch 103 g\_loss : 2.563111  
 batch 104 d\_loss : 0.105240  
 batch 104 g\_loss : 2.595626  
 batch 105 d\_loss : 0.118173  
 batch 105 g\_loss : 2.497830  
 batch 106 d\_loss : 0.097138  
 batch 106 g\_loss : 2.648663  
 batch 107 d\_loss : 0.089998  
 batch 107 g\_loss : 2.606023  
 batch 108 d\_loss : 0.097844  
 batch 108 g\_loss : 2.486711  
 batch 109 d\_loss : 0.116513  
 batch 109 g\_loss : 2.492086  
 batch 110 d\_loss : 0.103279  
 batch 110 g\_loss : 2.517511  
 batch 111 d\_loss : 0.103387  
 batch 111 g\_loss : 2.720499  
 batch 112 d\_loss : 0.108092  
 batch 112 g\_loss : 2.552608  
 batch 113 d\_loss : 0.124960  
 batch 113 g\_loss : 2.620069  
 batch 114 d\_loss : 0.110653  
 batch 114 g\_loss : 2.610816  
 batch 115 d\_loss : 0.086412  
 batch 115 g\_loss : 2.566630  
 batch 116 d\_loss : 0.111363  
 batch 116 g\_loss : 2.591307  
 batch 117 d\_loss : 0.081558  
 batch 117 g\_loss : 2.537228  
 batch 118 d\_loss : 0.105104  
 batch 118 g\_loss : 2.690821  
 batch 119 d\_loss : 0.127117  
 batch 119 g\_loss : 2.595823  
 batch 120 d\_loss : 0.095726  
 batch 120 g\_loss : 2.571074  
 batch 121 d\_loss : 0.108187  
 batch 121 g\_loss : 2.569148  
 batch 122 d\_loss : 0.101106  
 batch 122 g\_loss : 2.607221  
 batch 123 d\_loss : 0.115248  
 batch 123 g\_loss : 2.616206  
 batch 124 d\_loss : 0.094072  
 batch 124 g\_loss : 2.602813  
 batch 125 d\_loss : 0.116720  
 batch 125 g\_loss : 2.573210  
 batch 126 d\_loss : 0.112326  
 batch 126 g\_loss : 2.625418  
 batch 127 d\_loss : 0.103928  
 batch 127 g\_loss : 2.669659  
 batch 128 d\_loss : 0.127781  
 batch 128 g\_loss : 2.576274  
 batch 129 d\_loss : 0.103673  
 batch 129 g\_loss : 2.578762  
 Epoch is 8  
 Number of batches 130  
 batch 0 d\_loss : 0.068985  
 batch 0 g\_loss : 2.616653

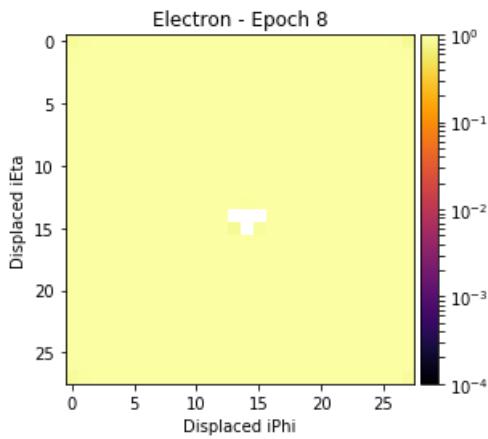
Layer (type)	Output Shape	Param #
dense_241 (Dense)	(None, 1024)	103424
activation_481 (Activation)	(None, 1024)	0
dense_242 (Dense)	(None, 6272)	6428800
batch normalization 118 (Batch Normalization)	(None, 6272)	25088

DNN1_NORMALIZATION_110 (None, None, ...)		
activation_482 (Activation)	(None, 6272)	0
reshape_118 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_235 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_241 (Conv2D)	(None, 14, 14, 64)	204864
activation_483 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_236 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_242 (Conv2D)	(None, 28, 28, 1)	1601
activation_484 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544



```

batch 1 d_loss : 0.126262
batch 1 g_loss : 2.598705
batch 2 d_loss : 0.092437
batch 2 g_loss : 2.567653
batch 3 d_loss : 0.065318
batch 3 g_loss : 2.601249
batch 4 d_loss : 0.132970
batch 4 g_loss : 2.679560
batch 5 d_loss : 0.101480
batch 5 g_loss : 2.579826
batch 6 d_loss : 0.143323
batch 6 g_loss : 2.626789
batch 7 d_loss : 0.135769
batch 7 g_loss : 2.651075
batch 8 d_loss : 0.129823
batch 8 g_loss : 2.605180
batch 9 d_loss : 0.107570
batch 9 g_loss : 2.632086
batch 10 d_loss : 0.151804
batch 10 g_loss : 2.647308
batch 11 d_loss : 0.123438
batch 11 g_loss : 2.722386
batch 12 d_loss : 0.140040
batch 12 g_loss : 2.609652
batch 13 d_loss : 0.101560
batch 13 g_loss : 2.611579
batch 14 d_loss : 0.124071
batch 14 g_loss : 2.567757
batch 15 d_loss : 0.139676
batch 15 g_loss : 2.662855
batch 16 d_loss : 0.121239
batch 16 g_loss : 2.575514

```

batch 17 d\_loss : 0.091387  
batch 17 g\_loss : 2.587162  
batch 18 d\_loss : 0.128487  
batch 18 g\_loss : 2.587629  
batch 19 d\_loss : 0.103687  
batch 19 g\_loss : 2.572239  
batch 20 d\_loss : 0.097571  
batch 20 g\_loss : 2.561610  
batch 21 d\_loss : 0.122255  
batch 21 g\_loss : 2.702162  
batch 22 d\_loss : 0.111608  
batch 22 g\_loss : 2.598662  
batch 23 d\_loss : 0.097312  
batch 23 g\_loss : 2.598216  
batch 24 d\_loss : 0.092428  
batch 24 g\_loss : 2.633175  
batch 25 d\_loss : 0.143081  
batch 25 g\_loss : 2.722734  
batch 26 d\_loss : 0.092996  
batch 26 g\_loss : 2.730646  
batch 27 d\_loss : 0.094078  
batch 27 g\_loss : 2.567753  
batch 28 d\_loss : 0.115598  
batch 28 g\_loss : 2.642264  
batch 29 d\_loss : 0.125942  
batch 29 g\_loss : 2.633749  
batch 30 d\_loss : 0.083151  
batch 30 g\_loss : 2.567329  
batch 31 d\_loss : 0.105762  
batch 31 g\_loss : 2.617749  
batch 32 d\_loss : 0.091736  
batch 32 g\_loss : 2.622539  
batch 33 d\_loss : 0.078790  
batch 33 g\_loss : 2.561848  
batch 34 d\_loss : 0.131276  
batch 34 g\_loss : 2.565537  
batch 35 d\_loss : 0.109220  
batch 35 g\_loss : 2.592982  
batch 36 d\_loss : 0.093882  
batch 36 g\_loss : 2.609469  
batch 37 d\_loss : 0.086516  
batch 37 g\_loss : 2.527590  
batch 38 d\_loss : 0.109744  
batch 38 g\_loss : 2.611196  
batch 39 d\_loss : 0.091789  
batch 39 g\_loss : 2.614196  
batch 40 d\_loss : 0.128698  
batch 40 g\_loss : 2.722916  
batch 41 d\_loss : 0.103747  
batch 41 g\_loss : 2.633983  
batch 42 d\_loss : 0.080984  
batch 42 g\_loss : 2.577433  
batch 43 d\_loss : 0.132514  
batch 43 g\_loss : 2.616535  
batch 44 d\_loss : 0.083405  
batch 44 g\_loss : 2.627713  
batch 45 d\_loss : 0.080719  
batch 45 g\_loss : 2.556322  
batch 46 d\_loss : 0.112714  
batch 46 g\_loss : 2.677126  
batch 47 d\_loss : 0.116544  
batch 47 g\_loss : 2.665206  
batch 48 d\_loss : 0.135172  
batch 48 g\_loss : 2.587317  
batch 49 d\_loss : 0.114117  
batch 49 g\_loss : 2.538554  
batch 50 d\_loss : 0.139865  
batch 50 g\_loss : 2.624482  
batch 51 d\_loss : 0.104529  
batch 51 g\_loss : 2.657864  
batch 52 d\_loss : 0.101425  
batch 52 g\_loss : 2.709050

batch 53 d\_loss : 0.060133  
batch 53 g\_loss : 2.656182  
batch 54 d\_loss : 0.116705  
batch 54 g\_loss : 2.582972  
batch 55 d\_loss : 0.129365  
batch 55 g\_loss : 2.673700  
batch 56 d\_loss : 0.090269  
batch 56 g\_loss : 2.682530  
batch 57 d\_loss : 0.088385  
batch 57 g\_loss : 2.646843  
batch 58 d\_loss : 0.115842  
batch 58 g\_loss : 2.624645  
batch 59 d\_loss : 0.095875  
batch 59 g\_loss : 2.599327  
batch 60 d\_loss : 0.105510  
batch 60 g\_loss : 2.719068  
batch 61 d\_loss : 0.120899  
batch 61 g\_loss : 2.588374  
batch 62 d\_loss : 0.170388  
batch 62 g\_loss : 2.702254  
batch 63 d\_loss : 0.091832  
batch 63 g\_loss : 2.622870  
batch 64 d\_loss : 0.089909  
batch 64 g\_loss : 2.662828  
batch 65 d\_loss : 0.098145  
batch 65 g\_loss : 2.621934  
batch 66 d\_loss : 0.140727  
batch 66 g\_loss : 2.636465  
batch 67 d\_loss : 0.095343  
batch 67 g\_loss : 2.666544  
batch 68 d\_loss : 0.142568  
batch 68 g\_loss : 2.663567  
batch 69 d\_loss : 0.126463  
batch 69 g\_loss : 2.667548  
batch 70 d\_loss : 0.120498  
batch 70 g\_loss : 2.629955  
batch 71 d\_loss : 0.083925  
batch 71 g\_loss : 2.610958  
batch 72 d\_loss : 0.138987  
batch 72 g\_loss : 2.618128  
batch 73 d\_loss : 0.103057  
batch 73 g\_loss : 2.644735  
batch 74 d\_loss : 0.087700  
batch 74 g\_loss : 2.694566  
batch 75 d\_loss : 0.152505  
batch 75 g\_loss : 2.634385  
batch 76 d\_loss : 0.103143  
batch 76 g\_loss : 2.684855  
batch 77 d\_loss : 0.102400  
batch 77 g\_loss : 2.767387  
batch 78 d\_loss : 0.136277  
batch 78 g\_loss : 2.639649  
batch 79 d\_loss : 0.093778  
batch 79 g\_loss : 2.795717  
batch 80 d\_loss : 0.117723  
batch 80 g\_loss : 2.661308  
batch 81 d\_loss : 0.129162  
batch 81 g\_loss : 2.704615  
batch 82 d\_loss : 0.122436  
batch 82 g\_loss : 2.554551  
batch 83 d\_loss : 0.086821  
batch 83 g\_loss : 2.697572  
batch 84 d\_loss : 0.095265  
batch 84 g\_loss : 2.657291  
batch 85 d\_loss : 0.134499  
batch 85 g\_loss : 2.605181  
batch 86 d\_loss : 0.086650  
batch 86 g\_loss : 2.676856  
batch 87 d\_loss : 0.108084  
batch 87 g\_loss : 2.649482  
batch 88 d\_loss : 0.094180  
batch 88 g\_loss : 2.671104

```
batch 89 d_loss : 0.083907
batch 89 g_loss : 2.675083
batch 90 d_loss : 0.094199
batch 90 g_loss : 2.557418
batch 91 d_loss : 0.100998
batch 91 g_loss : 2.694973
batch 92 d_loss : 0.135267
batch 92 g_loss : 2.639060
batch 93 d_loss : 0.089105
batch 93 g_loss : 2.647658
batch 94 d_loss : 0.122908
batch 94 g_loss : 2.633799
batch 95 d_loss : 0.089354
batch 95 g_loss : 2.720981
batch 96 d_loss : 0.118778
batch 96 g_loss : 2.726598
batch 97 d_loss : 0.099352
batch 97 g_loss : 2.628083
batch 98 d_loss : 0.082845
batch 98 g_loss : 2.704733
batch 99 d_loss : 0.108785
batch 99 g_loss : 2.766106
batch 100 d_loss : 0.087568
batch 100 g_loss : 2.693615
```

Layer (type)	Output Shape	Param #
dense_243 (Dense)	(None, 1024)	103424
activation_485 (Activation)	(None, 1024)	0
dense_244 (Dense)	(None, 6272)	6428800
batch_normalization_119 (Batch Normalization)	(None, 6272)	25088
activation_486 (Activation)	(None, 6272)	0
reshape_119 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_237 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_243 (Conv2D)	(None, 14, 14, 64)	204864
activation_487 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_238 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_244 (Conv2D)	(None, 28, 28, 1)	1601
activation_488 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544

```
batch 101 d_loss : 0.122858
batch 101 g_loss : 2.619005
batch 102 d_loss : 0.090633
batch 102 g_loss : 2.734154
batch 103 d_loss : 0.098398
batch 103 g_loss : 2.715317
batch 104 d_loss : 0.096729
batch 104 g_loss : 2.682213
batch 105 d_loss : 0.106199
batch 105 g_loss : 2.734241
batch 106 d_loss : 0.086927
batch 106 g_loss : 2.696982
batch 107 d_loss : 0.081478
batch 107 g_loss : 2.631494
batch 108 d_loss : 0.087331
batch 108 g_loss : 2.684318
batch 109 d_loss : 0.104971
batch 109 g_loss : 2.724196
batch 110 d_loss : 0.093707
batch 110 g_loss : 2.669280
batch 111 d_loss : 0.093855
batch 111 g_loss : 2.712279
batch 112 d_loss : 0.097175
batch 112 g_loss : 2.651441
batch 113 d_loss : 0.111026
batch 113 g_loss : 2.720422
batch 114 d_loss : 0.099801
batch 114 g_loss : 2.703692
batch 115 d_loss : 0.078225
batch 115 g_loss : 2.698329
batch 116 d_loss : 0.100017
batch 116 g_loss : 2.657503
batch 117 d_loss : 0.072582
batch 117 g_loss : 2.703189
batch 118 d_loss : 0.095634
batch 118 g_loss : 2.769654
batch 119 d_loss : 0.113949
batch 119 g_loss : 2.708151
batch 120 d_loss : 0.086560
batch 120 g_loss : 2.843138
batch 121 d_loss : 0.096691
batch 121 g_loss : 2.692161
batch 122 d_loss : 0.092339
batch 122 g_loss : 2.631838
batch 123 d_loss : 0.102737
batch 123 g_loss : 2.753838
batch 124 d_loss : 0.084522
batch 124 g_loss : 2.745479
batch 125 d_loss : 0.104502
batch 125 g_loss : 2.851527
batch 126 d_loss : 0.100337
batch 126 g_loss : 2.761937
batch 127 d_loss : 0.092548
batch 127 g_loss : 2.861769
```

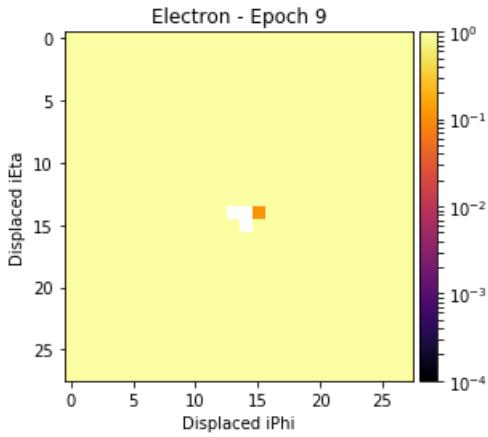
```

batch 12 g_loss : 2.00100
batch 128 d_loss : 0.115391
batch 128 g_loss : 2.695316
batch 129 d_loss : 0.092823
batch 129 g_loss : 2.713474
Epoch is 9
Number of batches 130
batch 0 d_loss : 0.062925
batch 0 g_loss : 2.812516

```

Layer (type)	Output Shape	Param #
dense_245 (Dense)	(None, 1024)	103424
activation_489 (Activation)	(None, 1024)	0
dense_246 (Dense)	(None, 6272)	6428800
batch_normalization_120 (Batch Normalization)	(None, 6272)	25088
activation_490 (Activation)	(None, 6272)	0
reshape_120 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_239 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_245 (Conv2D)	(None, 14, 14, 64)	204864
activation_491 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_240 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_246 (Conv2D)	(None, 28, 28, 1)	1601
activation_492 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.111590
batch 1 g_loss : 2.746780
batch 2 d_loss : 0.081273
batch 2 g_loss : 2.757646
batch 3 d_loss : 0.059542
batch 3 g_loss : 2.740054
batch 4 d_loss : 0.119391
batch 4 g_loss : 2.726930
batch 5 d_loss : 0.090743
batch 5 g_loss : 2.797657
batch 6 d_loss : 0.126114
batch 6 g_loss : 2.696208
batch 7 d_loss : 0.120932
batch 7 g_loss : 2.799130

```

batch 8 d\_loss : 0.116145  
batch 8 g\_loss : 2.726644  
batch 9 d\_loss : 0.096335  
batch 9 g\_loss : 2.818198  
batch 10 d\_loss : 0.134385  
batch 10 g\_loss : 2.691586  
batch 11 d\_loss : 0.110457  
batch 11 g\_loss : 2.710537  
batch 12 d\_loss : 0.123928  
batch 12 g\_loss : 2.791211  
batch 13 d\_loss : 0.092449  
batch 13 g\_loss : 2.784701  
batch 14 d\_loss : 0.109934  
batch 14 g\_loss : 2.712125  
batch 15 d\_loss : 0.123399  
batch 15 g\_loss : 2.773530  
batch 16 d\_loss : 0.109130  
batch 16 g\_loss : 2.764693  
batch 17 d\_loss : 0.081283  
batch 17 g\_loss : 2.761178  
batch 18 d\_loss : 0.112586  
batch 18 g\_loss : 2.685219  
batch 19 d\_loss : 0.093817  
batch 19 g\_loss : 2.730289  
batch 20 d\_loss : 0.087120  
batch 20 g\_loss : 2.755982  
batch 21 d\_loss : 0.107648  
batch 21 g\_loss : 2.718768  
batch 22 d\_loss : 0.100686  
batch 22 g\_loss : 2.647296  
batch 23 d\_loss : 0.086661  
batch 23 g\_loss : 2.767671  
batch 24 d\_loss : 0.081800  
batch 24 g\_loss : 2.623092  
batch 25 d\_loss : 0.126695  
batch 25 g\_loss : 2.743943  
batch 26 d\_loss : 0.084028  
batch 26 g\_loss : 2.741379  
batch 27 d\_loss : 0.082852  
batch 27 g\_loss : 2.732102  
batch 28 d\_loss : 0.103188  
batch 28 g\_loss : 2.712226  
batch 29 d\_loss : 0.111546  
batch 29 g\_loss : 2.702450  
batch 30 d\_loss : 0.073395  
batch 30 g\_loss : 2.825025  
batch 31 d\_loss : 0.092983  
batch 31 g\_loss : 2.724315  
batch 32 d\_loss : 0.080637  
batch 32 g\_loss : 2.725209  
batch 33 d\_loss : 0.071198  
batch 33 g\_loss : 2.902542  
batch 34 d\_loss : 0.114614  
batch 34 g\_loss : 2.800730  
batch 35 d\_loss : 0.096773  
batch 35 g\_loss : 2.856381  
batch 36 d\_loss : 0.084442  
batch 36 g\_loss : 2.820526  
batch 37 d\_loss : 0.076805  
batch 37 g\_loss : 2.737466  
batch 38 d\_loss : 0.095759  
batch 38 g\_loss : 2.786344  
batch 39 d\_loss : 0.081378  
batch 39 g\_loss : 2.775505  
batch 40 d\_loss : 0.111900  
batch 40 g\_loss : 2.792051  
batch 41 d\_loss : 0.092514  
batch 41 g\_loss : 2.752213  
batch 42 d\_loss : 0.072532  
batch 42 g\_loss : 2.794014  
batch 43 d\_loss : 0.115479  
batch 43 g\_loss : 2.806822

batch 44 d\_loss : 0.073478  
batch 44 g\_loss : 2.777887  
batch 45 d\_loss : 0.069789  
batch 45 g\_loss : 2.764960  
batch 46 d\_loss : 0.098492  
batch 46 g\_loss : 2.703539  
batch 47 d\_loss : 0.100620  
batch 47 g\_loss : 2.765431  
batch 48 d\_loss : 0.117029  
batch 48 g\_loss : 2.802148  
batch 49 d\_loss : 0.100596  
batch 49 g\_loss : 2.845018  
batch 50 d\_loss : 0.122423  
batch 50 g\_loss : 2.805245  
batch 51 d\_loss : 0.092668  
batch 51 g\_loss : 2.726135  
batch 52 d\_loss : 0.089069  
batch 52 g\_loss : 2.807503  
batch 53 d\_loss : 0.053615  
batch 53 g\_loss : 2.782908  
batch 54 d\_loss : 0.101802  
batch 54 g\_loss : 2.719132  
batch 55 d\_loss : 0.113723  
batch 55 g\_loss : 2.795856  
batch 56 d\_loss : 0.079529  
batch 56 g\_loss : 2.775477  
batch 57 d\_loss : 0.078263  
batch 57 g\_loss : 2.707282  
batch 58 d\_loss : 0.101052  
batch 58 g\_loss : 2.809102  
batch 59 d\_loss : 0.083484  
batch 59 g\_loss : 2.736945  
batch 60 d\_loss : 0.093423  
batch 60 g\_loss : 2.761867  
batch 61 d\_loss : 0.104756  
batch 61 g\_loss : 2.726199  
batch 62 d\_loss : 0.146581  
batch 62 g\_loss : 2.795237  
batch 63 d\_loss : 0.080885  
batch 63 g\_loss : 2.829153  
batch 64 d\_loss : 0.080025  
batch 64 g\_loss : 2.781995  
batch 65 d\_loss : 0.085240  
batch 65 g\_loss : 2.781301  
batch 66 d\_loss : 0.121598  
batch 66 g\_loss : 2.787722  
batch 67 d\_loss : 0.084336  
batch 67 g\_loss : 2.800606  
batch 68 d\_loss : 0.125454  
batch 68 g\_loss : 2.817501  
batch 69 d\_loss : 0.109730  
batch 69 g\_loss : 2.722600  
batch 70 d\_loss : 0.104492  
batch 70 g\_loss : 2.777115  
batch 71 d\_loss : 0.074355  
batch 71 g\_loss : 2.747168  
batch 72 d\_loss : 0.119245  
batch 72 g\_loss : 2.760256  
batch 73 d\_loss : 0.089698  
batch 73 g\_loss : 2.747641  
batch 74 d\_loss : 0.075987  
batch 74 g\_loss : 2.881022  
batch 75 d\_loss : 0.131638  
batch 75 g\_loss : 2.682873  
batch 76 d\_loss : 0.089764  
batch 76 g\_loss : 2.762765  
batch 77 d\_loss : 0.091032  
batch 77 g\_loss : 2.781716  
batch 78 d\_loss : 0.115700  
batch 78 g\_loss : 2.748503  
batch 79 d\_loss : 0.082168  
batch 79 g\_loss : 2.756928

```

batch 80 d_loss : 0.101136
batch 80 g_loss : 2.808096
batch 81 d_loss : 0.110543
batch 81 g_loss : 2.722191
batch 82 d_loss : 0.104592
batch 82 g_loss : 2.782904
batch 83 d_loss : 0.076908
batch 83 g_loss : 2.787319
batch 84 d_loss : 0.082625
batch 84 g_loss : 2.686961
batch 85 d_loss : 0.116037
batch 85 g_loss : 2.766748
batch 86 d_loss : 0.075296
batch 86 g_loss : 2.750026
batch 87 d_loss : 0.094312
batch 87 g_loss : 2.668248
batch 88 d_loss : 0.081122
batch 88 g_loss : 2.766083
batch 89 d_loss : 0.071217
batch 89 g_loss : 2.881718
batch 90 d_loss : 0.084347
batch 90 g_loss : 2.704280
batch 91 d_loss : 0.086417
batch 91 g_loss : 2.762340
batch 92 d_loss : 0.115061
batch 92 g_loss : 2.833838
batch 93 d_loss : 0.076782
batch 93 g_loss : 2.808377
batch 94 d_loss : 0.105343
batch 94 g_loss : 2.790624
batch 95 d_loss : 0.076938
batch 95 g_loss : 2.729958
batch 96 d_loss : 0.101981
batch 96 g_loss : 2.735132
batch 97 d_loss : 0.085739
batch 97 g_loss : 2.714855
batch 98 d_loss : 0.072996
batch 98 g_loss : 2.681482
batch 99 d_loss : 0.093432
batch 99 g_loss : 2.749256
batch 100 d_loss : 0.075826
batch 100 g_loss : 2.797559

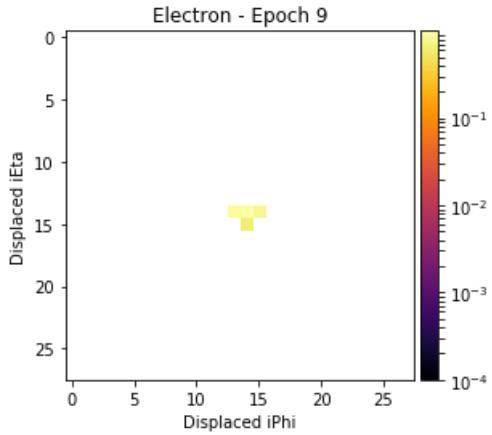
```

Layer (type)	Output Shape	Param #
dense_247 (Dense)	(None, 1024)	103424
activation_493 (Activation)	(None, 1024)	0
dense_248 (Dense)	(None, 6272)	6428800
batch_normalization_121 (Batch Normalization)	(None, 6272)	25088
activation_494 (Activation)	(None, 6272)	0
reshape_121 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_241 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_247 (Conv2D)	(None, 14, 14, 64)	204864
activation_495 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_242 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_248 (Conv2D)	(None, 28, 28, 1)	1601
activation_496 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544



```
batch 101 d_loss : 0.102744
batch 101 g_loss : 2.874424
batch 102 d_loss : 0.076335
batch 102 g_loss : 2.701324
batch 103 d_loss : 0.085635
batch 103 g_loss : 2.772139
batch 104 d_loss : 0.082597
batch 104 g_loss : 2.747588
batch 105 d_loss : 0.091866
batch 105 g_loss : 2.788008
batch 106 d_loss : 0.075232
batch 106 g_loss : 2.770278
batch 107 d_loss : 0.070918
batch 107 g_loss : 2.722797
batch 108 d_loss : 0.076184
batch 108 g_loss : 2.711051
batch 109 d_loss : 0.090303
batch 109 g_loss : 2.784768
batch 110 d_loss : 0.080271
batch 110 g_loss : 2.827589
batch 111 d_loss : 0.079196
batch 111 g_loss : 2.833681
batch 112 d_loss : 0.082044
batch 112 g_loss : 2.776729
batch 113 d_loss : 0.095403
batch 113 g_loss : 2.744579
batch 114 d_loss : 0.086328
batch 114 g_loss : 2.837649
batch 115 d_loss : 0.068585
batch 115 g_loss : 2.823800
batch 116 d_loss : 0.085854
batch 116 g_loss : 2.793202
batch 117 d_loss : 0.063521
batch 117 g_loss : 2.766206
batch 118 d_loss : 0.081450
batch 118 g_loss : 2.844556
batch 119 d_loss : 0.097242
batch 119 g_loss : 2.925121
batch 120 d_loss : 0.074652
batch 120 g_loss : 2.817057
batch 121 d_loss : 0.083686
batch 121 g_loss : 2.854588
batch 122 d_loss : 0.079066
batch 122 g_loss : 2.845325
batch 123 d_loss : 0.088222
batch 123 g_loss : 2.834766
batch 124 d_loss : 0.072521
batch 124 g_loss : 2.787339
batch 125 d_loss : 0.089749
batch 125 g_loss : 2.824030
batch 126 d_loss : 0.086839
batch 126 g_loss : 2.786110
batch 127 d_loss : 0.078293
```

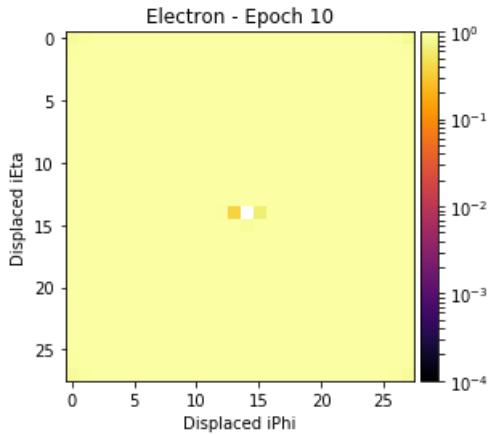
```

batch 127 u_loss : 0.070000
batch 127 g_loss : 2.847205
batch 128 d_loss : 0.099228
batch 128 g_loss : 2.915817
batch 129 d_loss : 0.080328
batch 129 g_loss : 2.849185
Epoch is 10
Number of batches 130
batch 0 d_loss : 0.056149
batch 0 g_loss : 2.965377

```

Layer (type)	Output Shape	Param #
dense_249 (Dense)	(None, 1024)	103424
activation_497 (Activation)	(None, 1024)	0
dense_250 (Dense)	(None, 6272)	6428800
batch_normalization_122 (Batch Normalization)	(None, 6272)	25088
activation_498 (Activation)	(None, 6272)	0
reshape_122 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_243 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_249 (Conv2D)	(None, 14, 14, 64)	204864
activation_499 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_244 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_250 (Conv2D)	(None, 28, 28, 1)	1601
activation_500 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.094568
batch 1 g_loss : 2.915777
batch 2 d_loss : 0.070404
batch 2 g_loss : 2.922300
batch 3 d_loss : 0.050997
batch 3 g_loss : 2.950026
batch 4 d_loss : 0.100739
batch 4 g_loss : 2.941501
batch 5 d_loss : 0.078282
batch 5 g_loss : 2.830634
batch 6 d_loss : 0.105799
batch 6 g_loss : 2.877413
batch 7 d_loss : 0.103135

```

batch 7 g\_loss : 2.919497  
batch 8 d\_loss : 0.097773  
batch 8 g\_loss : 2.916720  
batch 9 d\_loss : 0.081517  
batch 9 g\_loss : 2.885871  
batch 10 d\_loss : 0.113415  
batch 10 g\_loss : 2.849553  
batch 11 d\_loss : 0.092605  
batch 11 g\_loss : 2.858350  
batch 12 d\_loss : 0.103758  
batch 12 g\_loss : 2.901019  
batch 13 d\_loss : 0.078403  
batch 13 g\_loss : 2.909361  
batch 14 d\_loss : 0.092341  
batch 14 g\_loss : 2.779514  
batch 15 d\_loss : 0.102950  
batch 15 g\_loss : 2.911996  
batch 16 d\_loss : 0.091010  
batch 16 g\_loss : 2.833857  
batch 17 d\_loss : 0.070420  
batch 17 g\_loss : 2.912358  
batch 18 d\_loss : 0.095284  
batch 18 g\_loss : 2.947930  
batch 19 d\_loss : 0.079260  
batch 19 g\_loss : 2.828947  
batch 20 d\_loss : 0.074389  
batch 20 g\_loss : 2.761047  
batch 21 d\_loss : 0.090350  
batch 21 g\_loss : 2.929873  
batch 22 d\_loss : 0.084116  
batch 22 g\_loss : 2.856662  
batch 23 d\_loss : 0.073940  
batch 23 g\_loss : 2.782478  
batch 24 d\_loss : 0.070392  
batch 24 g\_loss : 2.909412  
batch 25 d\_loss : 0.107119  
batch 25 g\_loss : 2.884828  
batch 26 d\_loss : 0.071102  
batch 26 g\_loss : 2.843930  
batch 27 d\_loss : 0.069863  
batch 27 g\_loss : 2.913222  
batch 28 d\_loss : 0.088549  
batch 28 g\_loss : 2.890649  
batch 29 d\_loss : 0.095358  
batch 29 g\_loss : 2.890389  
batch 30 d\_loss : 0.063284  
batch 30 g\_loss : 2.889847  
batch 31 d\_loss : 0.079281  
batch 31 g\_loss : 2.858096  
batch 32 d\_loss : 0.069476  
batch 32 g\_loss : 2.892169  
batch 33 d\_loss : 0.060799  
batch 33 g\_loss : 3.005116  
batch 34 d\_loss : 0.096387  
batch 34 g\_loss : 2.853168  
batch 35 d\_loss : 0.081302  
batch 35 g\_loss : 2.877453  
batch 36 d\_loss : 0.072122  
batch 36 g\_loss : 2.836236  
batch 37 d\_loss : 0.065076  
batch 37 g\_loss : 2.843829  
batch 38 d\_loss : 0.081209  
batch 38 g\_loss : 2.782426  
batch 39 d\_loss : 0.069953  
batch 39 g\_loss : 2.872967  
batch 40 d\_loss : 0.093528  
batch 40 g\_loss : 2.857999  
batch 41 d\_loss : 0.076250  
batch 41 g\_loss : 2.926723  
batch 42 d\_loss : 0.062462  
batch 42 g\_loss : 2.874405  
batch 43 d\_loss : 0.097341

batch 43 g\_loss : 2.855321  
batch 44 d\_loss : 0.063073  
batch 44 g\_loss : 2.895348  
batch 45 d\_loss : 0.059872  
batch 45 g\_loss : 2.879407  
batch 46 d\_loss : 0.083124  
batch 46 g\_loss : 2.884657  
batch 47 d\_loss : 0.084224  
batch 47 g\_loss : 2.851495  
batch 48 d\_loss : 0.096869  
batch 48 g\_loss : 2.877761  
batch 49 d\_loss : 0.084288  
batch 49 g\_loss : 3.037483  
batch 50 d\_loss : 0.101718  
batch 50 g\_loss : 2.987479  
batch 51 d\_loss : 0.078772  
batch 51 g\_loss : 2.894802  
batch 52 d\_loss : 0.074892  
batch 52 g\_loss : 2.901078  
batch 53 d\_loss : 0.046281  
batch 53 g\_loss : 2.904114  
batch 54 d\_loss : 0.085876  
batch 54 g\_loss : 2.952352  
batch 55 d\_loss : 0.094288  
batch 55 g\_loss : 2.954700  
batch 56 d\_loss : 0.067839  
batch 56 g\_loss : 2.828505  
batch 57 d\_loss : 0.065516  
batch 57 g\_loss : 2.923562  
batch 58 d\_loss : 0.084764  
batch 58 g\_loss : 2.909416  
batch 59 d\_loss : 0.070472  
batch 59 g\_loss : 2.901340  
batch 60 d\_loss : 0.078282  
batch 60 g\_loss : 2.869043  
batch 61 d\_loss : 0.086796  
batch 61 g\_loss : 2.955436  
batch 62 d\_loss : 0.121055  
batch 62 g\_loss : 2.902735  
batch 63 d\_loss : 0.067118  
batch 63 g\_loss : 2.954405  
batch 64 d\_loss : 0.067267  
batch 64 g\_loss : 2.951494  
batch 65 d\_loss : 0.070012  
batch 65 g\_loss : 2.922305  
batch 66 d\_loss : 0.100336  
batch 66 g\_loss : 2.818622  
batch 67 d\_loss : 0.070833  
batch 67 g\_loss : 2.935702  
batch 68 d\_loss : 0.101846  
batch 68 g\_loss : 2.903153  
batch 69 d\_loss : 0.091335  
batch 69 g\_loss : 2.887392  
batch 70 d\_loss : 0.085391  
batch 70 g\_loss : 2.861819  
batch 71 d\_loss : 0.063232  
batch 71 g\_loss : 2.856500  
batch 72 d\_loss : 0.097132  
batch 72 g\_loss : 2.939698  
batch 73 d\_loss : 0.074085  
batch 73 g\_loss : 2.900827  
batch 74 d\_loss : 0.064260  
batch 74 g\_loss : 2.884873  
batch 75 d\_loss : 0.106513  
batch 75 g\_loss : 2.908067  
batch 76 d\_loss : 0.074945  
batch 76 g\_loss : 2.997104  
batch 77 d\_loss : 0.074049  
batch 77 g\_loss : 2.850034  
batch 78 d\_loss : 0.094633  
batch 78 g\_loss : 2.961224  
batch 79 d\_loss : 0.068921

batch 79 g\_loss : 2.827572  
 batch 80 d\_loss : 0.084053  
 batch 80 g\_loss : 2.879572  
 batch 81 d\_loss : 0.090678  
 batch 81 g\_loss : 2.797619  
 batch 82 d\_loss : 0.086238  
 batch 82 g\_loss : 2.892668  
 batch 83 d\_loss : 0.063121  
 batch 83 g\_loss : 2.957486  
 batch 84 d\_loss : 0.069485  
 batch 84 g\_loss : 2.880403  
 batch 85 d\_loss : 0.095716  
 batch 85 g\_loss : 2.914130  
 batch 86 d\_loss : 0.063450  
 batch 86 g\_loss : 2.871953  
 batch 87 d\_loss : 0.076387  
 batch 87 g\_loss : 2.825921  
 batch 88 d\_loss : 0.068302  
 batch 88 g\_loss : 2.892549  
 batch 89 d\_loss : 0.059011  
 batch 89 g\_loss : 2.881963  
 batch 90 d\_loss : 0.068471  
 batch 90 g\_loss : 2.820810  
 batch 91 d\_loss : 0.071599  
 batch 91 g\_loss : 2.929206  
 batch 92 d\_loss : 0.093319  
 batch 92 g\_loss : 2.911875  
 batch 93 d\_loss : 0.064866  
 batch 93 g\_loss : 2.887695  
 batch 94 d\_loss : 0.085745  
 batch 94 g\_loss : 2.881813  
 batch 95 d\_loss : 0.063042  
 batch 95 g\_loss : 2.880475  
 batch 96 d\_loss : 0.084443  
 batch 96 g\_loss : 2.927278  
 batch 97 d\_loss : 0.070629  
 batch 97 g\_loss : 2.971606  
 batch 98 d\_loss : 0.059968  
 batch 98 g\_loss : 2.884200  
 batch 99 d\_loss : 0.076458  
 batch 99 g\_loss : 2.878195  
 batch 100 d\_loss : 0.062669  
 batch 100 g\_loss : 2.912145

Layer (type)	Output Shape	Param #
dense_251 (Dense)	(None, 1024)	103424
activation_501 (Activation)	(None, 1024)	0
dense_252 (Dense)	(None, 6272)	6428800
batch_normalization_123 (Batch Normalization)	(None, 6272)	25088
activation_502 (Activation)	(None, 6272)	0
reshape_123 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_245 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_251 (Conv2D)	(None, 14, 14, 64)	204864
activation_503 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_246 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_252 (Conv2D)	(None, 28, 28, 1)	1601
activation_504 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544

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```
batch 101 d_loss : 0.084306
batch 101 g_loss : 2.949708
batch 102 d_loss : 0.063939
batch 102 g_loss : 2.940667
batch 103 d_loss : 0.069090
batch 103 g_loss : 2.954475
batch 104 d_loss : 0.068632
batch 104 g_loss : 2.875782
batch 105 d_loss : 0.074578
batch 105 g_loss : 2.923312
batch 106 d_loss : 0.063071
batch 106 g_loss : 2.954162
batch 107 d_loss : 0.059137
batch 107 g_loss : 2.865622
batch 108 d_loss : 0.062670
batch 108 g_loss : 3.017385
batch 109 d_loss : 0.073764
batch 109 g_loss : 2.869345
batch 110 d_loss : 0.065480
batch 110 g_loss : 2.927843
batch 111 d_loss : 0.066327
batch 111 g_loss : 2.870937
batch 112 d_loss : 0.067286
batch 112 g_loss : 3.024467
batch 113 d_loss : 0.076554
batch 113 g_loss : 2.916717
batch 114 d_loss : 0.070597
batch 114 g_loss : 3.108897
batch 115 d_loss : 0.056804
batch 115 g_loss : 2.916783
batch 116 d_loss : 0.070392
batch 116 g_loss : 2.940957
batch 117 d_loss : 0.054028
batch 117 g_loss : 2.849421
batch 118 d_loss : 0.066774
batch 118 g_loss : 2.887579
batch 119 d_loss : 0.078981
batch 119 g_loss : 2.875166
batch 120 d_loss : 0.061925
batch 120 g_loss : 2.905893
batch 121 d_loss : 0.066412
batch 121 g_loss : 3.008886
batch 122 d_loss : 0.064908
batch 122 g_loss : 2.940986
batch 123 d_loss : 0.071066
batch 123 g_loss : 3.132551
batch 124 d_loss : 0.058772
batch 124 g_loss : 2.933295
batch 125 d_loss : 0.071725
batch 125 g_loss : 3.010826
batch 126 d_loss : 0.070664
```

```

batch 126 g_loss : 3.000598/
batch 127 d_loss : 0.064481
batch 127 g_loss : 2.936449
batch 128 d_loss : 0.078376
batch 128 g_loss : 3.085771
batch 129 d_loss : 0.064223
batch 129 g_loss : 3.018674
Epoch is 11
Number of batches 130
batch 0 d_loss : 0.046331
batch 0 g_loss : 3.009813

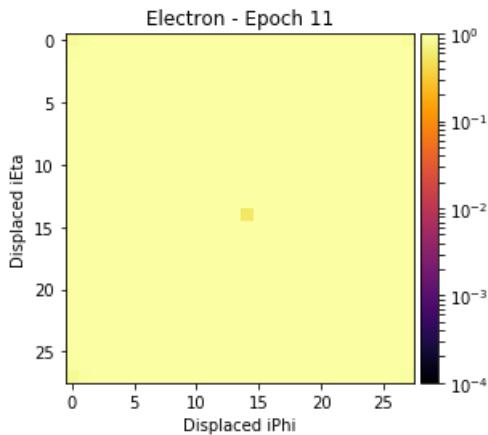
```

Layer (type)	Output Shape	Param #
dense_253 (Dense)	(None, 1024)	103424
activation_505 (Activation)	(None, 1024)	0
dense_254 (Dense)	(None, 6272)	6428800
batch_normalization_124 (Batch Normalization)	(None, 6272)	25088
activation_506 (Activation)	(None, 6272)	0
reshape_124 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_247 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_253 (Conv2D)	(None, 14, 14, 64)	204864
activation_507 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_248 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_254 (Conv2D)	(None, 28, 28, 1)	1601
activation_508 (Activation)	(None, 28, 28, 1)	0

```

Total params: 6,763,777
Trainable params: 6,751,233
Non-trainable params: 12,544

```



```

batch 1 d_loss : 0.074773
batch 1 g_loss : 2.935429
batch 2 d_loss : 0.058168
batch 2 g_loss : 2.951798
batch 3 d_loss : 0.043158
batch 3 g_loss : 3.019948
batch 4 d_loss : 0.079911
batch 4 g_loss : 2.996311
batch 5 d_loss : 0.061673
batch 5 g_loss : 2.992284
batch 6 d_loss : 0.085490
batch 6 g_loss : 2.883371

```

```
batch 7 d_loss : 0.082297
batch 7 g_loss : 2.957240
batch 8 d_loss : 0.078354
batch 8 g_loss : 2.974281
batch 9 d_loss : 0.065857
batch 9 g_loss : 3.037701
batch 10 d_loss : 0.089293
batch 10 g_loss : 2.995655
batch 11 d_loss : 0.073975
batch 11 g_loss : 3.006605
batch 12 d_loss : 0.083093
batch 12 g_loss : 3.081661
batch 13 d_loss : 0.062462
batch 13 g_loss : 2.896006
batch 14 d_loss : 0.072621
batch 14 g_loss : 2.977883
batch 15 d_loss : 0.082667
batch 15 g_loss : 2.986107
batch 16 d_loss : 0.073681
batch 16 g_loss : 2.921769
batch 17 d_loss : 0.055308
batch 17 g_loss : 2.924131
batch 18 d_loss : 0.074760
batch 18 g_loss : 2.871194
batch 19 d_loss : 0.063900
batch 19 g_loss : 2.952298
batch 20 d_loss : 0.060648
batch 20 g_loss : 3.021314
batch 21 d_loss : 0.072515
batch 21 g_loss : 3.049152
batch 22 d_loss : 0.067134
batch 22 g_loss : 2.945838
batch 23 d_loss : 0.059583
batch 23 g_loss : 2.907858
batch 24 d_loss : 0.057572
batch 24 g_loss : 2.972055
batch 25 d_loss : 0.083728
batch 25 g_loss : 2.990354
batch 26 d_loss : 0.057204
batch 26 g_loss : 2.951908
batch 27 d_loss : 0.057702
batch 27 g_loss : 2.953272
batch 28 d_loss : 0.068188
batch 28 g_loss : 2.949559
batch 29 d_loss : 0.074097
batch 29 g_loss : 2.860235
batch 30 d_loss : 0.050790
batch 30 g_loss : 2.930058
batch 31 d_loss : 0.062435
batch 31 g_loss : 2.885990
batch 32 d_loss : 0.054356
batch 32 g_loss : 2.924380
batch 33 d_loss : 0.049095
batch 33 g_loss : 2.990386
batch 34 d_loss : 0.075557
batch 34 g_loss : 2.944080
batch 35 d_loss : 0.063736
batch 35 g_loss : 2.939248
batch 36 d_loss : 0.055575
batch 36 g_loss : 2.912311
batch 37 d_loss : 0.052125
batch 37 g_loss : 2.913896
batch 38 d_loss : 0.064724
batch 38 g_loss : 3.070268
batch 39 d_loss : 0.055322
batch 39 g_loss : 2.977736
batch 40 d_loss : 0.072156
batch 40 g_loss : 3.066558
batch 41 d_loss : 0.061906
batch 41 g_loss : 3.030370
batch 42 d_loss : 0.049615
batch 42 g_loss : 2.991569
```

batch 43 d\_loss : 0.075928  
batch 43 g\_loss : 3.065157  
batch 44 d\_loss : 0.051453  
batch 44 g\_loss : 3.039253  
batch 45 d\_loss : 0.049493  
batch 45 g\_loss : 2.974302  
batch 46 d\_loss : 0.066023  
batch 46 g\_loss : 3.078610  
batch 47 d\_loss : 0.067205  
batch 47 g\_loss : 2.970374  
batch 48 d\_loss : 0.076069  
batch 48 g\_loss : 3.068855  
batch 49 d\_loss : 0.066392  
batch 49 g\_loss : 3.003619  
batch 50 d\_loss : 0.078980  
batch 50 g\_loss : 3.039329  
batch 51 d\_loss : 0.060135  
batch 51 g\_loss : 3.076054  
batch 52 d\_loss : 0.059070  
batch 52 g\_loss : 3.085213  
batch 53 d\_loss : 0.038252  
batch 53 g\_loss : 2.905025  
batch 54 d\_loss : 0.066588  
batch 54 g\_loss : 3.040075  
batch 55 d\_loss : 0.073625  
batch 55 g\_loss : 3.019666  
batch 56 d\_loss : 0.053281  
batch 56 g\_loss : 3.055903  
batch 57 d\_loss : 0.052691  
batch 57 g\_loss : 3.169716  
batch 58 d\_loss : 0.066691  
batch 58 g\_loss : 2.961939  
batch 59 d\_loss : 0.054988  
batch 59 g\_loss : 3.000010  
batch 60 d\_loss : 0.061245  
batch 60 g\_loss : 3.011569  
batch 61 d\_loss : 0.066818  
batch 61 g\_loss : 3.079453  
batch 62 d\_loss : 0.092777  
batch 62 g\_loss : 3.028842  
batch 63 d\_loss : 0.052970  
batch 63 g\_loss : 3.001902  
batch 64 d\_loss : 0.052783  
batch 64 g\_loss : 2.993268  
batch 65 d\_loss : 0.055980  
batch 65 g\_loss : 3.115993  
batch 66 d\_loss : 0.077300  
batch 66 g\_loss : 3.057553  
batch 67 d\_loss : 0.054674  
batch 67 g\_loss : 2.977791  
batch 68 d\_loss : 0.079847  
batch 68 g\_loss : 2.974425  
batch 69 d\_loss : 0.069677  
batch 69 g\_loss : 3.103568  
batch 70 d\_loss : 0.067762  
batch 70 g\_loss : 3.024281  
batch 71 d\_loss : 0.048987  
batch 71 g\_loss : 3.156646  
batch 72 d\_loss : 0.075504  
batch 72 g\_loss : 2.948900  
batch 73 d\_loss : 0.057340  
batch 73 g\_loss : 2.946729  
batch 74 d\_loss : 0.050129  
batch 74 g\_loss : 3.032745  
batch 75 d\_loss : 0.083275  
batch 75 g\_loss : 3.061699  
batch 76 d\_loss : 0.058717  
batch 76 g\_loss : 3.049142  
batch 77 d\_loss : 0.057038  
batch 77 g\_loss : 3.080201  
batch 78 d\_loss : 0.073082  
batch 78 q\_loss : 3.023620

```

batch 79 d_loss : 0.054755
batch 79 g_loss : 3.024954
batch 80 d_loss : 0.065539
batch 80 g_loss : 2.973554
batch 81 d_loss : 0.069945
batch 81 g_loss : 3.061038
batch 82 d_loss : 0.066294
batch 82 g_loss : 2.985867
batch 83 d_loss : 0.050255
batch 83 g_loss : 3.013676
batch 84 d_loss : 0.054748
batch 84 g_loss : 2.965081
batch 85 d_loss : 0.073987
batch 85 g_loss : 2.956797
batch 86 d_loss : 0.050696
batch 86 g_loss : 3.021456
batch 87 d_loss : 0.060112
batch 87 g_loss : 3.054659
batch 88 d_loss : 0.053224
batch 88 g_loss : 3.045386
batch 89 d_loss : 0.046797
batch 89 g_loss : 3.103968
batch 90 d_loss : 0.053563
batch 90 g_loss : 2.962765
batch 91 d_loss : 0.055523
batch 91 g_loss : 3.011638
batch 92 d_loss : 0.071211
batch 92 g_loss : 3.130790
batch 93 d_loss : 0.050186
batch 93 g_loss : 3.030785
batch 94 d_loss : 0.066980
batch 94 g_loss : 3.009244
batch 95 d_loss : 0.049984
batch 95 g_loss : 3.002897
batch 96 d_loss : 0.065371
batch 96 g_loss : 2.940274
batch 97 d_loss : 0.054693
batch 97 g_loss : 3.031083
batch 98 d_loss : 0.048505
batch 98 g_loss : 3.003305
batch 99 d_loss : 0.058327
batch 99 g_loss : 3.109356
batch 100 d_loss : 0.049420
batch 100 g_loss : 3.204584

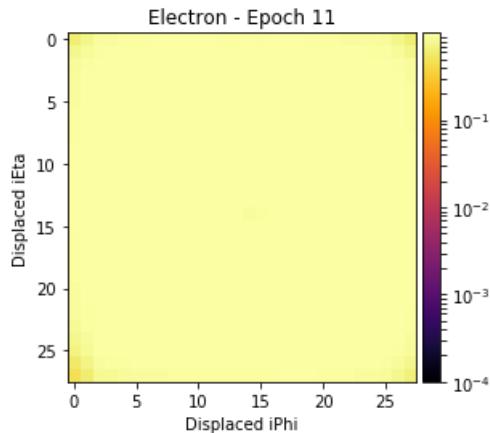
```

Layer (type)	Output Shape	Param #
dense_255 (Dense)	(None, 1024)	103424
activation_509 (Activation)	(None, 1024)	0
dense_256 (Dense)	(None, 6272)	6428800
batch_normalization_125 (Batch Normalization)	(None, 6272)	25088
activation_510 (Activation)	(None, 6272)	0
reshape_125 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_249 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_255 (Conv2D)	(None, 14, 14, 64)	204864
activation_511 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_250 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_256 (Conv2D)	(None, 28, 28, 1)	1601
activation_512 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233  
Non-trainable params: 12,544

---



```
batch 101 d_loss : 0.063777
batch 101 g_loss : 3.150782
batch 102 d_loss : 0.049523
batch 102 g_loss : 3.061466
batch 103 d_loss : 0.054268
batch 103 g_loss : 3.209940
batch 104 d_loss : 0.052997
batch 104 g_loss : 3.008422
batch 105 d_loss : 0.058013
batch 105 g_loss : 3.164690
batch 106 d_loss : 0.049099
batch 106 g_loss : 3.162690
batch 107 d_loss : 0.046234
batch 107 g_loss : 3.252746
batch 108 d_loss : 0.049325
batch 108 g_loss : 3.057386
batch 109 d_loss : 0.056650
batch 109 g_loss : 2.999733
batch 110 d_loss : 0.050370
batch 110 g_loss : 3.105656
batch 111 d_loss : 0.051014
batch 111 g_loss : 3.025838
batch 112 d_loss : 0.052317
batch 112 g_loss : 3.017744
batch 113 d_loss : 0.058674
batch 113 g_loss : 3.124918
batch 114 d_loss : 0.055020
batch 114 g_loss : 3.237973
batch 115 d_loss : 0.044792
batch 115 g_loss : 3.132897
batch 116 d_loss : 0.053911
batch 116 g_loss : 3.111654
batch 117 d_loss : 0.042411
batch 117 g_loss : 3.090215
batch 118 d_loss : 0.051183
batch 118 g_loss : 3.120570
batch 119 d_loss : 0.060305
batch 119 g_loss : 3.044705
batch 120 d_loss : 0.047746
batch 120 g_loss : 3.270413
batch 121 d_loss : 0.051675
batch 121 g_loss : 3.136935
batch 122 d_loss : 0.050229
batch 122 g_loss : 3.113933
batch 123 d_loss : 0.055092
batch 123 g_loss : 3.168504
batch 124 d_loss : 0.045887
batch 124 g_loss : 3.185620
batch 125 d_loss : 0.055562
batch 125 g_loss : 3.120600
```

```

batch 126 d_loss : 0.053822
batch 126 g_loss : 3.087775
batch 127 d_loss : 0.050481
batch 127 g_loss : 3.194694
batch 128 d_loss : 0.060313
batch 128 g_loss : 3.171258
batch 129 d_loss : 0.049311
batch 129 g_loss : 3.235256
Epoch is 12
Number of batches 130
batch 0 d_loss : 0.036281
batch 0 g_loss : 3.168623

```

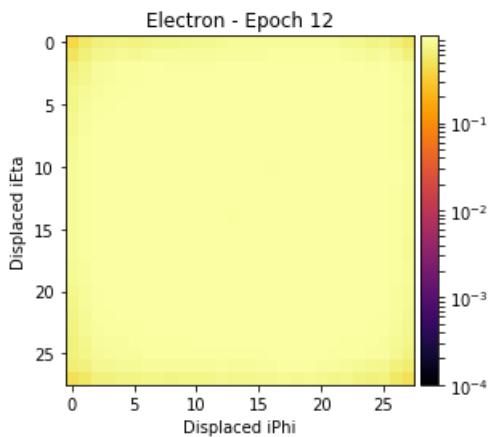
Layer (type)	Output Shape	Param #
<hr/>		
dense_257 (Dense)	(None, 1024)	103424
activation_513 (Activation)	(None, 1024)	0
dense_258 (Dense)	(None, 6272)	6428800
batch_normalization_126 (Batch Normalization)	(None, 6272)	25088
activation_514 (Activation)	(None, 6272)	0
reshape_126 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_251 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_257 (Conv2D)	(None, 14, 14, 64)	204864
activation_515 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_252 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_258 (Conv2D)	(None, 28, 28, 1)	1601
activation_516 (Activation)	(None, 28, 28, 1)	0
<hr/>		

```

Total params: 6,763,777
Trainable params: 6,751,233
Non-trainable params: 12,544

```

---



```

batch 1 d_loss : 0.057556
batch 1 g_loss : 3.179913
batch 2 d_loss : 0.044309
batch 2 g_loss : 3.184549
batch 3 d_loss : 0.034924
batch 3 g_loss : 3.147369
batch 4 d_loss : 0.060597
batch 4 g_loss : 3.134905
batch 5 d_loss : 0.048783
batch 5 g_loss : 3.140641
batch 6 d_loss : 0.063132

```

batch 5 g\_loss : 3.255152  
batch 6 g\_loss : 3.258037  
batch 7 d\_loss : 0.061485  
batch 7 g\_loss : 3.199405  
batch 8 d\_loss : 0.060080  
batch 8 g\_loss : 3.148626  
batch 9 d\_loss : 0.049940  
batch 9 g\_loss : 3.142048  
batch 10 d\_loss : 0.066673  
batch 10 g\_loss : 3.137988  
batch 11 d\_loss : 0.055932  
batch 11 g\_loss : 3.100449  
batch 12 d\_loss : 0.062729  
batch 12 g\_loss : 3.317723  
batch 13 d\_loss : 0.049223  
batch 13 g\_loss : 3.258026  
batch 14 d\_loss : 0.054907  
batch 14 g\_loss : 3.060372  
batch 15 d\_loss : 0.062951  
batch 15 g\_loss : 3.222229  
batch 16 d\_loss : 0.056162  
batch 16 g\_loss : 3.156389  
batch 17 d\_loss : 0.042891  
batch 17 g\_loss : 3.158578  
batch 18 d\_loss : 0.056522  
batch 18 g\_loss : 3.152563  
batch 19 d\_loss : 0.047636  
batch 19 g\_loss : 3.183442  
batch 20 d\_loss : 0.045615  
batch 20 g\_loss : 3.088169  
batch 21 d\_loss : 0.055099  
batch 21 g\_loss : 3.164612  
batch 22 d\_loss : 0.052141  
batch 22 g\_loss : 3.107554  
batch 23 d\_loss : 0.046480  
batch 23 g\_loss : 3.087898  
batch 24 d\_loss : 0.042573  
batch 24 g\_loss : 3.337430  
batch 25 d\_loss : 0.062443  
batch 25 g\_loss : 3.070423  
batch 26 d\_loss : 0.044306  
batch 26 g\_loss : 3.312356  
batch 27 d\_loss : 0.042939  
batch 27 g\_loss : 3.120024  
batch 28 d\_loss : 0.052324  
batch 28 g\_loss : 3.140848  
batch 29 d\_loss : 0.055953  
batch 29 g\_loss : 3.186386  
batch 30 d\_loss : 0.039195  
batch 30 g\_loss : 3.266732  
batch 31 d\_loss : 0.047980  
batch 31 g\_loss : 3.164832  
batch 32 d\_loss : 0.042719  
batch 32 g\_loss : 3.212387  
batch 33 d\_loss : 0.038675  
batch 33 g\_loss : 3.132196  
batch 34 d\_loss : 0.056600  
batch 34 g\_loss : 3.258133  
batch 35 d\_loss : 0.048209  
batch 35 g\_loss : 3.238403  
batch 36 d\_loss : 0.043105  
batch 36 g\_loss : 3.168078  
batch 37 d\_loss : 0.041035  
batch 37 g\_loss : 3.244291  
batch 38 d\_loss : 0.049280  
batch 38 g\_loss : 3.260231  
batch 39 d\_loss : 0.042793  
batch 39 g\_loss : 3.168188  
batch 40 d\_loss : 0.055011  
batch 40 g\_loss : 3.258306  
batch 41 d\_loss : 0.046558  
batch 41 g\_loss : 3.182611  
batch 42 d\_loss : 0.039284

```
batch 42 g_loss : 3.227808
batch 43 d_loss : 0.055435
batch 43 g_loss : 3.091043
batch 44 d_loss : 0.039011
batch 44 g_loss : 3.252509
batch 45 d_loss : 0.037940
batch 45 g_loss : 3.354218
batch 46 d_loss : 0.049604
batch 46 g_loss : 3.207363
batch 47 d_loss : 0.049990
batch 47 g_loss : 3.318954
batch 48 d_loss : 0.056975
batch 48 g_loss : 3.243374
batch 49 d_loss : 0.049422
batch 49 g_loss : 3.212938
batch 50 d_loss : 0.058465
batch 50 g_loss : 3.207182
batch 51 d_loss : 0.045462
batch 51 g_loss : 3.270216
batch 52 d_loss : 0.045433
batch 52 g_loss : 3.259389
batch 53 d_loss : 0.029498
batch 53 g_loss : 3.243387
batch 54 d_loss : 0.050337
batch 54 g_loss : 3.210946
batch 55 d_loss : 0.055473
batch 55 g_loss : 3.233240
batch 56 d_loss : 0.041073
batch 56 g_loss : 3.202575
batch 57 d_loss : 0.039675
batch 57 g_loss : 3.264860
batch 58 d_loss : 0.049545
batch 58 g_loss : 3.306923
batch 59 d_loss : 0.042554
batch 59 g_loss : 3.165961
batch 60 d_loss : 0.046235
batch 60 g_loss : 3.192380
batch 61 d_loss : 0.050408
batch 61 g_loss : 3.228020
batch 62 d_loss : 0.067459
batch 62 g_loss : 3.233614
batch 63 d_loss : 0.040701
batch 63 g_loss : 3.308785
batch 64 d_loss : 0.041150
batch 64 g_loss : 3.304315
batch 65 d_loss : 0.042578
batch 65 g_loss : 3.348051
batch 66 d_loss : 0.057235
batch 66 g_loss : 3.243247
batch 67 d_loss : 0.042199
batch 67 g_loss : 3.188513
batch 68 d_loss : 0.059338
batch 68 g_loss : 3.278956
batch 69 d_loss : 0.052596
batch 69 g_loss : 3.224030
batch 70 d_loss : 0.048783
batch 70 g_loss : 3.311525
batch 71 d_loss : 0.038561
batch 71 g_loss : 3.244663
batch 72 d_loss : 0.054335
batch 72 g_loss : 3.291314
batch 73 d_loss : 0.043691
batch 73 g_loss : 3.186456
batch 74 d_loss : 0.037666
batch 74 g_loss : 3.268242
batch 75 d_loss : 0.060036
batch 75 g_loss : 3.239985
batch 76 d_loss : 0.043038
batch 76 g_loss : 3.235458
batch 77 d_loss : 0.043045
batch 77 g_loss : 3.275407
batch 78 d_loss : 0.053266
```

```
batch 78 g_loss : 3.259763
batch 79 d_loss : 0.041161
batch 79 g_loss : 3.213366
batch 80 d_loss : 0.048574
batch 80 g_loss : 3.266881
batch 81 d_loss : 0.051641
batch 81 g_loss : 3.267691
batch 82 d_loss : 0.048802
batch 82 g_loss : 3.343822
batch 83 d_loss : 0.037110
batch 83 g_loss : 3.271116
batch 84 d_loss : 0.040370
batch 84 g_loss : 3.246847
batch 85 d_loss : 0.054682
batch 85 g_loss : 3.294424
batch 86 d_loss : 0.037401
batch 86 g_loss : 3.310453
batch 87 d_loss : 0.044531
batch 87 g_loss : 3.319761
batch 88 d_loss : 0.039484
batch 88 g_loss : 3.398960
batch 89 d_loss : 0.035637
batch 89 g_loss : 3.271553
batch 90 d_loss : 0.040418
batch 90 g_loss : 3.285769
batch 91 d_loss : 0.041045
batch 91 g_loss : 3.457572
batch 92 d_loss : 0.050987
batch 92 g_loss : 3.308550
batch 93 d_loss : 0.037516
batch 93 g_loss : 3.196038
batch 94 d_loss : 0.048680
batch 94 g_loss : 3.247436
batch 95 d_loss : 0.037975
batch 95 g_loss : 3.455430
batch 96 d_loss : 0.046856
batch 96 g_loss : 3.271757
batch 97 d_loss : 0.040968
batch 97 g_loss : 3.291473
batch 98 d_loss : 0.035668
batch 98 g_loss : 3.352390
batch 99 d_loss : 0.044121
batch 99 g_loss : 3.347954
batch 100 d_loss : 0.036608
batch 100 g_loss : 3.282106
```

Layer (type)	Output Shape	Param #
dense_259 (Dense)	(None, 1024)	103424
activation_517 (Activation)	(None, 1024)	0
dense_260 (Dense)	(None, 6272)	6428800
batch_normalization_127 (Batch Normalization)	(None, 6272)	25088
activation_518 (Activation)	(None, 6272)	0
reshape_127 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_253 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_259 (Conv2D)	(None, 14, 14, 64)	204864
activation_519 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_254 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_260 (Conv2D)	(None, 28, 28, 1)	1601
activation_520 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544

---

```
batch 101 d_loss : 0.047246
batch 101 g_loss : 3.280617
batch 102 d_loss : 0.037472
batch 102 g_loss : 3.265695
batch 103 d_loss : 0.040211
batch 103 g_loss : 3.432530
batch 104 d_loss : 0.039041
batch 104 g_loss : 3.294368
batch 105 d_loss : 0.042962
batch 105 g_loss : 3.389062
batch 106 d_loss : 0.037213
batch 106 g_loss : 3.316958
batch 107 d_loss : 0.035120
batch 107 g_loss : 3.321256
batch 108 d_loss : 0.036710
batch 108 g_loss : 3.449784
batch 109 d_loss : 0.041776
batch 109 g_loss : 3.378860
batch 110 d_loss : 0.038541
batch 110 g_loss : 3.409470
batch 111 d_loss : 0.037602
batch 111 g_loss : 3.258900
batch 112 d_loss : 0.037687
batch 112 g_loss : 3.343672
batch 113 d_loss : 0.043158
batch 113 g_loss : 3.373386
batch 114 d_loss : 0.038973
batch 114 g_loss : 3.388439
batch 115 d_loss : 0.033596
batch 115 g_loss : 3.288430
batch 116 d_loss : 0.040560
batch 116 g_loss : 3.373891
batch 117 d_loss : 0.031449
batch 117 g_loss : 3.404710
batch 118 d_loss : 0.038340
batch 118 g_loss : 3.513026
batch 119 d_loss : 0.044694
batch 119 g_loss : 3.376636
batch 120 d_loss : 0.035698
batch 120 g_loss : 3.356880
batch 121 d_loss : 0.038260
batch 121 g_loss : 3.501203
batch 122 d_loss : 0.036326
batch 122 g_loss : 3.404300
batch 123 d_loss : 0.040274
batch 123 g_loss : 3.448004
batch 124 d_loss : 0.034021
batch 124 g_loss : 3.458344
batch 125 d_loss : 0.040649
```

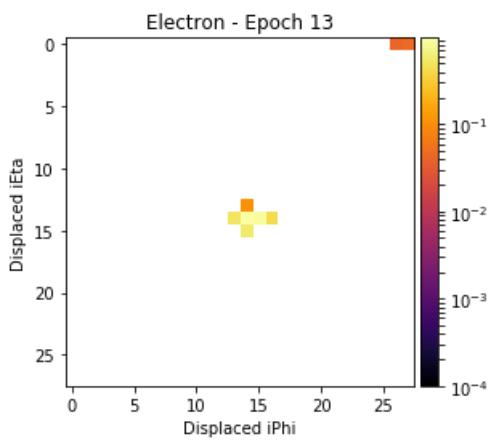
```

batch 125 g_loss : 3.381060
batch 126 d_loss : 0.039915
batch 126 g_loss : 3.514399
batch 127 d_loss : 0.036865
batch 127 g_loss : 3.467450
batch 128 d_loss : 0.044428
batch 128 g_loss : 3.441898
batch 129 d_loss : 0.036801
batch 129 g_loss : 3.404690
Epoch is 13
Number of batches 130
batch 0 d_loss : 0.027970
batch 0 g_loss : 3.440871

```

Layer (type)	Output Shape	Param #
dense_261 (Dense)	(None, 1024)	103424
activation_521 (Activation)	(None, 1024)	0
dense_262 (Dense)	(None, 6272)	6428800
batch_normalization_128 (Batch Normalization)	(None, 6272)	25088
activation_522 (Activation)	(None, 6272)	0
reshape_128 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_255 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_261 (Conv2D)	(None, 14, 14, 64)	204864
activation_523 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_256 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_262 (Conv2D)	(None, 28, 28, 1)	1601
activation_524 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.042320
batch 1 g_loss : 3.389364
batch 2 d_loss : 0.033274
batch 2 g_loss : 3.456152
batch 3 d_loss : 0.026493
batch 3 g_loss : 3.421530
batch 4 d_loss : 0.044644
batch 4 g_loss : 3.451120
batch 5 d_loss : 0.035231
batch 5 g_loss : 3.366657

```

batch 5 g\_loss : 3.500000  
batch 6 d\_loss : 0.046255  
batch 6 g\_loss : 3.580735  
batch 7 d\_loss : 0.045367  
batch 7 g\_loss : 3.504935  
batch 8 d\_loss : 0.042689  
batch 8 g\_loss : 3.422222  
batch 9 d\_loss : 0.037044  
batch 9 g\_loss : 3.406417  
batch 10 d\_loss : 0.048384  
batch 10 g\_loss : 3.501775  
batch 11 d\_loss : 0.041247  
batch 11 g\_loss : 3.537701  
batch 12 d\_loss : 0.045670  
batch 12 g\_loss : 3.420192  
batch 13 d\_loss : 0.034972  
batch 13 g\_loss : 3.405054  
batch 14 d\_loss : 0.040111  
batch 14 g\_loss : 3.411165  
batch 15 d\_loss : 0.045048  
batch 15 g\_loss : 3.533428  
batch 16 d\_loss : 0.040348  
batch 16 g\_loss : 3.410596  
batch 17 d\_loss : 0.031992  
batch 17 g\_loss : 3.493799  
batch 18 d\_loss : 0.041669  
batch 18 g\_loss : 3.550292  
batch 19 d\_loss : 0.035276  
batch 19 g\_loss : 3.503823  
batch 20 d\_loss : 0.033081  
batch 20 g\_loss : 3.499162  
batch 21 d\_loss : 0.039787  
batch 21 g\_loss : 3.446427  
batch 22 d\_loss : 0.038339  
batch 22 g\_loss : 3.457646  
batch 23 d\_loss : 0.033470  
batch 23 g\_loss : 3.471328  
batch 24 d\_loss : 0.032318  
batch 24 g\_loss : 3.487239  
batch 25 d\_loss : 0.045257  
batch 25 g\_loss : 3.397992  
batch 26 d\_loss : 0.032203  
batch 26 g\_loss : 3.455169  
batch 27 d\_loss : 0.032150  
batch 27 g\_loss : 3.417329  
batch 28 d\_loss : 0.038002  
batch 28 g\_loss : 3.473948  
batch 29 d\_loss : 0.040088  
batch 29 g\_loss : 3.463892  
batch 30 d\_loss : 0.029433  
batch 30 g\_loss : 3.476924  
batch 31 d\_loss : 0.034630  
batch 31 g\_loss : 3.583469  
batch 32 d\_loss : 0.030941  
batch 32 g\_loss : 3.436953  
batch 33 d\_loss : 0.028190  
batch 33 g\_loss : 3.673481  
batch 34 d\_loss : 0.040679  
batch 34 g\_loss : 3.346792  
batch 35 d\_loss : 0.035762  
batch 35 g\_loss : 3.409863  
batch 36 d\_loss : 0.031857  
batch 36 g\_loss : 3.411225  
batch 37 d\_loss : 0.030700  
batch 37 g\_loss : 3.569088  
batch 38 d\_loss : 0.035681  
batch 38 g\_loss : 3.493957  
batch 39 d\_loss : 0.030763  
batch 39 g\_loss : 3.479383  
batch 40 d\_loss : 0.039345  
batch 40 g\_loss : 3.483720  
batch 41 d\_loss : 0.033611  
batch 41 g\_loss : 3.530321

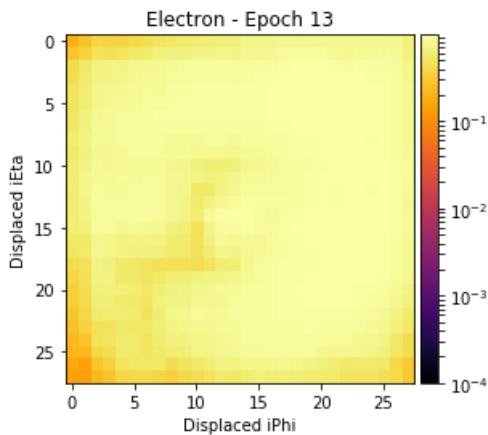
batch 41 g\_loss : 3.555521  
batch 42 d\_loss : 0.028825  
batch 42 g\_loss : 3.452736  
batch 43 d\_loss : 0.039982  
batch 43 g\_loss : 3.516247  
batch 44 d\_loss : 0.028962  
batch 44 g\_loss : 3.455921  
batch 45 d\_loss : 0.028946  
batch 45 g\_loss : 3.506246  
batch 46 d\_loss : 0.035686  
batch 46 g\_loss : 3.490270  
batch 47 d\_loss : 0.036005  
batch 47 g\_loss : 3.585142  
batch 48 d\_loss : 0.040588  
batch 48 g\_loss : 3.459961  
batch 49 d\_loss : 0.035475  
batch 49 g\_loss : 3.572120  
batch 50 d\_loss : 0.041769  
batch 50 g\_loss : 3.585149  
batch 51 d\_loss : 0.032942  
batch 51 g\_loss : 3.609546  
batch 52 d\_loss : 0.032864  
batch 52 g\_loss : 3.503384  
batch 53 d\_loss : 0.022391  
batch 53 g\_loss : 3.496721  
batch 54 d\_loss : 0.036879  
batch 54 g\_loss : 3.422722  
batch 55 d\_loss : 0.039445  
batch 55 g\_loss : 3.606418  
batch 56 d\_loss : 0.029298  
batch 56 g\_loss : 3.640531  
batch 57 d\_loss : 0.029214  
batch 57 g\_loss : 3.587569  
batch 58 d\_loss : 0.035270  
batch 58 g\_loss : 3.457154  
batch 59 d\_loss : 0.030429  
batch 59 g\_loss : 3.610381  
batch 60 d\_loss : 0.032748  
batch 60 g\_loss : 3.573482  
batch 61 d\_loss : 0.036469  
batch 61 g\_loss : 3.595321  
batch 62 d\_loss : 0.048046  
batch 62 g\_loss : 3.536986  
batch 63 d\_loss : 0.030020  
batch 63 g\_loss : 3.604901  
batch 64 d\_loss : 0.029572  
batch 64 g\_loss : 3.620316  
batch 65 d\_loss : 0.030920  
batch 65 g\_loss : 3.610849  
batch 66 d\_loss : 0.040490  
batch 66 g\_loss : 3.598797  
batch 67 d\_loss : 0.030212  
batch 67 g\_loss : 3.510144  
batch 68 d\_loss : 0.042413  
batch 68 g\_loss : 3.533124  
batch 69 d\_loss : 0.037307  
batch 69 g\_loss : 3.578616  
batch 70 d\_loss : 0.034748  
batch 70 g\_loss : 3.529036  
batch 71 d\_loss : 0.027907  
batch 71 g\_loss : 3.513985  
batch 72 d\_loss : 0.039562  
batch 72 g\_loss : 3.524392  
batch 73 d\_loss : 0.031994  
batch 73 g\_loss : 3.540793  
batch 74 d\_loss : 0.028789  
batch 74 g\_loss : 3.502097  
batch 75 d\_loss : 0.042610  
batch 75 g\_loss : 3.611397  
batch 76 d\_loss : 0.031354  
batch 76 g\_loss : 3.681000  
batch 77 d\_loss : 0.032022  
batch 77 g\_loss : 3.628691

batch 77 g\_loss : 3.595591  
batch 78 d\_loss : 0.037853  
batch 78 g\_loss : 3.596074  
batch 79 d\_loss : 0.029649  
batch 79 g\_loss : 3.585521  
batch 80 d\_loss : 0.034563  
batch 80 g\_loss : 3.654073  
batch 81 d\_loss : 0.037051  
batch 81 g\_loss : 3.583356  
batch 82 d\_loss : 0.034891  
batch 82 g\_loss : 3.524731  
batch 83 d\_loss : 0.027248  
batch 83 g\_loss : 3.569504  
batch 84 d\_loss : 0.029232  
batch 84 g\_loss : 3.594893  
batch 85 d\_loss : 0.038836  
batch 85 g\_loss : 3.581680  
batch 86 d\_loss : 0.027550  
batch 86 g\_loss : 3.636480  
batch 87 d\_loss : 0.031832  
batch 87 g\_loss : 3.593712  
batch 88 d\_loss : 0.028701  
batch 88 g\_loss : 3.548004  
batch 89 d\_loss : 0.025428  
batch 89 g\_loss : 3.547971  
batch 90 d\_loss : 0.029051  
batch 90 g\_loss : 3.655980  
batch 91 d\_loss : 0.029910  
batch 91 g\_loss : 3.740034  
batch 92 d\_loss : 0.036356  
batch 92 g\_loss : 3.511384  
batch 93 d\_loss : 0.027185  
batch 93 g\_loss : 3.527382  
batch 94 d\_loss : 0.034698  
batch 94 g\_loss : 3.604069  
batch 95 d\_loss : 0.026783  
batch 95 g\_loss : 3.625059  
batch 96 d\_loss : 0.032855  
batch 96 g\_loss : 3.621141  
batch 97 d\_loss : 0.029737  
batch 97 g\_loss : 3.623055  
batch 98 d\_loss : 0.025647  
batch 98 g\_loss : 3.770814  
batch 99 d\_loss : 0.031256  
batch 99 g\_loss : 3.540675  
batch 100 d\_loss : 0.026867  
batch 100 g\_loss : 3.680182

Layer (type)	Output Shape	Param #
dense_263 (Dense)	(None, 1024)	103424
activation_525 (Activation)	(None, 1024)	0
dense_264 (Dense)	(None, 6272)	6428800
batch_normalization_129 (Batch Normalization)	(None, 6272)	25088
activation_526 (Activation)	(None, 6272)	0
reshape_129 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_257 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_263 (Conv2D)	(None, 14, 14, 64)	204864
activation_527 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_258 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_264 (Conv2D)	(None, 28, 28, 1)	1601
activation_528 (Activation)	(None, 28, 28, 1)	0

```
=====  
=====
```

```
Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544
```



```
batch 101 d_loss : 0.033097  
batch 101 g_loss : 3.678402  
batch 102 d_loss : 0.027066  
batch 102 g_loss : 3.560842  
batch 103 d_loss : 0.029648  
batch 103 g_loss : 3.654616  
batch 104 d_loss : 0.028070  
batch 104 g_loss : 3.615179  
batch 105 d_loss : 0.030947  
batch 105 g_loss : 3.725085  
batch 106 d_loss : 0.026291  
batch 106 g_loss : 3.710282  
batch 107 d_loss : 0.026266  
batch 107 g_loss : 3.660421  
batch 108 d_loss : 0.026173  
batch 108 g_loss : 3.600719  
batch 109 d_loss : 0.030515  
batch 109 g_loss : 3.725202  
batch 110 d_loss : 0.026820  
batch 110 g_loss : 3.669830  
batch 111 d_loss : 0.027216  
batch 111 g_loss : 3.693833  
batch 112 d_loss : 0.027773  
batch 112 g_loss : 3.675117  
batch 113 d_loss : 0.030772  
batch 113 g_loss : 3.631287  
batch 114 d_loss : 0.028878  
batch 114 g_loss : 3.658505  
batch 115 d_loss : 0.024126  
batch 115 g_loss : 3.643917  
batch 116 d_loss : 0.028892  
batch 116 g_loss : 3.692319  
batch 117 d_loss : 0.023394  
batch 117 g_loss : 3.806999  
batch 118 d_loss : 0.027776  
batch 118 g_loss : 3.675564  
batch 119 d_loss : 0.031519  
batch 119 g_loss : 3.765356  
batch 120 d_loss : 0.025813  
batch 120 g_loss : 3.711969  
batch 121 d_loss : 0.027379  
batch 121 g_loss : 3.700687  
batch 122 d_loss : 0.026455  
batch 122 g_loss : 3.701009  
batch 123 d_loss : 0.028422  
batch 123 g_loss : 3.681983  
batch 124 d_loss : 0.025187  
batch 124 g_loss : 3.868230
```

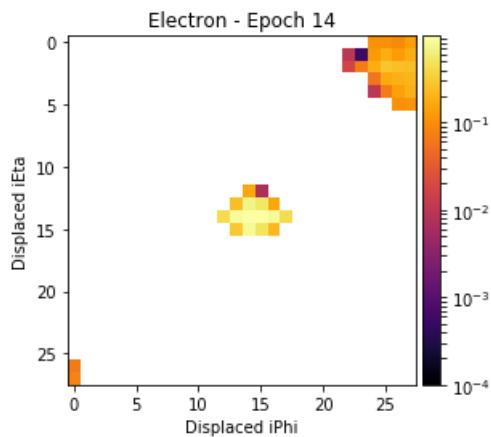
```

batch 125 d_loss : 0.029292
batch 125 g_loss : 3.871655
batch 126 d_loss : 0.029061
batch 126 g_loss : 3.682530
batch 127 d_loss : 0.027255
batch 127 g_loss : 3.670138
batch 128 d_loss : 0.031924
batch 128 g_loss : 3.754158
batch 129 d_loss : 0.026733
batch 129 g_loss : 3.778271
Epoch is 14
Number of batches 130
batch 0 d_loss : 0.019996
batch 0 g_loss : 3.756691

```

Layer (type)	Output Shape	Param #
dense_265 (Dense)	(None, 1024)	103424
activation_529 (Activation)	(None, 1024)	0
dense_266 (Dense)	(None, 6272)	6428800
batch_normalization_130 (Batch Normalization)	(None, 6272)	25088
activation_530 (Activation)	(None, 6272)	0
reshape_130 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_259 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_265 (Conv2D)	(None, 14, 14, 64)	204864
activation_531 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_260 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_266 (Conv2D)	(None, 28, 28, 1)	1601
activation_532 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.030532
batch 1 g_loss : 3.636945
batch 2 d_loss : 0.023929
batch 2 g_loss : 3.647628
batch 3 d_loss : 0.019809
batch 3 g_loss : 3.738262
batch 4 d_loss : 0.032237
batch 4 g_loss : 3.757801

```

batch 5 g\_loss : 3.701740  
batch 6 d\_loss : 0.033334  
batch 6 g\_loss : 3.742906  
batch 7 d\_loss : 0.031557  
batch 7 g\_loss : 3.753899  
batch 8 d\_loss : 0.030021  
batch 8 g\_loss : 3.788470  
batch 9 d\_loss : 0.026274  
batch 9 g\_loss : 3.768836  
batch 10 d\_loss : 0.033804  
batch 10 g\_loss : 3.862875  
batch 11 d\_loss : 0.029114  
batch 11 g\_loss : 3.785125  
batch 12 d\_loss : 0.032019  
batch 12 g\_loss : 3.728081  
batch 13 d\_loss : 0.025743  
batch 13 g\_loss : 3.756397  
batch 14 d\_loss : 0.028893  
batch 14 g\_loss : 3.790556  
batch 15 d\_loss : 0.032743  
batch 15 g\_loss : 3.815561  
batch 16 d\_loss : 0.028970  
batch 16 g\_loss : 3.715493  
batch 17 d\_loss : 0.023185  
batch 17 g\_loss : 3.746795  
batch 18 d\_loss : 0.029212  
batch 18 g\_loss : 3.799046  
batch 19 d\_loss : 0.025159  
batch 19 g\_loss : 3.682343  
batch 20 d\_loss : 0.024064  
batch 20 g\_loss : 3.814331  
batch 21 d\_loss : 0.027914  
batch 21 g\_loss : 3.789709  
batch 22 d\_loss : 0.027552  
batch 22 g\_loss : 3.725417  
batch 23 d\_loss : 0.024463  
batch 23 g\_loss : 3.786707  
batch 24 d\_loss : 0.022892  
batch 24 g\_loss : 3.784821  
batch 25 d\_loss : 0.032055  
batch 25 g\_loss : 3.760102  
batch 26 d\_loss : 0.023216  
batch 26 g\_loss : 3.763442  
batch 27 d\_loss : 0.023333  
batch 27 g\_loss : 3.862723  
batch 28 d\_loss : 0.027463  
batch 28 g\_loss : 3.766570  
batch 29 d\_loss : 0.028965  
batch 29 g\_loss : 3.737122  
batch 30 d\_loss : 0.020885  
batch 30 g\_loss : 3.803830  
batch 31 d\_loss : 0.025131  
batch 31 g\_loss : 3.738806  
batch 32 d\_loss : 0.022336  
batch 32 g\_loss : 3.783112  
batch 33 d\_loss : 0.021108  
batch 33 g\_loss : 3.879812  
batch 34 d\_loss : 0.029200  
batch 34 g\_loss : 3.835015  
batch 35 d\_loss : 0.025160  
batch 35 g\_loss : 3.858247  
batch 36 d\_loss : 0.023215  
batch 36 g\_loss : 3.765806  
batch 37 d\_loss : 0.022475  
batch 37 g\_loss : 3.813152  
batch 38 d\_loss : 0.024997  
batch 38 g\_loss : 3.813058  
batch 39 d\_loss : 0.022669  
batch 39 g\_loss : 3.922936  
batch 40 d\_loss : 0.027516  
batch 40 g\_loss : 3.778611

batch 41 d\_loss : 0.021115

```
batch 41 a_loss : 0.024110
batch 41 g_loss : 3.778483
batch 42 d_loss : 0.020350
batch 42 g_loss : 3.912529
batch 43 d_loss : 0.029219
batch 43 g_loss : 3.887313
batch 44 d_loss : 0.021694
batch 44 g_loss : 3.737550
batch 45 d_loss : 0.020448
batch 45 g_loss : 3.837685
batch 46 d_loss : 0.025886
batch 46 g_loss : 3.922954
batch 47 d_loss : 0.025846
batch 47 g_loss : 3.900326
batch 48 d_loss : 0.029233
batch 48 g_loss : 3.907160
batch 49 d_loss : 0.025504
batch 49 g_loss : 3.897389
batch 50 d_loss : 0.030000
batch 50 g_loss : 3.809305
batch 51 d_loss : 0.023906
batch 51 g_loss : 3.756885
batch 52 d_loss : 0.024260
batch 52 g_loss : 3.763479
batch 53 d_loss : 0.016494
batch 53 g_loss : 3.836323
batch 54 d_loss : 0.025667
batch 54 g_loss : 3.888092
batch 55 d_loss : 0.027429
batch 55 g_loss : 3.862270
batch 56 d_loss : 0.021343
batch 56 g_loss : 3.897019
batch 57 d_loss : 0.021046
batch 57 g_loss : 3.836170
batch 58 d_loss : 0.025057
batch 58 g_loss : 3.855424
batch 59 d_loss : 0.022243
batch 59 g_loss : 3.921484
batch 60 d_loss : 0.023449
batch 60 g_loss : 3.852052
batch 61 d_loss : 0.026260
batch 61 g_loss : 3.924000
batch 62 d_loss : 0.033475
batch 62 g_loss : 3.990299
batch 63 d_loss : 0.021664
batch 63 g_loss : 3.889501
batch 64 d_loss : 0.022069
batch 64 g_loss : 3.879272
batch 65 d_loss : 0.022794
batch 65 g_loss : 3.841383
batch 66 d_loss : 0.028652
batch 66 g_loss : 3.864702
batch 67 d_loss : 0.021485
batch 67 g_loss : 3.883141
batch 68 d_loss : 0.030726
batch 68 g_loss : 3.913375
batch 69 d_loss : 0.026982
batch 69 g_loss : 3.944174
batch 70 d_loss : 0.024546
batch 70 g_loss : 3.900987
batch 71 d_loss : 0.020500
batch 71 g_loss : 3.978640
batch 72 d_loss : 0.028570
batch 72 g_loss : 3.921106
batch 73 d_loss : 0.022989
batch 73 g_loss : 3.853073
batch 74 d_loss : 0.020564
batch 74 g_loss : 4.005279
batch 75 d_loss : 0.030690
batch 75 g_loss : 3.921944
batch 76 d_loss : 0.022377
batch 76 g_loss : 3.945319
batch 77 d_loss : 0.022027
```

batch 76 g\_loss : 3.958812  
 batch 77 g\_loss : 3.958812  
 batch 78 d\_loss : 0.026495  
 batch 78 g\_loss : 3.883797  
 batch 79 d\_loss : 0.021765  
 batch 79 g\_loss : 3.971002  
 batch 80 d\_loss : 0.024811  
 batch 80 g\_loss : 3.871020  
 batch 81 d\_loss : 0.026039  
 batch 81 g\_loss : 3.844131  
 batch 82 d\_loss : 0.025195  
 batch 82 g\_loss : 3.914141  
 batch 83 d\_loss : 0.019443  
 batch 83 g\_loss : 3.920332  
 batch 84 d\_loss : 0.020594  
 batch 84 g\_loss : 4.052579  
 batch 85 d\_loss : 0.027351  
 batch 85 g\_loss : 3.942574  
 batch 86 d\_loss : 0.020324  
 batch 86 g\_loss : 4.063517  
 batch 87 d\_loss : 0.023050  
 batch 87 g\_loss : 3.910214  
 batch 88 d\_loss : 0.021176  
 batch 88 g\_loss : 3.922769  
 batch 89 d\_loss : 0.018468  
 batch 89 g\_loss : 3.905223  
 batch 90 d\_loss : 0.021151  
 batch 90 g\_loss : 3.931927  
 batch 91 d\_loss : 0.022066  
 batch 91 g\_loss : 3.898804  
 batch 92 d\_loss : 0.027018  
 batch 92 g\_loss : 3.980740  
 batch 93 d\_loss : 0.020118  
 batch 93 g\_loss : 4.043038  
 batch 94 d\_loss : 0.025667  
 batch 94 g\_loss : 3.911491  
 batch 95 d\_loss : 0.020572  
 batch 95 g\_loss : 3.962832  
 batch 96 d\_loss : 0.024130  
 batch 96 g\_loss : 3.926751  
 batch 97 d\_loss : 0.020832  
 batch 97 g\_loss : 3.987097  
 batch 98 d\_loss : 0.018550  
 batch 98 g\_loss : 3.966715  
 batch 99 d\_loss : 0.022972  
 batch 99 g\_loss : 3.918612  
 batch 100 d\_loss : 0.019205  
 batch 100 g\_loss : 3.885275

Layer (type)	Output Shape	Param #
dense_267 (Dense)	(None, 1024)	103424
activation_533 (Activation)	(None, 1024)	0
dense_268 (Dense)	(None, 6272)	6428800
batch_normalization_131 (Batch Normalization)	(None, 6272)	25088
activation_534 (Activation)	(None, 6272)	0
reshape_131 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_261 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_267 (Conv2D)	(None, 14, 14, 64)	204864
activation_535 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_262 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_268 (Conv2D)	(None, 28, 28, 1)	1601

```
activation_536 (Activation) (None, 28, 28, 1) 0
```

---

```
Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544
```

---

```
batch 101 d_loss : 0.024287  
batch 101 g_loss : 4.038631  
batch 102 d_loss : 0.020617  
batch 102 g_loss : 3.990926  
batch 103 d_loss : 0.021869  
batch 103 g_loss : 4.054612  
batch 104 d_loss : 0.021572  
batch 104 g_loss : 3.998608  
batch 105 d_loss : 0.022559  
batch 105 g_loss : 4.009125  
batch 106 d_loss : 0.019762  
batch 106 g_loss : 3.970341  
batch 107 d_loss : 0.019536  
batch 107 g_loss : 3.906518  
batch 108 d_loss : 0.019946  
batch 108 g_loss : 4.006668  
batch 109 d_loss : 0.022531  
batch 109 g_loss : 3.921845  
batch 110 d_loss : 0.019482  
batch 110 g_loss : 4.013408  
batch 111 d_loss : 0.020534  
batch 111 g_loss : 3.890764  
batch 112 d_loss : 0.020306  
batch 112 g_loss : 4.028913  
batch 113 d_loss : 0.022609  
batch 113 g_loss : 4.125274  
batch 114 d_loss : 0.020940  
batch 114 g_loss : 4.017241  
batch 115 d_loss : 0.017724  
batch 115 g_loss : 3.999146  
batch 116 d_loss : 0.021443  
batch 116 g_loss : 4.038833  
batch 117 d_loss : 0.017360  
batch 117 g_loss : 3.992841  
batch 118 d_loss : 0.020465  
batch 118 g_loss : 4.119084  
batch 119 d_loss : 0.022375  
batch 119 g_loss : 4.118825  
batch 120 d_loss : 0.019602  
batch 120 g_loss : 4.043855  
batch 121 d_loss : 0.020899  
batch 121 g_loss : 3.960838  
batch 122 d_loss : 0.019458  
batch 122 g_loss : 4.057773  
batch 123 d_loss : 0.021095  
batch 123 g_loss : 4.081182  
batch 124 d_loss : 0.018158
```

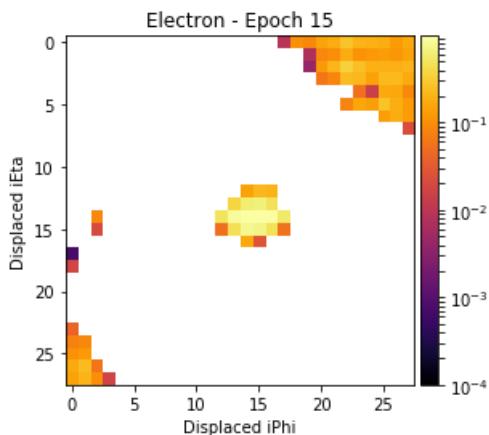
```

batch 124 g_loss : 4.135747
batch 125 d_loss : 0.021578
batch 125 g_loss : 4.027655
batch 126 d_loss : 0.021569
batch 126 g_loss : 4.021023
batch 127 d_loss : 0.019963
batch 127 g_loss : 4.112630
batch 128 d_loss : 0.022445
batch 128 g_loss : 4.096173
batch 129 d_loss : 0.019545
batch 129 g_loss : 4.011041
Epoch is 15
Number of batches 130
batch 0 d_loss : 0.015009
batch 0 g_loss : 4.096279

```

Layer (type)	Output Shape	Param #
dense_269 (Dense)	(None, 1024)	103424
activation_537 (Activation)	(None, 1024)	0
dense_270 (Dense)	(None, 6272)	6428800
batch_normalization_132 (Batch Normalization)	(None, 6272)	25088
activation_538 (Activation)	(None, 6272)	0
reshape_132 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_263 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_269 (Conv2D)	(None, 14, 14, 64)	204864
activation_539 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_264 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_270 (Conv2D)	(None, 28, 28, 1)	1601
activation_540 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.021629
batch 1 g_loss : 4.048453
batch 2 d_loss : 0.018281
batch 2 g_loss : 4.132994
batch 3 d_loss : 0.014539
batch 3 g_loss : 4.084816
batch 4 d_loss : 0.023167
batch 4 g_loss : 4.011041

```

batch 4 g\_loss : 4.107081  
batch 5 d\_loss : 0.018415  
batch 5 g\_loss : 4.212784  
batch 6 d\_loss : 0.024468  
batch 6 g\_loss : 4.059489  
batch 7 d\_loss : 0.023115  
batch 7 g\_loss : 4.124739  
batch 8 d\_loss : 0.022572  
batch 8 g\_loss : 4.091294  
batch 9 d\_loss : 0.019581  
batch 9 g\_loss : 4.045562  
batch 10 d\_loss : 0.024949  
batch 10 g\_loss : 4.084573  
batch 11 d\_loss : 0.021576  
batch 11 g\_loss : 4.090895  
batch 12 d\_loss : 0.023780  
batch 12 g\_loss : 4.164692  
batch 13 d\_loss : 0.019055  
batch 13 g\_loss : 4.149313  
batch 14 d\_loss : 0.020955  
batch 14 g\_loss : 4.182719  
batch 15 d\_loss : 0.024018  
batch 15 g\_loss : 4.074898  
batch 16 d\_loss : 0.020760  
batch 16 g\_loss : 4.061001  
batch 17 d\_loss : 0.016878  
batch 17 g\_loss : 4.035790  
batch 18 d\_loss : 0.021420  
batch 18 g\_loss : 4.055168  
batch 19 d\_loss : 0.018532  
batch 19 g\_loss : 4.136603  
batch 20 d\_loss : 0.018391  
batch 20 g\_loss : 4.081484  
batch 21 d\_loss : 0.020859  
batch 21 g\_loss : 4.196728  
batch 22 d\_loss : 0.019874  
batch 22 g\_loss : 4.128154  
batch 23 d\_loss : 0.017784  
batch 23 g\_loss : 4.091867  
batch 24 d\_loss : 0.017389  
batch 24 g\_loss : 4.145277  
batch 25 d\_loss : 0.023501  
batch 25 g\_loss : 4.073751  
batch 26 d\_loss : 0.017755  
batch 26 g\_loss : 4.111721  
batch 27 d\_loss : 0.017631  
batch 27 g\_loss : 4.058378  
batch 28 d\_loss : 0.019992  
batch 28 g\_loss : 4.170491  
batch 29 d\_loss : 0.021854  
batch 29 g\_loss : 4.084789  
batch 30 d\_loss : 0.016299  
batch 30 g\_loss : 4.135441  
batch 31 d\_loss : 0.018219  
batch 31 g\_loss : 4.104344  
batch 32 d\_loss : 0.016684  
batch 32 g\_loss : 4.125145  
batch 33 d\_loss : 0.016217  
batch 33 g\_loss : 4.167147  
batch 34 d\_loss : 0.021529  
batch 34 g\_loss : 4.156905  
batch 35 d\_loss : 0.018638  
batch 35 g\_loss : 4.214471  
batch 36 d\_loss : 0.017198  
batch 36 g\_loss : 4.146367  
batch 37 d\_loss : 0.017387  
batch 37 g\_loss : 4.127826  
batch 38 d\_loss : 0.019169  
batch 38 g\_loss : 4.192582  
batch 39 d\_loss : 0.016395  
batch 39 g\_loss : 4.089915  
batch 40 d\_loss : 0.021061

batch 40 g\_loss : 4.253604  
batch 41 d\_loss : 0.018662  
batch 41 g\_loss : 4.208758  
batch 42 d\_loss : 0.015363  
batch 42 g\_loss : 4.107563  
batch 43 d\_loss : 0.021203  
batch 43 g\_loss : 4.203132  
batch 44 d\_loss : 0.016330  
batch 44 g\_loss : 4.285540  
batch 45 d\_loss : 0.015677  
batch 45 g\_loss : 4.165276  
batch 46 d\_loss : 0.019583  
batch 46 g\_loss : 4.189418  
batch 47 d\_loss : 0.019290  
batch 47 g\_loss : 4.118768  
batch 48 d\_loss : 0.021189  
batch 48 g\_loss : 4.235175  
batch 49 d\_loss : 0.019341  
batch 49 g\_loss : 4.237180  
batch 50 d\_loss : 0.022453  
batch 50 g\_loss : 4.226496  
batch 51 d\_loss : 0.017581  
batch 51 g\_loss : 4.259360  
batch 52 d\_loss : 0.018363  
batch 52 g\_loss : 4.201635  
batch 53 d\_loss : 0.012688  
batch 53 g\_loss : 4.247894  
batch 54 d\_loss : 0.019334  
batch 54 g\_loss : 4.101277  
batch 55 d\_loss : 0.020941  
batch 55 g\_loss : 4.162333  
batch 56 d\_loss : 0.015729  
batch 56 g\_loss : 4.135545  
batch 57 d\_loss : 0.015927  
batch 57 g\_loss : 4.269955  
batch 58 d\_loss : 0.019219  
batch 58 g\_loss : 4.235561  
batch 59 d\_loss : 0.017405  
batch 59 g\_loss : 4.200038  
batch 60 d\_loss : 0.018709  
batch 60 g\_loss : 4.198614  
batch 61 d\_loss : 0.020031  
batch 61 g\_loss : 4.264191  
batch 62 d\_loss : 0.025582  
batch 62 g\_loss : 4.177807  
batch 63 d\_loss : 0.015793  
batch 63 g\_loss : 4.185386  
batch 64 d\_loss : 0.015995  
batch 64 g\_loss : 4.164021  
batch 65 d\_loss : 0.016995  
batch 65 g\_loss : 4.287086  
batch 66 d\_loss : 0.022237  
batch 66 g\_loss : 4.201921  
batch 67 d\_loss : 0.017096  
batch 67 g\_loss : 4.307150  
batch 68 d\_loss : 0.022964  
batch 68 g\_loss : 4.195819  
batch 69 d\_loss : 0.020074  
batch 69 g\_loss : 4.148809  
batch 70 d\_loss : 0.018046  
batch 70 g\_loss : 4.171320  
batch 71 d\_loss : 0.014945  
batch 71 g\_loss : 4.197987  
batch 72 d\_loss : 0.020359  
batch 72 g\_loss : 4.271133  
batch 73 d\_loss : 0.016755  
batch 73 g\_loss : 4.218742  
batch 74 d\_loss : 0.015815  
batch 74 g\_loss : 4.208600  
batch 75 d\_loss : 0.022644  
batch 75 g\_loss : 4.210157  
batch 76 d\_loss : 0.017847

```

batch 76 g_loss : 4.104901
batch 77 d_loss : 0.017538
batch 77 g_loss : 4.347261
batch 78 d_loss : 0.020288
batch 78 g_loss : 4.253007
batch 79 d_loss : 0.016275
batch 79 g_loss : 4.179166
batch 80 d_loss : 0.018871
batch 80 g_loss : 4.244136
batch 81 d_loss : 0.020334
batch 81 g_loss : 4.344721
batch 82 d_loss : 0.018680
batch 82 g_loss : 4.251124
batch 83 d_loss : 0.014698
batch 83 g_loss : 4.208829
batch 84 d_loss : 0.015239
batch 84 g_loss : 4.242513
batch 85 d_loss : 0.021552
batch 85 g_loss : 4.242745
batch 86 d_loss : 0.015982
batch 86 g_loss : 4.204964
batch 87 d_loss : 0.017775
batch 87 g_loss : 4.239498
batch 88 d_loss : 0.015232
batch 88 g_loss : 4.260061
batch 89 d_loss : 0.014599
batch 89 g_loss : 4.279474
batch 90 d_loss : 0.016079
batch 90 g_loss : 4.249475
batch 91 d_loss : 0.016724
batch 91 g_loss : 4.290492
batch 92 d_loss : 0.020654
batch 92 g_loss : 4.279035
batch 93 d_loss : 0.014743
batch 93 g_loss : 4.213570
batch 94 d_loss : 0.019177
batch 94 g_loss : 4.267901
batch 95 d_loss : 0.014781
batch 95 g_loss : 4.287495
batch 96 d_loss : 0.018520
batch 96 g_loss : 4.244278
batch 97 d_loss : 0.016036
batch 97 g_loss : 4.267604
batch 98 d_loss : 0.014579
batch 98 g_loss : 4.302469
batch 99 d_loss : 0.017331
batch 99 g_loss : 4.307515
batch 100 d_loss : 0.014655
batch 100 g_loss : 4.298828

```

Layer (type)	Output Shape	Param #
dense_271 (Dense)	(None, 1024)	103424
activation_541 (Activation)	(None, 1024)	0
dense_272 (Dense)	(None, 6272)	6428800
batch_normalization_133 (Batch Normalization)	(None, 6272)	25088
activation_542 (Activation)	(None, 6272)	0
reshape_133 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_265 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_271 (Conv2D)	(None, 14, 14, 64)	204864
activation_543 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_266 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_272 (Conv2D)	(None, 28, 28, 1)	1601

CONV2D\_2/2 (CONV2D)

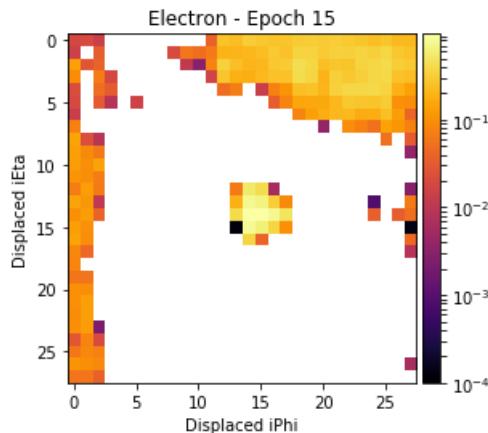
(None, 20, 20, 1)

TOU1

activation\_544 (Activation) (None, 28, 28, 1)

0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



batch 101 d\_loss : 0.018763  
batch 101 g\_loss : 4.217826  
batch 102 d\_loss : 0.015633  
batch 102 g\_loss : 4.424042  
batch 103 d\_loss : 0.016360  
batch 103 g\_loss : 4.251026  
batch 104 d\_loss : 0.015939  
batch 104 g\_loss : 4.248360  
batch 105 d\_loss : 0.016870  
batch 105 g\_loss : 4.269954  
batch 106 d\_loss : 0.014337  
batch 106 g\_loss : 4.325469  
batch 107 d\_loss : 0.015299  
batch 107 g\_loss : 4.275956  
batch 108 d\_loss : 0.016128  
batch 108 g\_loss : 4.241498  
batch 109 d\_loss : 0.017409  
batch 109 g\_loss : 4.318218  
batch 110 d\_loss : 0.015560  
batch 110 g\_loss : 4.291937  
batch 111 d\_loss : 0.015447  
batch 111 g\_loss : 4.494460  
batch 112 d\_loss : 0.015259  
batch 112 g\_loss : 4.383291  
batch 113 d\_loss : 0.016914  
batch 113 g\_loss : 4.278093  
batch 114 d\_loss : 0.016178  
batch 114 g\_loss : 4.278088  
batch 115 d\_loss : 0.013837  
batch 115 g\_loss : 4.262702  
batch 116 d\_loss : 0.016349  
batch 116 g\_loss : 4.351729  
batch 117 d\_loss : 0.012856  
batch 117 g\_loss : 4.364600  
batch 118 d\_loss : 0.016116  
batch 118 g\_loss : 4.332941  
batch 119 d\_loss : 0.017426  
batch 119 g\_loss : 4.381904  
batch 120 d\_loss : 0.014692  
batch 120 g\_loss : 4.396845  
batch 121 d\_loss : 0.015628  
batch 121 g\_loss : 4.376647  
batch 122 d\_loss : 0.015252  
batch 122 g\_loss : 4.363848  
batch 123 d\_loss : 0.016144  
batch 123 g\_loss : 4.332793

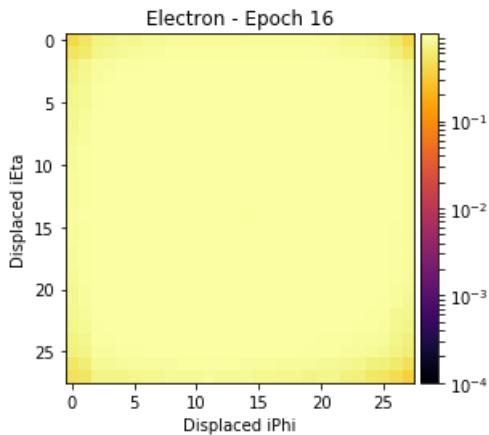
```

batch 124 d_loss : 0.013903
batch 124 g_loss : 4.371546
batch 125 d_loss : 0.016968
batch 125 g_loss : 4.518257
batch 126 d_loss : 0.017592
batch 126 g_loss : 4.367966
batch 127 d_loss : 0.014764
batch 127 g_loss : 4.362531
batch 128 d_loss : 0.018444
batch 128 g_loss : 4.443709
batch 129 d_loss : 0.014465
batch 129 g_loss : 4.373852
Epoch is 16
Number of batches 130
batch 0 d_loss : 0.012340
batch 0 g_loss : 4.402299

```

Layer (type)	Output Shape	Param #
dense_273 (Dense)	(None, 1024)	103424
activation_545 (Activation)	(None, 1024)	0
dense_274 (Dense)	(None, 6272)	6428800
batch_normalization_134 (Batch Normalization)	(None, 6272)	25088
activation_546 (Activation)	(None, 6272)	0
reshape_134 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_267 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_273 (Conv2D)	(None, 14, 14, 64)	204864
activation_547 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_268 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_274 (Conv2D)	(None, 28, 28, 1)	1601
activation_548 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.016678
batch 1 g_loss : 4.482967
batch 2 d_loss : 0.014417
batch 2 g_loss : 4.418356
batch 3 d_loss : 0.012097
batch 3 g_loss : 4.358253

```

batch 4 d\_loss : 0.018115  
batch 4 g\_loss : 4.421574  
batch 5 d\_loss : 0.014128  
batch 5 g\_loss : 4.412959  
batch 6 d\_loss : 0.019281  
batch 6 g\_loss : 4.359784  
batch 7 d\_loss : 0.018097  
batch 7 g\_loss : 4.418632  
batch 8 d\_loss : 0.016913  
batch 8 g\_loss : 4.426653  
batch 9 d\_loss : 0.014846  
batch 9 g\_loss : 4.352566  
batch 10 d\_loss : 0.019444  
batch 10 g\_loss : 4.407198  
batch 11 d\_loss : 0.016072  
batch 11 g\_loss : 4.458608  
batch 12 d\_loss : 0.017599  
batch 12 g\_loss : 4.458019  
batch 13 d\_loss : 0.014893  
batch 13 g\_loss : 4.421958  
batch 14 d\_loss : 0.016666  
batch 14 g\_loss : 4.434102  
batch 15 d\_loss : 0.018689  
batch 15 g\_loss : 4.474757  
batch 16 d\_loss : 0.016367  
batch 16 g\_loss : 4.442155  
batch 17 d\_loss : 0.012040  
batch 17 g\_loss : 4.344579  
batch 18 d\_loss : 0.016429  
batch 18 g\_loss : 4.372406  
batch 19 d\_loss : 0.014519  
batch 19 g\_loss : 4.376536  
batch 20 d\_loss : 0.014401  
batch 20 g\_loss : 4.354596  
batch 21 d\_loss : 0.016856  
batch 21 g\_loss : 4.371004  
batch 22 d\_loss : 0.016272  
batch 22 g\_loss : 4.379028  
batch 23 d\_loss : 0.015398  
batch 23 g\_loss : 4.346084  
batch 24 d\_loss : 0.012918  
batch 24 g\_loss : 4.460472  
batch 25 d\_loss : 0.018491  
batch 25 g\_loss : 4.462163  
batch 26 d\_loss : 0.013395  
batch 26 g\_loss : 4.472150  
batch 27 d\_loss : 0.013541  
batch 27 g\_loss : 4.419727  
batch 28 d\_loss : 0.015097  
batch 28 g\_loss : 4.441143  
batch 29 d\_loss : 0.016935  
batch 29 g\_loss : 4.381889  
batch 30 d\_loss : 0.011899  
batch 30 g\_loss : 4.445370  
batch 31 d\_loss : 0.014513  
batch 31 g\_loss : 4.436561  
batch 32 d\_loss : 0.012905  
batch 32 g\_loss : 4.446680  
batch 33 d\_loss : 0.012438  
batch 33 g\_loss : 4.499950  
batch 34 d\_loss : 0.016709  
batch 34 g\_loss : 4.405752  
batch 35 d\_loss : 0.013949  
batch 35 g\_loss : 4.465568  
batch 36 d\_loss : 0.012869  
batch 36 g\_loss : 4.678424  
batch 37 d\_loss : 0.013907  
batch 37 g\_loss : 4.526125  
batch 38 d\_loss : 0.014516  
batch 38 g\_loss : 4.462372  
batch 39 d\_loss : 0.014338  
batch 39 g\_loss : 4.407527  
.....

batch 40 d\_loss : 0.016617  
batch 40 g\_loss : 4.489049  
batch 41 d\_loss : 0.014557  
batch 41 g\_loss : 4.485012  
batch 42 d\_loss : 0.012330  
batch 42 g\_loss : 4.571102  
batch 43 d\_loss : 0.017034  
batch 43 g\_loss : 4.621799  
batch 44 d\_loss : 0.012153  
batch 44 g\_loss : 4.461109  
batch 45 d\_loss : 0.013515  
batch 45 g\_loss : 4.617617  
batch 46 d\_loss : 0.015104  
batch 46 g\_loss : 4.522171  
batch 47 d\_loss : 0.015066  
batch 47 g\_loss : 4.620503  
batch 48 d\_loss : 0.016589  
batch 48 g\_loss : 4.495011  
batch 49 d\_loss : 0.014719  
batch 49 g\_loss : 4.463956  
batch 50 d\_loss : 0.017004  
batch 50 g\_loss : 4.563670  
batch 51 d\_loss : 0.013508  
batch 51 g\_loss : 4.497289  
batch 52 d\_loss : 0.014116  
batch 52 g\_loss : 4.473040  
batch 53 d\_loss : 0.010185  
batch 53 g\_loss : 4.470499  
batch 54 d\_loss : 0.015667  
batch 54 g\_loss : 4.507400  
batch 55 d\_loss : 0.017001  
batch 55 g\_loss : 4.477159  
batch 56 d\_loss : 0.013212  
batch 56 g\_loss : 4.459048  
batch 57 d\_loss : 0.012720  
batch 57 g\_loss : 4.592520  
batch 58 d\_loss : 0.016101  
batch 58 g\_loss : 4.516014  
batch 59 d\_loss : 0.013449  
batch 59 g\_loss : 4.581229  
batch 60 d\_loss : 0.014504  
batch 60 g\_loss : 4.543856  
batch 61 d\_loss : 0.016267  
batch 61 g\_loss : 4.581823  
batch 62 d\_loss : 0.019143  
batch 62 g\_loss : 4.581150  
batch 63 d\_loss : 0.013087  
batch 63 g\_loss : 4.566471  
batch 64 d\_loss : 0.013358  
batch 64 g\_loss : 4.514587  
batch 65 d\_loss : 0.013989  
batch 65 g\_loss : 4.514079  
batch 66 d\_loss : 0.016806  
batch 66 g\_loss : 4.703281  
batch 67 d\_loss : 0.012931  
batch 67 g\_loss : 4.520059  
batch 68 d\_loss : 0.018893  
batch 68 g\_loss : 4.579721  
batch 69 d\_loss : 0.015400  
batch 69 g\_loss : 4.541605  
batch 70 d\_loss : 0.014233  
batch 70 g\_loss : 4.529862  
batch 71 d\_loss : 0.012113  
batch 71 g\_loss : 4.696856  
batch 72 d\_loss : 0.016447  
batch 72 g\_loss : 4.527533  
batch 73 d\_loss : 0.013872  
batch 73 g\_loss : 4.661386  
batch 74 d\_loss : 0.012933  
batch 74 g\_loss : 4.660622  
batch 75 d\_loss : 0.018683  
batch 75 g\_loss : 4.581028  
. . . . .

```

batch 76 d_loss : 0.014280
batch 76 g_loss : 4.617814
batch 77 d_loss : 0.013638
batch 77 g_loss : 4.631025
batch 78 d_loss : 0.015039
batch 78 g_loss : 4.464874
batch 79 d_loss : 0.013730
batch 79 g_loss : 4.593112
batch 80 d_loss : 0.016006
batch 80 g_loss : 4.556561
batch 81 d_loss : 0.016288
batch 81 g_loss : 4.493443
batch 82 d_loss : 0.015260
batch 82 g_loss : 4.612486
batch 83 d_loss : 0.012600
batch 83 g_loss : 4.563698
batch 84 d_loss : 0.012590
batch 84 g_loss : 4.630011
batch 85 d_loss : 0.016913
batch 85 g_loss : 4.614582
batch 86 d_loss : 0.012709
batch 86 g_loss : 4.679581
batch 87 d_loss : 0.015172
batch 87 g_loss : 4.621465
batch 88 d_loss : 0.013262
batch 88 g_loss : 4.591787
batch 89 d_loss : 0.011501
batch 89 g_loss : 4.618987
batch 90 d_loss : 0.013962
batch 90 g_loss : 4.610691
batch 91 d_loss : 0.012758
batch 91 g_loss : 4.602579
batch 92 d_loss : 0.015562
batch 92 g_loss : 4.627744
batch 93 d_loss : 0.012872
batch 93 g_loss : 4.555312
batch 94 d_loss : 0.015320
batch 94 g_loss : 4.668466
batch 95 d_loss : 0.012119
batch 95 g_loss : 4.592649
batch 96 d_loss : 0.014781
batch 96 g_loss : 4.598556
batch 97 d_loss : 0.012325
batch 97 g_loss : 4.578280
batch 98 d_loss : 0.012057
batch 98 g_loss : 4.634412
batch 99 d_loss : 0.013965
batch 99 g_loss : 4.592395
batch 100 d_loss : 0.011215
batch 100 g_loss : 4.601657

```

Layer (type)	Output Shape	Param #
dense_275 (Dense)	(None, 1024)	103424
activation_549 (Activation)	(None, 1024)	0
dense_276 (Dense)	(None, 6272)	6428800
batch_normalization_135 (Batch Normalization)	(None, 6272)	25088
activation_550 (Activation)	(None, 6272)	0
reshape_135 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_269 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_275 (Conv2D)	(None, 14, 14, 64)	204864
activation_551 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_270 (UpSampling2D)	(None, 28, 28, 64)	0

conv2d_276 (Conv2D)	(None, 28, 28, 1)	1601
activation_552 (Activation)	(None, 28, 28, 1)	0
<hr/>		
Total params: 6,763,777		
Trainable params: 6,751,233		
Non-trainable params: 12,544		

---

batch 101 d\_loss : 0.015608  
 batch 101 g\_loss : 4.573147  
 batch 102 d\_loss : 0.013309  
 batch 102 g\_loss : 4.631262  
 batch 103 d\_loss : 0.012471  
 batch 103 g\_loss : 4.612677  
 batch 104 d\_loss : 0.012639  
 batch 104 g\_loss : 4.668748  
 batch 105 d\_loss : 0.013902  
 batch 105 g\_loss : 4.673162  
 batch 106 d\_loss : 0.012771  
 batch 106 g\_loss : 4.618228  
 batch 107 d\_loss : 0.012273  
 batch 107 g\_loss : 4.617520  
 batch 108 d\_loss : 0.012736  
 batch 108 g\_loss : 4.616237  
 batch 109 d\_loss : 0.014369  
 batch 109 g\_loss : 4.725221  
 batch 110 d\_loss : 0.014161  
 batch 110 g\_loss : 4.757148  
 batch 111 d\_loss : 0.012221  
 batch 111 g\_loss : 4.610887  
 batch 112 d\_loss : 0.011637  
 batch 112 g\_loss : 4.710553  
 batch 113 d\_loss : 0.013689  
 batch 113 g\_loss : 4.639868  
 batch 114 d\_loss : 0.012519  
 batch 114 g\_loss : 4.657958  
 batch 115 d\_loss : 0.009945  
 batch 115 g\_loss : 4.694889  
 batch 116 d\_loss : 0.013620  
 batch 116 g\_loss : 4.674292  
 batch 117 d\_loss : 0.011378  
 batch 117 g\_loss : 4.719099  
 batch 118 d\_loss : 0.013047  
 batch 118 g\_loss : 4.695825  
 batch 119 d\_loss : 0.014239  
 batch 119 g\_loss : 4.631382  
 batch 120 d\_loss : 0.012364  
 batch 120 g\_loss : 4.771619  
 batch 121 d\_loss : 0.012363  
 batch 121 g\_loss : 4.748231  
 batch 122 d\_loss : 0.013318  
 batch 122 g\_loss : 4.723729  
 batch 123 d\_loss : 0.013111

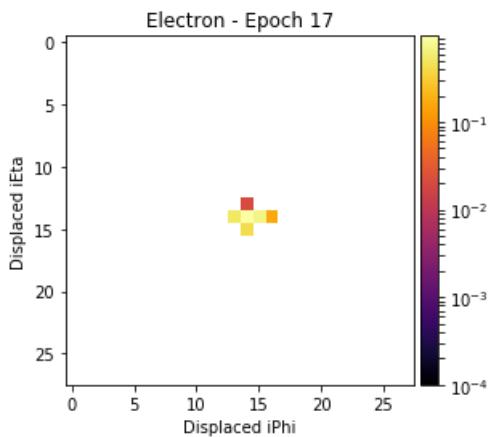
```

batch 123 g_loss : 4.777684
batch 124 d_loss : 0.011484
batch 124 g_loss : 4.774077
batch 125 d_loss : 0.013850
batch 125 g_loss : 4.686533
batch 126 d_loss : 0.013664
batch 126 g_loss : 4.663021
batch 127 d_loss : 0.012237
batch 127 g_loss : 4.679063
batch 128 d_loss : 0.014148
batch 128 g_loss : 4.625935
batch 129 d_loss : 0.013418
batch 129 g_loss : 4.726192
Epoch is 17
Number of batches 130
batch 0 d_loss : 0.009366
batch 0 g_loss : 4.749268

```

Layer (type)	Output Shape	Param #
dense_277 (Dense)	(None, 1024)	103424
activation_553 (Activation)	(None, 1024)	0
dense_278 (Dense)	(None, 6272)	6428800
batch_normalization_136 (Batch Normalization)	(None, 6272)	25088
activation_554 (Activation)	(None, 6272)	0
reshape_136 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_271 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_277 (Conv2D)	(None, 14, 14, 64)	204864
activation_555 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_272 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_278 (Conv2D)	(None, 28, 28, 1)	1601
activation_556 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.013787
batch 1 g_loss : 4.693871
batch 2 d_loss : 0.011142
batch 2 g_loss : 4.698283
batch 3 d_loss : 0.010063

```

batch 3 g\_loss : 4.644214  
batch 4 d\_loss : 0.013925  
batch 4 g\_loss : 4.790831  
batch 5 d\_loss : 0.011833  
batch 5 g\_loss : 4.752014  
batch 6 d\_loss : 0.014635  
batch 6 g\_loss : 4.728293  
batch 7 d\_loss : 0.016076  
batch 7 g\_loss : 4.709431  
batch 8 d\_loss : 0.015508  
batch 8 g\_loss : 4.743598  
batch 9 d\_loss : 0.012714  
batch 9 g\_loss : 4.749398  
batch 10 d\_loss : 0.015315  
batch 10 g\_loss : 4.769877  
batch 11 d\_loss : 0.013942  
batch 11 g\_loss : 4.710308  
batch 12 d\_loss : 0.014860  
batch 12 g\_loss : 4.673972  
batch 13 d\_loss : 0.012709  
batch 13 g\_loss : 4.840689  
batch 14 d\_loss : 0.012672  
batch 14 g\_loss : 4.706580  
batch 15 d\_loss : 0.016021  
batch 15 g\_loss : 4.801295  
batch 16 d\_loss : 0.013748  
batch 16 g\_loss : 4.716684  
batch 17 d\_loss : 0.010972  
batch 17 g\_loss : 4.714784  
batch 18 d\_loss : 0.013396  
batch 18 g\_loss : 4.710669  
batch 19 d\_loss : 0.012506  
batch 19 g\_loss : 4.752921  
batch 20 d\_loss : 0.011476  
batch 20 g\_loss : 4.768406  
batch 21 d\_loss : 0.013274  
batch 21 g\_loss : 4.721798  
batch 22 d\_loss : 0.013910  
batch 22 g\_loss : 4.777996  
batch 23 d\_loss : 0.012432  
batch 23 g\_loss : 4.704134  
batch 24 d\_loss : 0.010472  
batch 24 g\_loss : 4.774630  
batch 25 d\_loss : 0.016391  
batch 25 g\_loss : 4.817824  
batch 26 d\_loss : 0.010360  
batch 26 g\_loss : 4.805321  
batch 27 d\_loss : 0.010370  
batch 27 g\_loss : 4.791546  
batch 28 d\_loss : 0.013647  
batch 28 g\_loss : 4.726285  
batch 29 d\_loss : 0.012783  
batch 29 g\_loss : 4.758516  
batch 30 d\_loss : 0.010504  
batch 30 g\_loss : 4.717739  
batch 31 d\_loss : 0.011400  
batch 31 g\_loss : 4.827301  
batch 32 d\_loss : 0.011059  
batch 32 g\_loss : 4.815448  
batch 33 d\_loss : 0.010022  
batch 33 g\_loss : 4.796193  
batch 34 d\_loss : 0.013038  
batch 34 g\_loss : 4.800638  
batch 35 d\_loss : 0.012340  
batch 35 g\_loss : 4.837382  
batch 36 d\_loss : 0.010811  
batch 36 g\_loss : 4.978303  
batch 37 d\_loss : 0.012404  
batch 37 g\_loss : 4.822012  
batch 38 d\_loss : 0.011338  
batch 38 g\_loss : 4.731357  
batch 39 d\_loss : 0.011529

batch 39 g\_loss : 4.915406  
batch 40 d\_loss : 0.013654  
batch 40 g\_loss : 4.763211  
batch 41 d\_loss : 0.011357  
batch 41 g\_loss : 4.869619  
batch 42 d\_loss : 0.009429  
batch 42 g\_loss : 4.827329  
batch 43 d\_loss : 0.013547  
batch 43 g\_loss : 4.775036  
batch 44 d\_loss : 0.010171  
batch 44 g\_loss : 4.765636  
batch 45 d\_loss : 0.010760  
batch 45 g\_loss : 4.861835  
batch 46 d\_loss : 0.014025  
batch 46 g\_loss : 4.842027  
batch 47 d\_loss : 0.012835  
batch 47 g\_loss : 4.772670  
batch 48 d\_loss : 0.013933  
batch 48 g\_loss : 4.873678  
batch 49 d\_loss : 0.013271  
batch 49 g\_loss : 4.852469  
batch 50 d\_loss : 0.015215  
batch 50 g\_loss : 4.838662  
batch 51 d\_loss : 0.010909  
batch 51 g\_loss : 4.881988  
batch 52 d\_loss : 0.011502  
batch 52 g\_loss : 4.831126  
batch 53 d\_loss : 0.008764  
batch 53 g\_loss : 4.966825  
batch 54 d\_loss : 0.012721  
batch 54 g\_loss : 4.842825  
batch 55 d\_loss : 0.012977  
batch 55 g\_loss : 4.831697  
batch 56 d\_loss : 0.011526  
batch 56 g\_loss : 4.804809  
batch 57 d\_loss : 0.012556  
batch 57 g\_loss : 4.858657  
batch 58 d\_loss : 0.011979  
batch 58 g\_loss : 4.841871  
batch 59 d\_loss : 0.010318  
batch 59 g\_loss : 4.866621  
batch 60 d\_loss : 0.010825  
batch 60 g\_loss : 4.876956  
batch 61 d\_loss : 0.013524  
batch 61 g\_loss : 4.858922  
batch 62 d\_loss : 0.016822  
batch 62 g\_loss : 4.846827  
batch 63 d\_loss : 0.010435  
batch 63 g\_loss : 4.938093  
batch 64 d\_loss : 0.010820  
batch 64 g\_loss : 4.961509  
batch 65 d\_loss : 0.011607  
batch 65 g\_loss : 4.872477  
batch 66 d\_loss : 0.013952  
batch 66 g\_loss : 5.008512  
batch 67 d\_loss : 0.010851  
batch 67 g\_loss : 4.903679  
batch 68 d\_loss : 0.014900  
batch 68 g\_loss : 4.862568  
batch 69 d\_loss : 0.013370  
batch 69 g\_loss : 5.014913  
batch 70 d\_loss : 0.011828  
batch 70 g\_loss : 4.905622  
batch 71 d\_loss : 0.011073  
batch 71 g\_loss : 4.907768  
batch 72 d\_loss : 0.012997  
batch 72 g\_loss : 4.829140  
batch 73 d\_loss : 0.011176  
batch 73 g\_loss : 4.859915  
batch 74 d\_loss : 0.010996  
batch 74 g\_loss : 4.868514  
batch 75 d\_loss : 0.015917

```

batch 75 g_loss : 4.924222
batch 76 d_loss : 0.010416
batch 76 g_loss : 4.899631
batch 77 d_loss : 0.011196
batch 77 g_loss : 4.927134
batch 78 d_loss : 0.014416
batch 78 g_loss : 4.851264
batch 79 d_loss : 0.011009
batch 79 g_loss : 4.948611
batch 80 d_loss : 0.013410
batch 80 g_loss : 4.897236
batch 81 d_loss : 0.013306
batch 81 g_loss : 4.960810
batch 82 d_loss : 0.013268
batch 82 g_loss : 4.856126
batch 83 d_loss : 0.009502
batch 83 g_loss : 4.847255
batch 84 d_loss : 0.012004
batch 84 g_loss : 4.852374
batch 85 d_loss : 0.014654
batch 85 g_loss : 4.869627
batch 86 d_loss : 0.010285
batch 86 g_loss : 4.902126
batch 87 d_loss : 0.013806
batch 87 g_loss : 4.891142
batch 88 d_loss : 0.011494
batch 88 g_loss : 4.861043
batch 89 d_loss : 0.009956
batch 89 g_loss : 4.968246
batch 90 d_loss : 0.010227
batch 90 g_loss : 4.912670
batch 91 d_loss : 0.010606
batch 91 g_loss : 4.935728
batch 92 d_loss : 0.013019
batch 92 g_loss : 4.839973
batch 93 d_loss : 0.012566
batch 93 g_loss : 4.919442
batch 94 d_loss : 0.012547
batch 94 g_loss : 4.923606
batch 95 d_loss : 0.011550
batch 95 g_loss : 4.883719
batch 96 d_loss : 0.013189
batch 96 g_loss : 4.993147
batch 97 d_loss : 0.013228
batch 97 g_loss : 5.045042
batch 98 d_loss : 0.010178
batch 98 g_loss : 5.092483
batch 99 d_loss : 0.011681
batch 99 g_loss : 4.965421
batch 100 d_loss : 0.010677
batch 100 g_loss : 5.033316

```

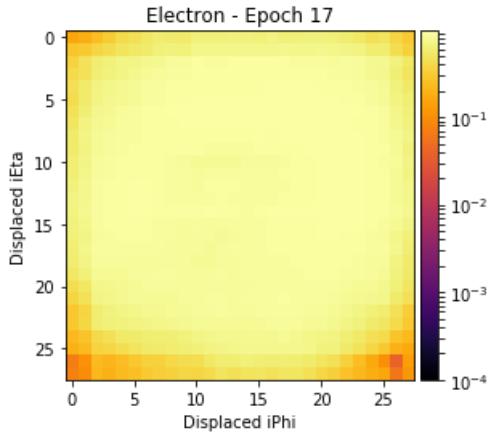
Layer (type)	Output Shape	Param #
dense_279 (Dense)	(None, 1024)	103424
activation_557 (Activation)	(None, 1024)	0
dense_280 (Dense)	(None, 6272)	6428800
batch_normalization_137 (Batch Normalization)	(None, 6272)	25088
activation_558 (Activation)	(None, 6272)	0
reshape_137 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_273 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_279 (Conv2D)	(None, 14, 14, 64)	204864
activation_559 (Activation)	(None, 14, 14, 64)	0

up_sampling2d_274	(UpSampling2D)	(None, 28, 28, 64)	0
conv2d_280	(Conv2D)	(None, 28, 28, 1)	1601
activation_560	(Activation)	(None, 28, 28, 1)	0

---

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544

---



```

batch 101 d_loss : 0.011459
batch 101 g_loss : 4.888603
batch 102 d_loss : 0.012030
batch 102 g_loss : 4.942689
batch 103 d_loss : 0.011129
batch 103 g_loss : 5.012067
batch 104 d_loss : 0.010126
batch 104 g_loss : 4.972641
batch 105 d_loss : 0.011057
batch 105 g_loss : 5.015703
batch 106 d_loss : 0.011439
batch 106 g_loss : 4.995325
batch 107 d_loss : 0.011297
batch 107 g_loss : 4.956253
batch 108 d_loss : 0.010903
batch 108 g_loss : 5.002146
batch 109 d_loss : 0.011511
batch 109 g_loss : 4.975988
batch 110 d_loss : 0.010503
batch 110 g_loss : 4.989843
batch 111 d_loss : 0.011516
batch 111 g_loss : 4.920379
batch 112 d_loss : 0.012334
batch 112 g_loss : 4.970021
batch 113 d_loss : 0.012904
batch 113 g_loss : 5.001276
batch 114 d_loss : 0.011918
batch 114 g_loss : 5.043482
batch 115 d_loss : 0.009138
batch 115 g_loss : 4.991853
batch 116 d_loss : 0.012607
batch 116 g_loss : 4.983041
batch 117 d_loss : 0.009819
batch 117 g_loss : 5.034179
batch 118 d_loss : 0.012348
batch 118 g_loss : 5.041556
batch 119 d_loss : 0.013071
batch 119 g_loss : 5.056628
batch 120 d_loss : 0.010638
batch 120 g_loss : 5.079170
batch 121 d_loss : 0.011664
batch 121 g_loss : 4.968512
batch 122 d_loss : 0.011767
batch 122 g_loss : 5.012012

```

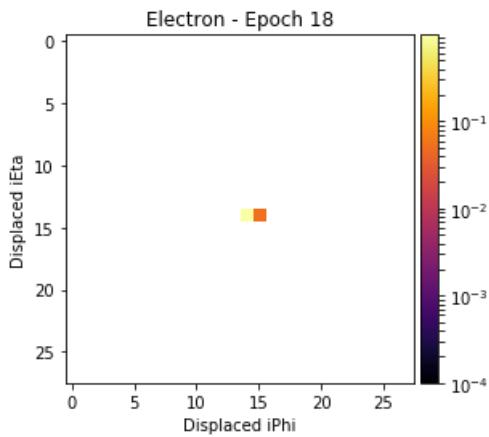
```

batch 122 g_loss : 5.072572
batch 123 d_loss : 0.012137
batch 123 g_loss : 4.993930
batch 124 d_loss : 0.009452
batch 124 g_loss : 5.098671
batch 125 d_loss : 0.013315
batch 125 g_loss : 5.062159
batch 126 d_loss : 0.011797
batch 126 g_loss : 5.057668
batch 127 d_loss : 0.011498
batch 127 g_loss : 5.013307
batch 128 d_loss : 0.013383
batch 128 g_loss : 5.109964
batch 129 d_loss : 0.010524
batch 129 g_loss : 5.164337
Epoch is 18
Number of batches 130
batch 0 d_loss : 0.008531
batch 0 g_loss : 5.014053

```

Layer (type)	Output Shape	Param #
dense_281 (Dense)	(None, 1024)	103424
activation_561 (Activation)	(None, 1024)	0
dense_282 (Dense)	(None, 6272)	6428800
batch_normalization_138 (Batch Normalization)	(None, 6272)	25088
activation_562 (Activation)	(None, 6272)	0
reshape_138 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_275 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_281 (Conv2D)	(None, 14, 14, 64)	204864
activation_563 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_276 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_282 (Conv2D)	(None, 28, 28, 1)	1601
activation_564 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544



```

batch 1 d_loss : 0.012233
batch 1 g_loss : 5.145069
batch 2 d_loss : 0.011157
batch 2 g_loss : 5.093122

```

```
batch 3 d_loss : 0.009119
batch 3 g_loss : 5.101406
batch 4 d_loss : 0.012505
batch 4 g_loss : 5.075176
batch 5 d_loss : 0.012259
batch 5 g_loss : 5.142508
batch 6 d_loss : 0.014696
batch 6 g_loss : 5.045271
batch 7 d_loss : 0.013351
batch 7 g_loss : 5.048848
batch 8 d_loss : 0.012146
batch 8 g_loss : 5.069145
batch 9 d_loss : 0.012943
batch 9 g_loss : 5.030660
batch 10 d_loss : 0.012694
batch 10 g_loss : 5.197453
batch 11 d_loss : 0.012278
batch 11 g_loss : 5.049357
batch 12 d_loss : 0.013831
batch 12 g_loss : 5.199618
batch 13 d_loss : 0.010658
batch 13 g_loss : 5.155994
batch 14 d_loss : 0.011795
batch 14 g_loss : 5.045804
batch 15 d_loss : 0.013721
batch 15 g_loss : 5.128332
batch 16 d_loss : 0.011254
batch 16 g_loss : 5.050014
batch 17 d_loss : 0.009687
batch 17 g_loss : 5.076233
batch 18 d_loss : 0.012135
batch 18 g_loss : 5.153520
batch 19 d_loss : 0.013222
batch 19 g_loss : 5.127645
batch 20 d_loss : 0.009837
batch 20 g_loss : 5.189573
batch 21 d_loss : 0.012484
batch 21 g_loss : 5.102349
batch 22 d_loss : 0.012928
batch 22 g_loss : 5.168699
batch 23 d_loss : 0.010401
batch 23 g_loss : 5.119323
batch 24 d_loss : 0.009387
batch 24 g_loss : 5.197312
batch 25 d_loss : 0.013864
batch 25 g_loss : 5.128882
batch 26 d_loss : 0.010187
batch 26 g_loss : 5.113961
batch 27 d_loss : 0.009829
batch 27 g_loss : 5.143151
batch 28 d_loss : 0.011458
batch 28 g_loss : 5.179561
batch 29 d_loss : 0.012759
batch 29 g_loss : 5.155516
batch 30 d_loss : 0.010234
batch 30 g_loss : 5.098599
batch 31 d_loss : 0.010925
batch 31 g_loss : 5.101660
batch 32 d_loss : 0.009302
batch 32 g_loss : 5.052042
batch 33 d_loss : 0.010856
batch 33 g_loss : 5.229911
batch 34 d_loss : 0.011816
batch 34 g_loss : 5.078219
batch 35 d_loss : 0.011427
batch 35 g_loss : 5.152432
batch 36 d_loss : 0.010794
batch 36 g_loss : 5.152535
batch 37 d_loss : 0.009874
batch 37 g_loss : 5.207730
batch 38 d_loss : 0.010701
batch 38 g_loss : 5.081954
```

```
batch 39 d_loss : 0.008093
batch 39 g_loss : 5.132759
batch 40 d_loss : 0.012136
batch 40 g_loss : 5.097055
batch 41 d_loss : 0.009793
batch 41 g_loss : 5.123349
batch 42 d_loss : 0.008296
batch 42 g_loss : 5.186252
batch 43 d_loss : 0.012291
batch 43 g_loss : 5.269054
batch 44 d_loss : 0.007973
batch 44 g_loss : 5.200377
batch 45 d_loss : 0.010513
batch 45 g_loss : 5.227833
batch 46 d_loss : 0.013415
batch 46 g_loss : 5.161674
batch 47 d_loss : 0.011948
batch 47 g_loss : 5.240469
batch 48 d_loss : 0.010856
batch 48 g_loss : 5.185074
batch 49 d_loss : 0.011204
batch 49 g_loss : 5.103918
batch 50 d_loss : 0.013252
batch 50 g_loss : 5.224765
batch 51 d_loss : 0.011247
batch 51 g_loss : 5.185053
batch 52 d_loss : 0.013470
batch 52 g_loss : 5.171288
batch 53 d_loss : 0.007139
batch 53 g_loss : 5.131844
batch 54 d_loss : 0.011686
batch 54 g_loss : 5.196202
batch 55 d_loss : 0.012855
batch 55 g_loss : 5.173078
batch 56 d_loss : 0.011214
batch 56 g_loss : 5.183122
batch 57 d_loss : 0.009442
batch 57 g_loss : 5.170802
batch 58 d_loss : 0.011899
batch 58 g_loss : 5.184928
batch 59 d_loss : 0.012315
batch 59 g_loss : 5.258996
batch 60 d_loss : 0.010237
batch 60 g_loss : 5.194834
batch 61 d_loss : 0.011442
batch 61 g_loss : 5.267157
batch 62 d_loss : 0.015114
batch 6set[disabled] .btn-link:focus {
    color: #777777;
    text-decoration: none;
}
.btn-lg,
.2 g_loss : 5.372027
batch 63 d_loss : 0.009763
batch 63 g_loss : 5.275951
batch 64 d_loss : 0.010118
batch 64 g_loss : 5.263739
batch 65 d_loss : 0.012198
batch 65 g_loss : 5.176940
batch 66 d_loss : 0.012239
batch 66 g_loss : 5.268001
batch 67 d_loss : 0.010525
batch 67 g_loss : 5.203761
batch 68 d_loss : 0.014716
batch 68 g_loss : 5.249574
batch 69 d_loss : 0.012265
batch 69 g_loss : 5.217320
batch 70 d_loss : 0.011370
batch 70 g_loss : 5.216863
batch 71 d_loss : 0.009908
batch 71 g_loss : 5.282562
batch 72 d_loss : 0.013997
```

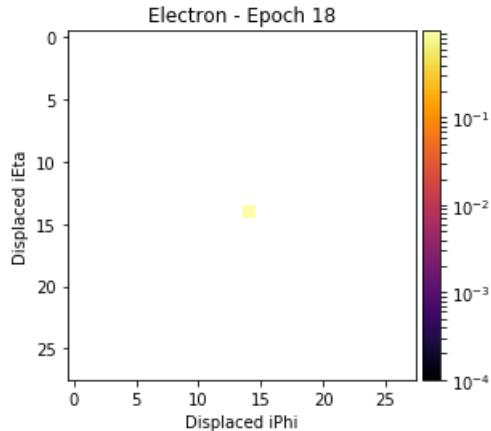
batch 72 g\_loss : 5.213965  
 batch 73 d\_loss : 0.009610  
 batch 73 g\_loss : 5.273920  
 batch 74 d\_loss : 0.009586  
 batch 74 g\_loss : 5.335682  
 batch 75 d\_loss : 0.013179  
 batch 75 g\_loss : 5.249961  
 batch 76 d\_loss : 0.010628  
 batch 76 g\_loss : 5.310892  
 batch 77 d\_loss : 0.010258  
 batch 77 g\_loss : 5.222164  
 batch 78 d\_loss : 0.012189  
 batch 78 g\_loss : 5.230248  
 batch 79 d\_loss : 0.011462  
 batch 79 g\_loss : 5.219027  
 batch 80 d\_loss : 0.014227  
 batch 80 g\_loss : 5.215918  
 batch 81 d\_loss : 0.014415  
 batch 81 g\_loss : 5.363517  
 batch 82 d\_loss : 0.011062  
 batch 82 g\_loss : 5.225168  
 batch 83 d\_loss : 0.008383  
 batch 83 g\_loss : 5.258316  
 batch 84 d\_loss : 0.010698  
 batch 84 g\_loss : 5.265757  
 batch 85 d\_loss : 0.014436  
 batch 85 g\_loss : 5.304695  
 batch 86 d\_loss : 0.011724  
 batch 86 g\_loss : 5.264377  
 batch 87 d\_loss : 0.010371  
 batch 87 g\_loss : 5.230383  
 batch 88 d\_loss : 0.011925  
 batch 88 g\_loss : 5.253493  
 batch 89 d\_loss : 0.009413  
 batch 89 g\_loss : 5.219624  
 batch 90 d\_loss : 0.010898  
 batch 90 g\_loss : 5.261291  
 batch 91 d\_loss : 0.011198  
 batch 91 g\_loss : 5.284819  
 batch 92 d\_loss : 0.013247  
 batch 92 g\_loss : 5.362488  
 batch 93 d\_loss : 0.009671  
 batch 93 g\_loss : 5.363568  
 batch 94 d\_loss : 0.011627  
 batch 94 g\_loss : 5.294552  
 batch 95 d\_loss : 0.011642  
 batch 95 g\_loss : 5.228785  
 batch 96 d\_loss : 0.011496  
 batch 96 g\_loss : 5.338310  
 batch 97 d\_loss : 0.011586  
 batch 97 g\_loss : 5.311452  
 batch 98 d\_loss : 0.009388  
 batch 98 g\_loss : 5.272442  
 batch 99 d\_loss : 0.011643  
 batch 99 g\_loss : 5.289448  
 batch 100 d\_loss : 0.009131  
 batch 100 g\_loss : 5.361427

Layer (type)	Output Shape	Param #
dense_283 (Dense)	(None, 1024)	103424
activation_565 (Activation)	(None, 1024)	0
dense_284 (Dense)	(None, 6272)	6428800
batch_normalization_139 (Batch Normalization)	(None, 6272)	25088
activation_566 (Activation)	(None, 6272)	0
reshape_139 (Reshape)	(None, 7, 7, 128)	0

up_sampling2d_277	(UpSampling2D)	(None, 14, 14, 128)	0
conv2d_283	(Conv2D)	(None, 14, 14, 64)	204864
activation_567	(Activation)	(None, 14, 14, 64)	0
up_sampling2d_278	(UpSampling2D)	(None, 28, 28, 64)	0
conv2d_284	(Conv2D)	(None, 28, 28, 1)	1601
activation_568	(Activation)	(None, 28, 28, 1)	0
<hr/> <hr/> <hr/>			

Total params: 6,763,777  
Trainable params: 6,751,233  
Non-trainable params: 12,544

---



```

batch 101 d_loss : 0.013396
batch 101 g_loss : 5.315764
batch 102 d_loss : 0.010625
batch 102 g_loss : 5.354566
batch 103 d_loss : 0.011160
batch 103 g_loss : 5.298946
batch 104 d_loss : 0.010426
batch 104 g_loss : 5.375586
batch 105 d_loss : 0.012482
batch 105 g_loss : 5.323411
batch 106 d_loss : 0.009678
batch 106 g_loss : 5.363924
batch 107 d_loss : 0.008820
batch 107 g_loss : 5.324637
batch 108 d_loss : 0.012446
batch 108 g_loss : 5.351517
batch 109 d_loss : 0.011615
batch 109 g_loss : 5.410277
batch 110 d_loss : 0.009795
batch 110 g_loss : 5.372523
batch 111 d_loss : 0.012168
batch 111 g_loss : 5.326799
batch 112 d_loss : 0.011754
batch 112 g_loss : 5.416480
batch 113 d_loss : 0.009533
batch 113 g_loss : 5.311788
batch 114 d_loss : 0.012344
batch 114 g_loss : 5.391228
batch 115 d_loss : 0.008849
batch 115 g_loss : 5.330512
batch 116 d_loss : 0.012445
batch 116 g_loss : 5.431859
batch 117 d_loss : 0.010915
batch 117 g_loss : 5.360387
batch 118 d_loss : 0.010613
batch 118 g_loss : 5.443943
batch 119 d_loss : 0.012364
batch 119 g_loss : 5.336280

```

```

batch 119 g_loss : 0.550200
batch 120 d_loss : 0.011274
batch 120 g_loss : 5.441863
batch 121 d_loss : 0.012748
batch 121 g_loss : 5.338424
batch 122 d_loss : 0.010947
batch 122 g_loss : 5.295883
batch 123 d_loss : 0.013808
batch 123 g_loss : 5.356691
batch 124 d_loss : 0.008535
batch 124 g_loss : 5.541433
batch 125 d_loss : 0.013720
batch 125 g_loss : 5.436247
batch 126 d_loss : 0.012233
batch 126 g_loss : 5.413682
batch 127 d_loss : 0.010488
batch 127 g_loss : 5.409496
batch 128 d_loss : 0.012925
batch 128 g_loss : 5.387362
batch 129 d_loss : 0.012585
batch 129 g_loss : 5.462955
Epoch is 19
Number of batches 130
batch 0 d_loss : 0.010161
batch 0 g_loss : 5.344319

```

Layer (type)	Output Shape	Param #
dense_285 (Dense)	(None, 1024)	103424
activation_569 (Activation)	(None, 1024)	0
dense_286 (Dense)	(None, 6272)	6428800
batch_normalization_140 (Batch Normalization)	(None, 6272)	25088
activation_570 (Activation)	(None, 6272)	0
reshape_140 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_279 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_285 (Conv2D)	(None, 14, 14, 64)	204864
activation_571 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_280 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_286 (Conv2D)	(None, 28, 28, 1)	1601
activation_572 (Activation)	(None, 28, 28, 1)	0

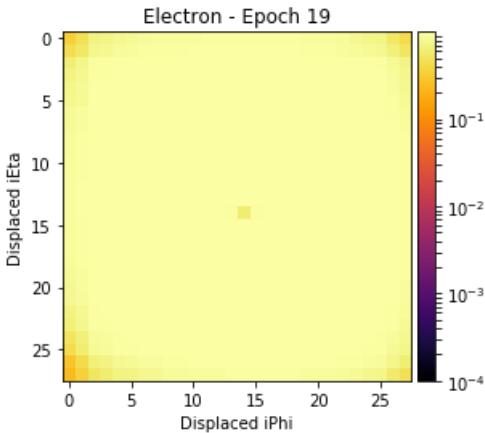
---

```

Total params: 6,763,777
Trainable params: 6,751,233
Non-trainable params: 12,544

```

---



```

batch 1 d_loss : 0.013123
batch 1 g_loss : 5.472945
batch 2 d_loss : 0.011871
batch 2 g_loss : 5.509636
batch 3 d_loss : 0.009057
batch 3 g_loss : 5.490847
batch 4 d_loss : 0.012809
batch 4 g_loss : 5.407557
batch 5 d_loss : 0.011704
batch 5 g_loss : 5.447040
batch 6 d_loss : 0.014897
batch 6 g_loss : 5.465468
batch 7 d_loss : 0.014941
batch 7 g_loss : 5.498278
batch 8 d_loss : 0.013141
batch 8 g_loss : 5.484243
batch 9 d_loss : 0.011670
batch 9 g_loss : 5.439397
batch 10 d_loss : 0.016433
batch 10 g_loss : 5.437451
batch 11 d_loss : 0.011884
batch 11 g_loss : 5.498850
batch 12 d_loss : 0.014175
batch 12 g_loss : 5.502491
batch 13 d_loss : 0.009995
batch 13 g_loss : 5.498418
batch 14 d_loss : 0.011014
batch 14 g_loss : 5.521602
batch 15 d_loss : 0.012548
batch 15 g_loss : 5.446756
batch 16 d_loss : 0.011374
batch 16 g_loss : 5.531252
batch 17 d_loss : 0.010164
batch 17 g_loss : 5.451039
batch 18 d_loss : 0.013917
batch 18 g_loss : 5.464125
batch 19 d_loss : 0.011924
batch 19 g_loss : 5.437346
batch 20 d_loss : 0.010856
batch 20 g_loss : 5.482624
batch 21 d_loss : 0.012497
batch 21 g_loss : 5.561841
batch 22 d_loss : 0.013580
batch 22 g_loss : 5.507301
batch 23 d_loss : 0.010030
batch 23 g_loss : 5.502389
batch 24 d_loss : 0.009469
batch 24 g_loss : 5.471489
batch 25 d_loss : 0.015384
batch 25 g_loss : 5.509233
batch 26 d_loss : 0.011230
batch 26 g_loss : 5.529579
batch 27 d_loss : 0.011851
batch 27 g_loss : 5.474262

```

batch 27 g\_loss : 5.171292  
batch 28 d\_loss : 0.012205  
batch 28 g\_loss : 5.435631  
batch 29 d\_loss : 0.012334  
batch 29 g\_loss : 5.566334  
batch 30 d\_loss : 0.007903  
batch 30 g\_loss : 5.515976  
batch 31 d\_loss : 0.014921  
batch 31 g\_loss : 5.533998  
batch 32 d\_loss : 0.008836  
batch 32 g\_loss : 5.543376  
batch 33 d\_loss : 0.009962  
batch 33 g\_loss : 5.508093  
batch 34 d\_loss : 0.011793  
batch 34 g\_loss : 5.594422  
batch 35 d\_loss : 0.011422  
batch 35 g\_loss : 5.524797  
batch 36 d\_loss : 0.013410  
batch 36 g\_loss : 5.520298  
batch 37 d\_loss : 0.008936  
batch 37 g\_loss : 5.528090  
batch 38 d\_loss : 0.013734  
batch 38 g\_loss : 5.545864  
batch 39 d\_loss : 0.010639  
batch 39 g\_loss : 5.598961  
batch 40 d\_loss : 0.014626  
batch 40 g\_loss : 5.575648  
batch 41 d\_loss : 0.012771  
batch 41 g\_loss : 5.536111  
batch 42 d\_loss : 0.012307  
batch 42 g\_loss : 5.650752  
batch 43 d\_loss : 0.011967  
batch 43 g\_loss : 5.583678  
batch 44 d\_loss : 0.012146  
batch 44 g\_loss : 5.615921  
batch 45 d\_loss : 0.013162  
batch 45 g\_loss : 5.561896  
batch 46 d\_loss : 0.013967  
batch 46 g\_loss : 5.624707  
batch 47 d\_loss : 0.012249  
batch 47 g\_loss : 5.650248  
batch 48 d\_loss : 0.013809  
batch 48 g\_loss : 5.570669  
batch 49 d\_loss : 0.012747  
batch 49 g\_loss : 5.583447  
batch 50 d\_loss : 0.014220  
batch 50 g\_loss : 5.559609  
batch 51 d\_loss : 0.012092  
batch 51 g\_loss : 5.543855  
batch 52 d\_loss : 0.012238  
batch 52 g\_loss : 5.585521  
batch 53 d\_loss : 0.008163  
batch 53 g\_loss : 5.591420  
batch 54 d\_loss : 0.013011  
batch 54 g\_loss : 5.646266  
batch 55 d\_loss : 0.014460  
batch 55 g\_loss : 5.714648  
batch 56 d\_loss : 0.010462  
batch 56 g\_loss : 5.600000  
batch 57 d\_loss : 0.013424  
batch 57 g\_loss : 5.626823  
batch 58 d\_loss : 0.011594  
batch 58 g\_loss : 5.696460  
batch 59 d\_loss : 0.012790  
batch 59 g\_loss : 5.610496  
batch 60 d\_loss : 0.011934  
batch 60 g\_loss : 5.636958  
batch 61 d\_loss : 0.015179  
batch 61 g\_loss : 5.650454  
batch 62 d\_loss : 0.017232  
batch 62 g\_loss : 5.624563  
batch 63 d\_loss : 0.009375  
batch 63 g\_loss : 5.644872

batch 64 d\_loss : 0.010945  
batch 64 g\_loss : 5.621014  
batch 65 d\_loss : 0.012635  
batch 65 g\_loss : 5.668684  
batch 66 d\_loss : 0.015065  
batch 66 g\_loss : 5.668930  
batch 67 d\_loss : 0.010245  
batch 67 g\_loss : 5.675430  
batch 68 d\_loss : 0.016323  
batch 68 g\_loss : 5.599813  
batch 69 d\_loss : 0.017528  
batch 69 g\_loss : 5.666615  
batch 70 d\_loss : 0.012463  
batch 70 g\_loss : 5.704508  
batch 71 d\_loss : 0.009859  
batch 71 g\_loss : 5.648119  
batch 72 d\_loss : 0.016245  
batch 72 g\_loss : 5.667140  
batch 73 d\_loss : 0.011253  
batch 73 g\_loss : 5.699862  
batch 74 d\_loss : 0.012679  
batch 74 g\_loss : 5.699965  
batch 75 d\_loss : 0.014165  
batch 75 g\_loss : 5.650151  
batch 76 d\_loss : 0.011377  
batch 76 g\_loss : 5.698995  
batch 77 d\_loss : 0.011817  
batch 77 g\_loss : 5.697988  
batch 78 d\_loss : 0.013955  
batch 78 g\_loss : 5.678408  
batch 79 d\_loss : 0.013560  
batch 79 g\_loss : 5.614250  
batch 80 d\_loss : 0.011397  
batch 80 g\_loss : 5.747878  
batch 81 d\_loss : 0.015191  
batch 81 g\_loss : 5.708364  
batch 82 d\_loss : 0.012401  
batch 82 g\_loss : 5.675097  
batch 83 d\_loss : 0.011231  
batch 83 g\_loss : 5.770756  
batch 84 d\_loss : 0.011535  
batch 84 g\_loss : 5.697670  
batch 85 d\_loss : 0.016738  
batch 85 g\_loss : 5.802315  
batch 86 d\_loss : 0.013180  
batch 86 g\_loss : 5.729744  
batch 87 d\_loss : 0.010954  
batch 87 g\_loss : 5.680521  
batch 88 d\_loss : 0.012187  
batch 88 g\_loss : 5.653672  
batch 89 d\_loss : 0.013798  
batch 89 g\_loss : 5.724360  
batch 90 d\_loss : 0.013319  
batch 90 g\_loss : 5.754665  
batch 91 d\_loss : 0.009833  
batch 91 g\_loss : 5.769156  
batch 92 d\_loss : 0.014490  
batch 92 g\_loss : 5.727877  
batch 93 d\_loss : 0.015577  
batch 93 g\_loss : 5.700119  
batch 94 d\_loss : 0.016683  
batch 94 g\_loss : 5.726836  
batch 95 d\_loss : 0.010816  
batch 95 g\_loss : 5.739236  
batch 96 d\_loss : 0.014942  
batch 96 g\_loss : 5.737343  
batch 97 d\_loss : 0.014296  
batch 97 g\_loss : 5.699821  
batch 98 d\_loss : 0.011172  
batch 98 g\_loss : 5.744003  
batch 99 d\_loss : 0.015485  
batch 99 σ loss : 5.800403

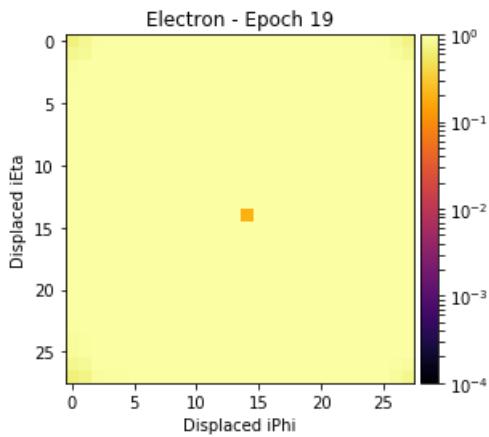
```
batch 100 d_loss : 0.013341  
batch 100 g_loss : 5.752222
```

Layer (type)	Output Shape	Param #
dense_287 (Dense)	(None, 1024)	103424
activation_573 (Activation)	(None, 1024)	0
dense_288 (Dense)	(None, 6272)	6428800
batch_normalization_141 (Batch Normalization)	(None, 6272)	25088
activation_574 (Activation)	(None, 6272)	0
reshape_141 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_281 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_287 (Conv2D)	(None, 14, 14, 64)	204864
activation_575 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_282 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_288 (Conv2D)	(None, 28, 28, 1)	1601
activation_576 (Activation)	(None, 28, 28, 1)	0

Total params: 6,763,777

Trainable params: 6,751,233

Non-trainable params: 12,544



```
batch 101 d_loss : 0.015153
batch 101 g_loss : 5.753789
batch 102 d_loss : 0.014098
batch 102 g_loss : 5.803601
batch 103 d_loss : 0.014020
batch 103 g_loss : 5.735813
batch 104 d_loss : 0.013746
batch 104 g_loss : 5.787023
batch 105 d_loss : 0.014226
batch 105 g_loss : 5.817309
batch 106 d_loss : 0.011748
batch 106 g_loss : 5.837153
batch 107 d_loss : 0.014145
batch 107 g_loss : 5.852786
batch 108 d_loss : 0.013208
batch 108 g_loss : 5.856537
batch 109 d_loss : 0.015978
batch 109 g_loss : 5.863543
batch 110 d_loss : 0.012805
batch 110 g_loss : 5.838580
batch 111 d_loss : 0.011030
batch 111 g_loss : 5.837763
batch 112 d_loss : 0.013545
batch 112 g_loss : 5.861631
batch 113 d_loss : 0.011050
batch 113 g_loss : 5.834037
batch 114 d_loss : 0.017191
batch 114 g_loss : 5.891690
batch 115 d_loss : 0.010758
batch 115 g_loss : 5.813836
batch 116 d_loss : 0.014444
batch 116 g_loss : 5.846255
batch 117 d_loss : 0.011817
batch 117 g_loss : 5.856709
batch 118 d_loss : 0.015282
batch 118 g_loss : 5.883799
batch 119 d_loss : 0.014988
batch 119 g_loss : 5.894760
batch 120 d_loss : 0.012345
batch 120 g_loss : 5.874393
batch 121 d_loss : 0.012868
batch 121 g_loss : 5.884197
batch 122 d_loss : 0.013940
batch 122 g_loss : 5.877376
batch 123 d_loss : 0.015342
batch 123 g_loss : 5.930740
batch 124 d_loss : 0.011362
batch 124 g_loss : 5.904757
batch 125 d_loss : 0.015815
batch 125 g_loss : 5.907967
batch 126 d_loss : 0.015490
batch 126 g_loss : 5.881673
batch 127 d_loss : 0.012445
batch 127 g_loss : 5.932915
batch 128 d_loss : 0.011707
batch 128 g_loss : 5.881206
batch 129 d_loss : 0.016173
batch 129 g_loss : 5.955826
```

In [18]:

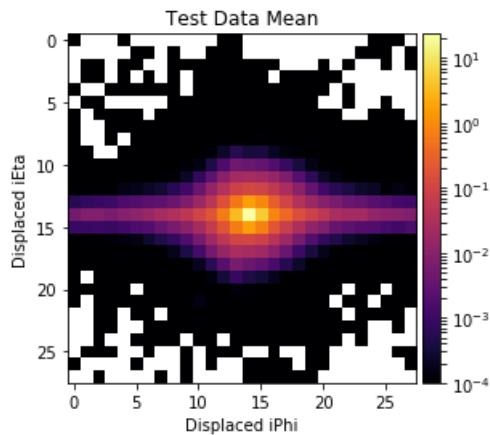
```
_ , X_test = load_data()
```

In [19]:

```
data_mean = np.mean(X_test, axis=0)
```

In [20]:

```
plot_heatmap(data_mean, "Test Data Mean")
```



In [21]:

```
gen_imgs = generate_image_sample(X_test.shape[0])
```

Layer (type)	Output Shape	Param #
dense_289 (Dense)	(None, 1024)	103424
activation_577 (Activation)	(None, 1024)	0
	set[disabled] .btn-link:focus {	
color: #777777;		
text-decoration: none;		
}		
.btn-lg,		
dense_290 (Dense)	(None, 6272)	6428800
batch_normalization_142 (Batch Normalization)	(None, 6272)	25088
activation_578 (Activation)	(None, 6272)	0
reshape_142 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_283 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_289 (Conv2D)	(None, 14, 14, 64)	204864
activation_579 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_284 (UpSampling2D)	(None, 28, 28, 64)	0
conv2d_290 (Conv2D)	(None, 28, 28, 1)	1601
activation_580 (Activation)	(None, 28, 28, 1)	0
<hr/>		
Total params: 6,763,777		
Trainable params: 6,751,233		
Non-trainable params: 12,544		

In [22]:

```
gen_imgs_mean = np.squeeze(np.mean(gen_imgs, axis=0), axis=2)
```

In [23]:

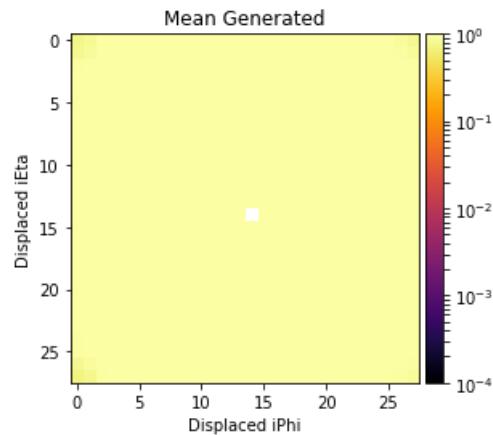
```
gen_imgs_mean.shape
```

Out[23]:

```
(28, 28)
```

In [24]:

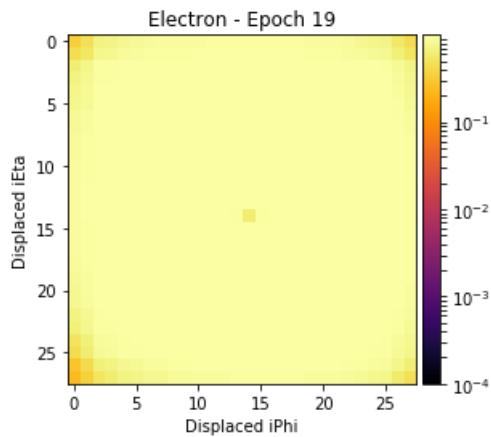
```
plot_heatmap(gen_imgs_mean, "Mean Generated")
```



In [ ]:

```
0      dense_286 (Dense) (None, 6272) 6428800  
      batch_normalization_140 (BatchNorm) (None, 6272) 25088  
      activation_570 (Activation) (None, 6272) 0  
      reshape_140 (Reshape) (None, 7, 7, 128) 0  
      up_sampling2d_279 (UpSampling2D) (None, 14, 14, 128) 0  
      conv2d_285 (Conv2D) (None, 14, 14, 64) 204864  
      activation_571 (Activation) (None, 14, 14, 64) 0  
      up_sampling2d_280 (UpSampling2D) (None, 28, 28, 64) 0  
      conv2d_286 (Conv2D) (None, 28, 28, 1) 1601  
      activation_572 (Activation) (None, 28, 28, 1) 0
```

```
===== Total params: 6,763,777 Trainable params: 6,751,233 Non-trainable params: 12,544
```



```
batch 1 d_loss : 0.013123
batch 1 g_loss : 5.472945
batch 2 d_loss : 0.011871
batch 2 g_loss : 5.509636
batch 3 d_loss : 0.009057
batch 3 g_loss : 5.490847
batch 4 d_loss : 0.012809
batch 4 g_loss : 5.407557
batch 5 d_loss : 0.011704
batch 5 g_loss : 5.447040
batch 6 d_loss : 0.014897
batch 6 g_loss : 5.465468
batch 7 d_loss : 0.014941
batch 7 g_loss : 5.498278
batch 8 d_loss : 0.013141
batch 8 g_loss : 5.484243
batch 9 d_loss : 0.011670
batch 9 g_loss : 5.439397
batch 10 d_loss : 0.016433
batch 10 g_loss : 5.437451
batch 11 d_loss : 0.011884
batch 11 g_loss : 5.498850
batch 12 d_loss : 0.014175
batch 12 g_loss : 5.502491
batch 13 d_loss : 0.009995
batch 13 g_loss : 5.498418
batch 14 d_loss : 0.011014
batch 14 g_loss : 5.521602
batch 15 d_loss : 0.012548
batch 15 g_loss : 5.446756
batch 16 d_loss : 0.011374
batch 16 g_loss : 5.531252
batch 17 d_loss : 0.010164
batch 17 g_loss : 5.451039
batch 18 d_loss : 0.013917
batch 18 g_loss : 5.464125
batch 19 d_loss : 0.011924
batch 19 g_loss : 5.437346
batch 20 d_loss : 0.010856
batch 20 g_loss : 5.482624
batch 21 d_loss : 0.012497
batch 21 g_loss : 5.561841
batch 22 d_loss : 0.013580
batch 22 g_loss : 5.507301
batch 23 d_loss : 0.010030
batch 23 g_loss : 5.502389
batch 24 d_loss : 0.009469
batch 24 g_loss : 5.471489
batch 25 d_loss : 0.015384
batch 25 g_loss : 5.509233
batch 26 d_loss : 0.011230
batch 26 g_loss : 5.529579
batch 27 d_loss : 0.011851
batch 27 g_loss : 5.474262
batch 28 d_loss : 0.012205
batch 28 g_loss : 5.435631
batch 29 d_loss : 0.012334
batch 29 g_loss : 5.566334
batch 30 d_loss : 0.007002
```

batch 29 g\_loss : 5.501905  
batch 30 g\_loss : 5.515976  
batch 31 d\_loss : 0.014921  
batch 31 g\_loss : 5.533998  
batch 32 d\_loss : 0.008836  
batch 32 g\_loss : 5.543376  
batch 33 d\_loss : 0.009962  
batch 33 g\_loss : 5.508093  
batch 34 d\_loss : 0.011793  
batch 34 g\_loss : 5.594422  
batch 35 d\_loss : 0.011422  
batch 35 g\_loss : 5.524797  
batch 36 d\_loss : 0.013410  
batch 36 g\_loss : 5.520298  
batch 37 d\_loss : 0.008936  
batch 37 g\_loss : 5.528090  
batch 38 d\_loss : 0.013734  
batch 38 g\_loss : 5.545864  
batch 39 d\_loss : 0.010639  
batch 39 g\_loss : 5.598961  
batch 40 d\_loss : 0.014626  
batch 40 g\_loss : 5.575648  
batch 41 d\_loss : 0.012771  
batch 41 g\_loss : 5.536111  
batch 42 d\_loss : 0.012307  
batch 42 g\_loss : 5.650752  
batch 43 d\_loss : 0.011967  
batch 43 g\_loss : 5.583678  
batch 44 d\_loss : 0.012146  
batch 44 g\_loss : 5.615921  
batch 45 d\_loss : 0.013162  
batch 45 g\_loss : 5.561896  
batch 46 d\_loss : 0.013967  
batch 46 g\_loss : 5.624707  
batch 47 d\_loss : 0.012249  
batch 47 g\_loss : 5.650248  
batch 48 d\_loss : 0.013809  
batch 48 g\_loss : 5.570669  
batch 49 d\_loss : 0.012747  
batch 49 g\_loss : 5.583447  
batch 50 d\_loss : 0.014220  
batch 50 g\_loss : 5.559609  
batch 51 d\_loss : 0.012092  
batch 51 g\_loss : 5.543855  
batch 52 d\_loss : 0.012238  
batch 52 g\_loss : 5.585521  
batch 53 d\_loss : 0.008163  
batch 53 g\_loss : 5.591420  
batch 54 d\_loss : 0.013011  
batch 54 g\_loss : 5.646266  
batch 55 d\_loss : 0.014460  
batch 55 g\_loss : 5.714648  
batch 56 d\_loss : 0.010462  
batch 56 g\_loss : 5.600000  
batch 57 d\_loss : 0.013424  
batch 57 g\_loss : 5.626823  
batch 58 d\_loss : 0.011594  
batch 58 g\_loss : 5.696460  
batch 59 d\_loss : 0.012790  
batch 59 g\_loss : 5.610496  
batch 60 d\_loss : 0.011934  
batch 60 g\_loss : 5.636958  
batch 61 d\_loss : 0.015179  
batch 61 g\_loss : 5.650454  
batch 62 d\_loss : 0.017232  
batch 62 g\_loss : 5.624563  
batch 63 d\_loss : 0.009375  
batch 63 g\_loss : 5.644872  
batch 64 d\_loss : 0.010945  
batch 64 g\_loss : 5.621014  
batch 65 d\_loss : 0.012635  
batch 65 g\_loss : 5.668684  
batch 66 d\_loss : 0.015065  
batch 66 g\_loss : 5.668930  
batch 67 d\_loss : 0.010245  
batch 67 g\_loss : 5.675430  
batch 68 d\_loss : 0.016323  
batch 68 g\_loss : 5.599813  
batch 69 d\_loss : 0.017528  
batch 69 g\_loss : 5.666615  
batch 70 d\_loss : 0.012463  
batch 70 g\_loss : 5.704508

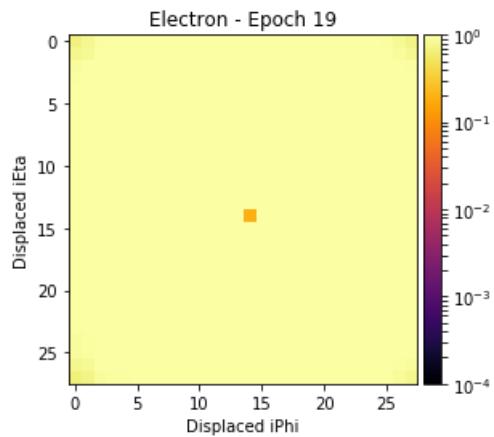
```

batch 71 d_loss : 0.009859
batch 71 g_loss : 5.648119
batch 72 d_loss : 0.016245
batch 72 g_loss : 5.667140
batch 73 d_loss : 0.011253
batch 73 g_loss : 5.699862
batch 74 d_loss : 0.012679
batch 74 g_loss : 5.699965
batch 75 d_loss : 0.014165
batch 75 g_loss : 5.650151
batch 76 d_loss : 0.011377
batch 76 g_loss : 5.698995
batch 77 d_loss : 0.011817
batch 77 g_loss : 5.697988
batch 78 d_loss : 0.013955
batch 78 g_loss : 5.678408
batch 79 d_loss : 0.013560
batch 79 g_loss : 5.614250
batch 80 d_loss : 0.011397
batch 80 g_loss : 5.747878
batch 81 d_loss : 0.015191
batch 81 g_loss : 5.708364
batch 82 d_loss : 0.012401
batch 82 g_loss : 5.675097
batch 83 d_loss : 0.011231
batch 83 g_loss : 5.770756
batch 84 d_loss : 0.011535
batch 84 g_loss : 5.697670
batch 85 d_loss : 0.016738
batch 85 g_loss : 5.802315
batch 86 d_loss : 0.013180
batch 86 g_loss : 5.729744
batch 87 d_loss : 0.010954
batch 87 g_loss : 5.680521
batch 88 d_loss : 0.012187
batch 88 g_loss : 5.653672
batch 89 d_loss : 0.013798
batch 89 g_loss : 5.724360
batch 90 d_loss : 0.013319
batch 90 g_loss : 5.754665
batch 91 d_loss : 0.009833
batch 91 g_loss : 5.769156
batch 92 d_loss : 0.014490
batch 92 g_loss : 5.727877
batch 93 d_loss : 0.015577
batch 93 g_loss : 5.700119
batch 94 d_loss : 0.016683
batch 94 g_loss : 5.726836
batch 95 d_loss : 0.010816
batch 95 g_loss : 5.739236
batch 96 d_loss : 0.014942
batch 96 g_loss : 5.737343
batch 97 d_loss : 0.014296
batch 97 g_loss : 5.699821
batch 98 d_loss : 0.011172
batch 98 g_loss : 5.744003
batch 99 d_loss : 0.015485
batch 99 g_loss : 5.800403
batch 100 d_loss : 0.013341
batch 100 g_loss : 5.752222

```

Layer (type)	Output Shape	Param #
dense_287 (Dense)	(None, 1024)	103424
activation_573 (Activation)	(None, 1024)	0
dense_288 (Dense)	(None, 6272)	6428800
batch_normalization_141 (Batch Normalization)	(None, 6272)	25088
activation_574 (Activation)	(None, 6272)	0
reshape_141 (Reshape)	(None, 7, 7, 128)	0
up_sampling2d_281 (UpSampling2D)	(None, 14, 14, 128)	0
conv2d_287 (Conv2D)	(None, 14, 14, 64)	204864
activation_575 (Activation)	(None, 14, 14, 64)	0
up_sampling2d_282 (UpSampling2D)	(None, 28, 28, 64)	0

conv2d_288 (Conv2D)	(None, 28, 28, 1)	1601
activation_576 (Activation)	(None, 28, 28, 1)	0
=====		
Total params: 6,763,777		
Trainable params: 6,751,233		
Non-trainable params: 12,544		



```
batch 101 d_loss : 0.015153
batch 101 g_loss : 5.753789
batch 102 d_loss : 0.014098
batch 102 g_loss : 5.803601
batch 103 d_loss : 0.014020
batch 103 g_loss : 5.735813
batch 104 d_loss : 0.013746
batch 104 g_loss : 5.787023
batch 105 d_loss : 0.014226
batch 105 g_loss : 5.817309
batch 106 d_loss : 0.011748
batch 106 g_loss : 5.837153
batch 107 d_loss : 0.014145
batch 107 g_loss : 5.852786
batch 108 d_loss : 0.013208
batch 108 g_loss : 5.856537
batch 109 d_loss : 0.015978
batch 109 g_loss : 5.863543
batch 110 d_loss : 0.012805
batch 110 g_loss : 5.838580
batch 111 d_loss : 0.011030
batch 111 g_loss : 5.837763
batch 112 d_loss : 0.013545
batch 112 g_loss : 5.861631
batch 113 d_loss : 0.011050
batch 113 g_loss : 5.834037
batch 114 d_loss : 0.017191
batch 114 g_loss : 5.891690
batch 115 d_loss : 0.010758
batch 115 g_loss : 5.813836
batch 116 d_loss : 0.014444
batch 116 g_loss : 5.846255
batch 117 d_loss : 0.011817
batch 117 g_loss : 5.856709
batch 118 d_loss : 0.015282
batch 118 g_loss : 5.883799
batch 119 d_loss : 0.014988
batch 119 g_loss : 5.894760
batch 120 d_loss : 0.012345
batch 120 g_loss : 5.874393
batch 121 d_loss : 0.012868
batch 121 g_loss : 5.884197
batch 122 d_loss : 0.013940
batch 122 g_loss : 5.877376
batch 123 d_loss : 0.015342
batch 123 g_loss : 5.930740
batch 124 d_loss : 0.011362
batch 124 g_loss : 5.904757
batch 125 d_loss : 0.015815
batch 125 g_loss : 5.907967
batch 126 d_loss : 0.015490
batch 126 g_loss : 5.881673
batch 127 d_loss : 0.012445
batch 127 g_loss : 5.932915
batch 128 d_loss : 0.011707
batch 128 g_loss : 5.881206
batch 129 d_loss : 0.016173
batch 129 g_loss : 5.955826
```

In [18]:

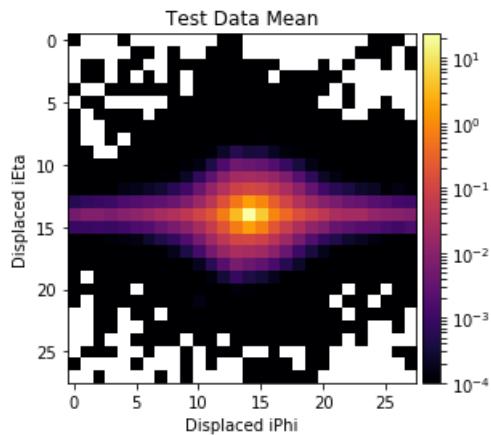
```
, X test = load data()
```

In [19]:

```
data mean = np.mean(X test, axis=0)
```

In [20]:

```
plot heatmap(data mean, "Test Data Mean")
```



In [21]:

```
gen imgs = generate image sample(X test.shape[0])
```

Layer (type)	Output Shape	Param #
dense_289 (Dense)	(None, 1024)	103424
activation_577 (Activation)	(None, 1024)	0