

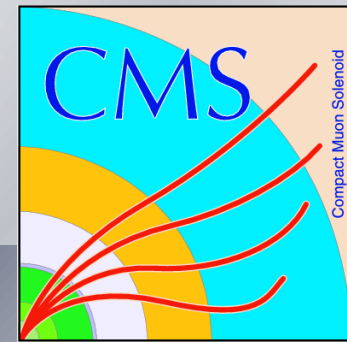


## Introduction to CMSSW:L3

**Presented by**

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# Outlines

- How to write your own analyzer
- Configuration file

# How to write your own analyzer

- You have to have CERN account, for login to lxplus

**ssh -Y OR X username@lxplus.cern.ch**

- Listing the available CMSSW:

**scram list**

- For changing to new architecture

**setenv ARCH <your-new-arch>**

**Example: setenv SCRAM\_ARCH slc6\_amd64\_gcc481**

- Choosing CMSSW By using this command:

**cmsrel CMSSW\_X\_Y\_Z**

- Apply cms environment :

**cmsenv**

# How to write your own analyzer

➤ First, create a subsystem area. The actual name used for the directory is not important, we'll use `First_analysis`.

```
mkdir First_analysis  
cd First_analysis
```

➤ Create the "skeleton" of an EDAnalyzer module

```
mkedanlvr DemoAnalyzer
```

➤ Compile the code:

```
cd DemoAnalyzer  
scram b
```

# Configuration file

Always need to import this

```
import FWCore.ParameterSet.Config as cms
```

A config must always create a cms.Process called process. The label (MAIN in this case) will be applied to any objects added to the root files

```
process = cms.Process("Demo")
```

```
process.load("FWCore.MessageService.MessageLogger_CFI")
```

```
process.maxEvents = cms.untracked.PSet( input = cms.untracked.int32(-1) )
```

```
process.source = cms.Source("PoolSource",
```

```
    # replace 'myfile.root' with the source file you want to use
```

```
    fileNames = cms.untracked.vstring(
```

```
        'file:/afs/cern.ch/cms/Tutorials/TWIKI_DATA/TTJets_8TeV_53X.root'
```

Create a data source, a list of files in this case.

Number of events to process. -1 means process all events in the input files. NB. When submitted jobs to the grid this parameter will be overridden automatically

```
process.demo = cms.EDAnalyzer('DemoAnalyzer'
```

```
)
```

Define some modules. The first argument should be the name of the module as defined in the C++ class (usually the class name). The subsequent named arguments define the parameter set for that module.

The last step is usually to define one or more paths containing the sequence of modules to actually run

```
process.p = cms.Path(process.demo)
```

# BuildFile

SCRAM uses a file called CMS.BuildFile in each package directory which describes what the package will produce and what dependencies the package has. Consider the following CMS.BuildFile from the tutorial:

```
<use name="FWCore/Framework"/>  
  <use name="FWCore/PluginManager"/>  
<use name="FWCore/ParameterSet"/>  
<use name="DataFormats/TrackReco"/>  
  <use name="CommonTools/UtilAlgos"/>  
<flags EDM_PLUGIN="1"/>
```

The first part of the CMS.BuildFile tells SCRAM what packages or external libraries (e.g., **FWCore/Framework**) are needed to build this package. The `<flags>` line is needed because this package contains a framework module (in this case, your analyzer) which must be registered with the plugin system .

# File.cc (DemoAnalyzer)

This file is located in plugin directory in the same place of BuildFile, please go to this directory by using `cd` command. Open it with any editor like pico, vi, vim, gedit, medit, ..

```
#include "DataFormats/TrackReco/interface/Track.h"  
#include "DataFormats/TrackReco/interface/TrackFwd.h"  
#include "FWCore/MessageLogger/interface/MessageLogger.h"
```

- Edit the method `analyze` which starts with

```
DemoAnalyzer::analyze(const edm::Event& iEvent, const edm::EventSetup& iSetup)
```

and put the following lines below using namespace edm;

```
Handle<reco::TrackCollection> tracks;  
iEvent.getByLabel("generalTracks", tracks);  
LogInfo("Demo") << "number of tracks " << tracks->size();
```

```
for (reco::TrackCollection::const_iterator it = tracks->begin(); it !=
tracks->end(); it++){
const reco::Track &track = **it;
```

OR

```
const reco::Track* track = &(*it);
```

YOU CAN PUT ANY CUT here by using if statement

```
if(..... && .....|| ){
    Track_pt    -> Fill(track->pt());
    track_phi   -> Fill(track->phi());
}
}
```



*Thanks!*