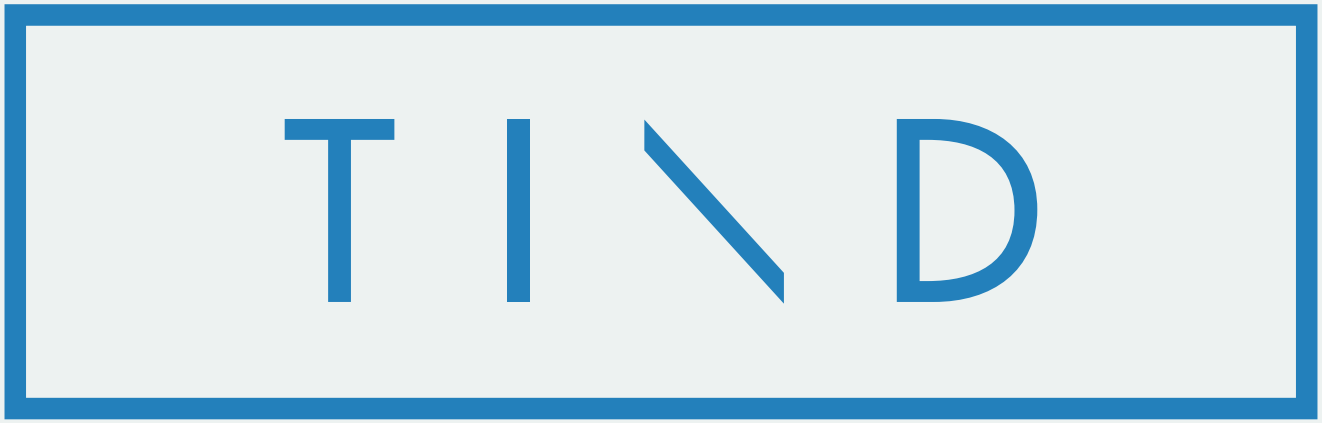


Data migration

CERN-UNESCO School on Digital Libraries, Nov. 29, 2016

Kenneth Hole

spin-off

Agenda

Give you the necessary tools to manipulate and import data to your digital library system.

How?

- Introduction to MARCXML
- Introduction to Reese's MarcEdit
- Introduction to lxml python library
- Demonstrate a simple script

INTRODUCTION TO MARCXML

```
<record>
  <datafield tag="035" ind1=" " ind2=" ">
    <subfield code="a">ocn650875228</subfield>
  </datafield>
  <datafield tag="040" ind1=" " ind2=" ">
    <subfield code="a">GPO</subfield>
    <subfield code="c">GPO</subfield>
    <subfield code="d">MvI</subfield>
  </datafield>
  </datafield>
  <datafield tag="100" ind1="1" ind2=" ">
    <subfield code="a">Snyder, Christopher A.</subfield>
  </datafield>
  <datafield tag="245" ind1="1" ind2="0">
    <subfield code="a">Gas turbine characteristics for a large civil tilt-rotor (LCTR)</subfield>
    <subfield code="h">[electronic resource]  /</subfield>
    <subfield code="c">Christopher A. Snyder, Douglas R. Thurman ; prepared for the 65th Annual Forum and
  </datafield>
  <datafield tag="260" ind1=" " ind2=" ">
    <subfield code="a">Cleveland, Ohio :</subfield>
    <subfield code="b">National Aeronautics and Space Administration, Glenn Research Center,</subfield>
    <subfield code="c">[2010]</subfield>
  </datafield>
</record>
```

Case Study Walkthrough

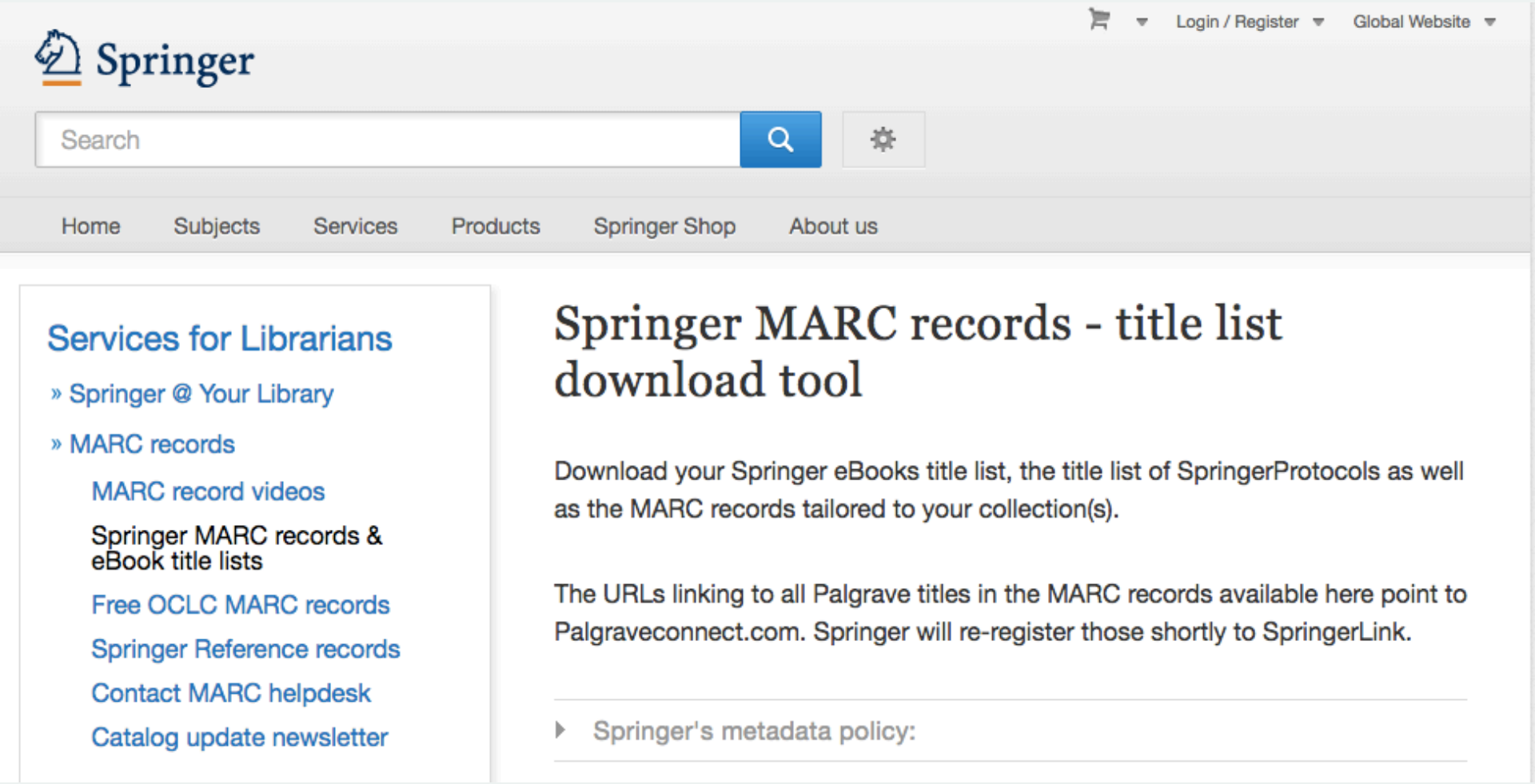
Use case:

Convert Springer OA e-book records to fit Invenio standard.

Steps

Step 1: Download file
Step 2: Convert from .mrc → MARCXML with MarcEdit
Step 3: Convert data using the lxml Python library
Step 4: Upload records

Download File



https://www.springer.com/gp/librarians/marc/marc-records-tool

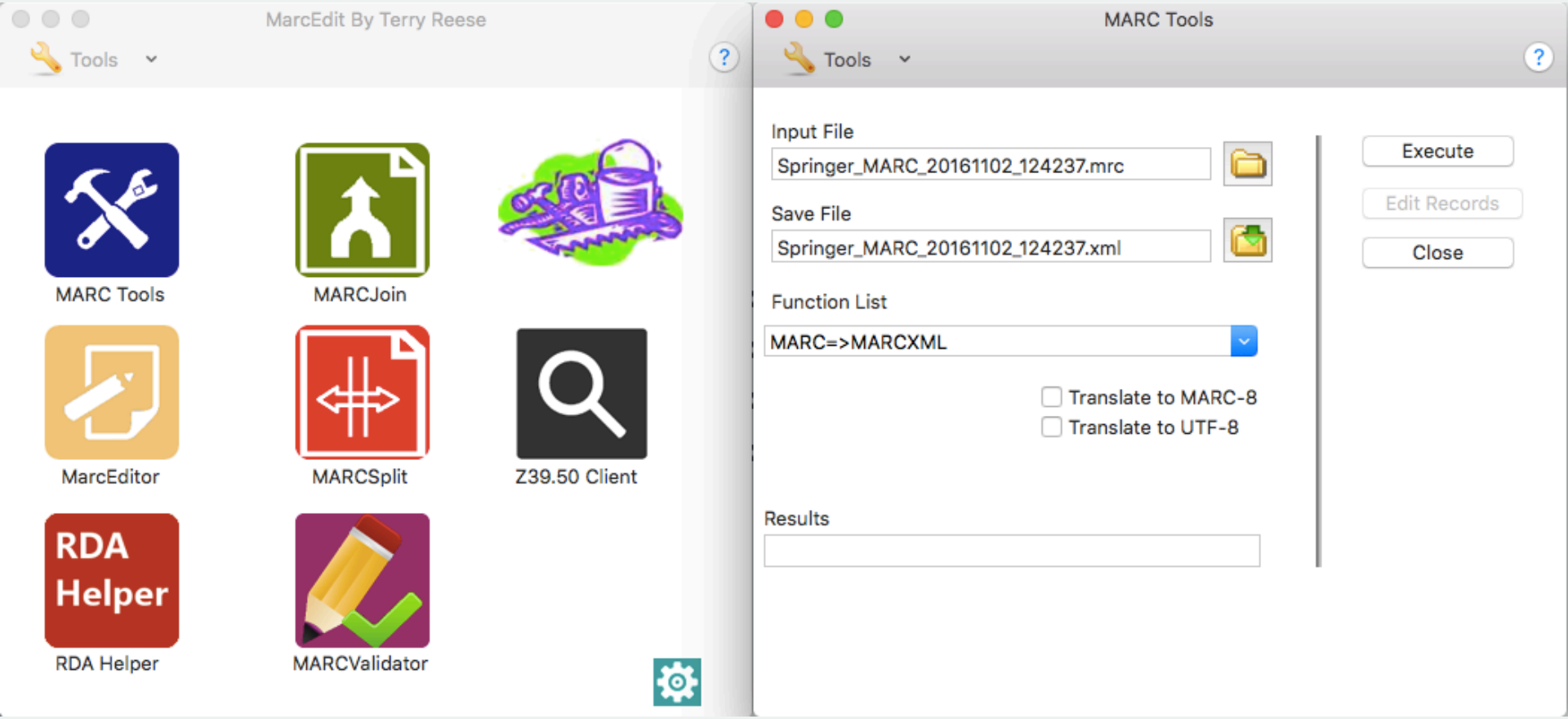
Convert from .mrc → MARCXML with MarcEdit

0 1 9 3 6 n a m a 2 2 0 0 5 0 5 5 i
4500001001800000003000900018005001700027007001500044008004100059020003700100024003100137050001
7001680720018001850720023002030820012002261000031002382450075002692640077003443000033004213360
0260045433700260048033800360050634700240054250600160056652002800058265000160086265000330087865
0003000911650002400941650003600965650003301001650001601034650003501050650003901085650003501124
6500028011596500019011876500024012067100034012307730020012647760036012848560044013209120014013
64950005201378978-0-230-10977-3DE-He21320160316141845.0cr nn 008mamaa151013s2010 xxu| s |||| 0|
eng d a978023010977397 8-0-230-10977-37 a10.1057/978023010977 32doi 4aPN441-1009.5 7aDSBH52bicssc
7aLIT0240002bisacsh04a8092231 aBrown, J. Andrew.eauthor.10aCyborgs in Latin Americah[electronic
resource] /cby J. Andrew Brown. 1aNew York :bPalgrave Macmillan US :bImprint: Palgrave Macmillan,c2010.
aXI, 212 p.bonline resource. atextbtxt2rdacontent acomputerbc2rdamedia aonline resourcebcr2rdacarrier
atext filebPDF2rda0 aOpen Access aA PDF version of this book is available for free in open access via the
OAPEN Library platform, www.oapen.org . Cyborgs in Latin America explores the ways cultural expression in
Latin America has grappled with the changing relationships between technology and human identity.
0aLiterature. 0aCulturexStudy and teaching. 0aEthnologyxLatin America. 0aPhilosophy of mind. 0aPhilosophy
and social sciences. 0aSocial sciencesxPhilosophy.14aLiterature.24aPostcolonial/World Literature.
24aPhilosophy of the Social Sciences.24aRegional and Cultural Studies.24aLatin American Culture.24aSocial
Theory.24aPhilosophy of Mind.2 aSpringerLink (Online service)0 tSpringer eBooks08iPrinted
edition:z978134928835940uhttp://dx.doi.org/10.1057/9780230109773 aZDB-2-PCO aPalgrave Literature
C o l l e c t i o n (S p r i n g e r - 4 1 1 4 1) 0 2 5 1 5 n a m a 2 2 0 0 5 1 7 5 i
4500001001800000003000900018005001700027007001500044008004100059020003700100024003100137050001
1001680720016001790720023001950820012002181000032002302450131002622640077003933000033004703360
0260050333700260052933800360055534700240059150600160061552007910063165000230142265000220144565

Convert from .mrc → XML with MarcEdit

```
<marc:collection>
<marc:record>
<marc:leader>01936nam a22005055i 4500</marc:leader>
<marc:controlfield tag="001">978-0-230-10977-3</marc:controlfield>
<marc:controlfield tag="003">DE-He213</marc:controlfield>
<marc:controlfield tag="005">20160316141845.0</marc:controlfield>
<marc:controlfield tag="007">cr nn 008mamaa</marc:controlfield>
<marc:controlfield tag="008">151013s2010    xxu|    s    |||| 0|eng d</marc:controlfield>
<marc:datafield tag="020" ind1=" " ind2=" ">
    <marc:subfield code="a">9780230109773</marc:subfield>
    <marc:subfield code="9">978-0-230-10977-3</marc:subfield>
</marc:datafield>
<marc:datafield tag="024" ind1="7" ind2=" ">
    <marc:subfield code="a">10.1057/9780230109773</marc:subfield>
    <marc:subfield code="2">doi</marc:subfield></marc:datafield>
<marc:datafield tag="050" ind1=" " ind2="4">
    <marc:subfield code="a">PN441-1009.5</marc:subfield>
</marc:datafield>
<marc:datafield tag="072" ind1=" " ind2="7">
    <marc:subfield code="a">DSBH5</marc:subfield>
    <marc:subfield code="2">bicssc</marc:subfield>
</marc:datafield>
<marc:datafield tag="072" ind1=" " ind2="7">
    <marc:subfield code="a">LIT024000</marc:subfield>
    <marc:subfield code="2">bisacsh</marc:subfield>
</marc:datafield>
<marc:datafield tag="082" ind1="0" ind2="4">
    <marc:subfield code="a">809</marc:subfield>
    <marc:subfield code="2">23</marc:subfield>
</marc:datafield>
<marc:datafield tag="100" ind1="1" ind2=" ">
    <marc:subfield code="a">Brown, J. Andrew.</marc:subfield>
    <marc:subfield code="e">author.</marc:subfield>
</marc:datafield>
<marc:datafield tag="245" ind1="1" ind2="0">
    <marc:subfield code="a">Cyborgs in Latin America</marc:subfield>
    <marc:subfield code="h">[electronic resource] /</marc:subfield>
    <marc:subfield code="c">by J. Andrew Brown.</marc:subfield>
    </marc:datafield>
<marc:datafield tag="264" ind1=" " ind2="1">
    <marc:subfield code="a">New York :</marc:subfield>
    <marc:subfield code="b">Palgrave Macmillan US :</marc:subfield>
    <marc:subfield code="b">Imprint: Palgrave Macmillan,</marc:subfield>
    <marc:subfield code="c">2010.</marc:subfield>
</marc:datafield>
```

Convert from .mrc → MARCXML with MarcEdit



Add URL

Programming techniques

Transformation Process	Programming Technique
Import required Python library	Import
Read XML file and parse into an objects	Read XML and parse it.
Remove data field 001 and 005	Iterate over the object and remove content
Add collection name in data field 980	Iterate over list and add new data field
Write data to new XML file	Create, write and save XML file

Step 1: Import python library

```
# Import the Python library needed to read and
process XML

import lxml.etree as ET
```

Step 2: Read XML and parse it

```
# Read XML and parse it into an object
xml = ET.parse("springer_OA_input.xml")

# Get to the root level (collection)
root = xml.getroot()
```

```
<Element collection at 0x1022dc7e8>
```

Step 3: Iterate over list and remove content

```
# Iterate over all records in the collection
for record in root:
    for field in record:
        if field.tag == 'controlfield':
            if field.attrib['tag'] == "001":
                record.remove(field)
            if field.attrib['tag'] == "005":
                record.remove(field)
```

Step 3: Iterate over list and remove content

```
for record in root:
   # Iterate over all fields in the record
    for field in record:
       if field.tag == 'controlfield’:
          if field.attrib['tag'] == "001":
             record.remove(field)
          if field.attrib['tag'] == "005":
             record.remove(field)
```

Step 3: Iterate over list and remove content

```
for record in root:
    for field in record:
        # If the field tag equals the string ‘controlfield’,
        continue
        if field.tag == 'controlfield’:
            if field.attrib['tag'] == "001":
                record.remove(field)
            if field.attrib['tag'] == "005":
                record.remove(field)
```

Step 3: Iterate over list and remove content

```
for record in root:
    for field in record:
        if field.tag == 'controlfield':
            # If the controlfield attribute equals '001', continue
            if field.attrib['tag'] == "001":
                record.remove(field)
            if field.attrib['tag'] == "005":
                record.remove(field)
```

Step 3: Iterate over list and remove content

```
for record in root:
    for field in record:
        if field.tag == 'controlfield':
            if field.attrib['tag'] == "001":
                # Remove the data field from the record
                record.remove(field)
            if field.attrib['tag'] == "005":
                record.remove(field)
```

Step 3: Iterate over list and remove content

```
for record in root:
    for field in record:
        if field.tag == 'controlfield':
            if field.attrib['tag'] == "001":
                record.remove(field)
            # If the controlfield attribute equals '005', continue
            if field.attrib['tag'] == "005":
                record.remove(field)
```

Step 3: Iterate over list and remove content

```
for record in root:
    for field in record:
        if field.tag == 'controlfield':
            if field.attrib['tag'] == "001":
                record.remove(field)
            if field.attrib['tag'] == "005":
                # Remove the data field from the record
                record.remove(field)
```

Step 4: Iterate over list and add content

```
# Iterate over all records in the collection
for record in root:
  new_980_field = ET.Element('datafield',
                    attrib={'tag': '980', 'ind1': ' ', 'ind2': ' '})
   new_subfield = ET.Element('subfield', attrib={'code': 'a'})
   new_subfield.text = 'BIB'
   new_980_field.append(new_subfield)
   record.append(new_980_field)
```

Step 4: Iterate over list and add content

```
for record in root:
    # Create a new data field element with attributes and
    save it as “new_980_field”.
    new_980_field = ET.Element('datafield',
                               attrib={'tag': '980', 'ind1': ' ', 'ind2': ' '})
     new_subfield = ET.Element('subfield', attrib={'code': 'a'})
     new_subfield.text = ‘BIB’
     new_980_field.append(new_subfield)
     record.append(new_980_field)
```

Step 4: Iterate over list and add content

```
for record in root:
    new_980_field = ET.Element('datafield',
                               attrib={'tag': '980', 'ind1': ' ', 'ind2': ' '})
    #Create a new subfield element with attribute and save
    it as "new_subfield".
    new_subfield = ET.Element('subfield', attrib={'code': 'a'})
    new_subfield.text = 'BIB'
    new_980_field.append(new_subfield)
    record.append(new_980_field)
```

Step 4: Iterate over list and add content

```
for record in root:
    new_980_field = ET.Element('datafield',
                               attrib={'tag': '980', 'ind1': ' ', 'ind2': ' '})
    new_subfield = ET.Element('subfield', attrib={'code': 'a'})
    # Add the string 'BIB' as text to the subfield
    new_subfield.text = 'BIB'
    new_980_field.append(new_subfield)
    record.append(new_980_field)
```

Step 4: Iterate over list and add content

```
for record in root:
    new_980_field = ET.Element('datafield',
                               attrib={'tag': '980', 'ind1': ' ', 'ind2': ' '})
    new_subfield = ET.Element('subfield', attrib={'code': 'a'})
    new_subfield.text = 'BIB'
    # Append subfield to data field.
    new_980_field.append(new_subfield)
    record.append(new_980_field)
```

Step 4: Iterate over list and add content

```
for record in root:
    new_980_field = ET.Element('datafield',
                               attrib={'tag': '980', 'ind1': ' ', 'ind2': ' '})
    new_subfield = ET.Element('subfield', attrib={'code': 'a'})
    new_subfield.text = 'BIB'
    new_980_field.append(new_subfield)
    # Append data field to record.
    record.append(new_980_field)
```

Step 5: Write data to new XMLfile

```
# Create and open a new XML file called
“springer_OA_output”
xmlfile = open('springer_OA_output.xml', 'w')
xmlfile.write(ET.tostring(root, pretty_print=True,
encoding='UTF-8'))
xmlfile.close()
```

Step 5: Write data to new XMLfile

```
xmlfile = open('springer_OA_output.xml', 'w')
# Convert root to a string, encode it to UTF-8 and make it look pretty!
Write the string to the "springer_OA_output.xml" file
xmlfile.write(ET.tostring(root, pretty_print=True, encoding='UTF-8'))
xmlfile.close()
```

Step 5: Write data to new XMLfile

```
xmlfile = open('springer_OA_output.xml', 'w')
xmlfile.write(ET.tostring(root, pretty_print=True,
encoding='UTF-8'))
# Close the file
xmlfile.close()
```

Run script!

Upload records

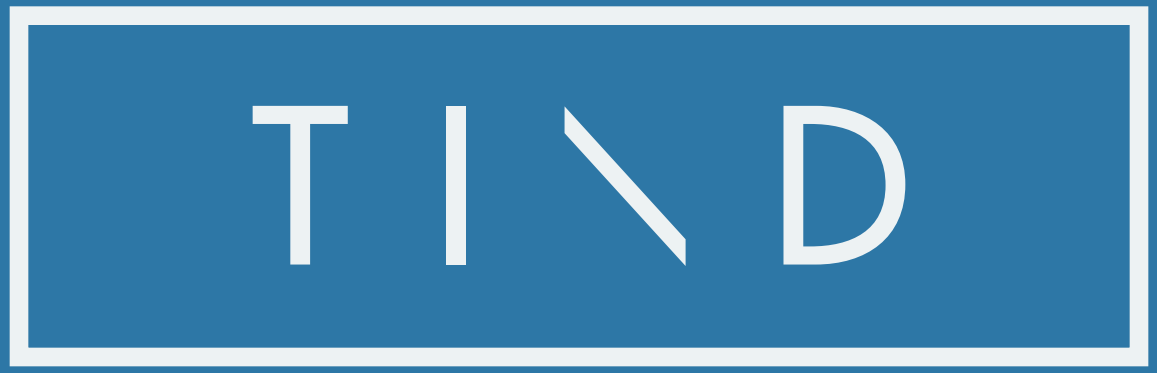
Other applications

- Search for specific data
- Find duplicates
- Create statistics
- More?

Documentation

Learning Python
https://www.codecademy.com/tracks/python

Lxml library
http://lxml.de/



www.tind.io