THE_UR_Global_Peers_Research_Performance_Profile

January 8, 2020

1 Install packages

```
In [3]: import tensorflow as tf
```

```
In [10]: from sklearn.cluster import KMeans
```

```
In [12]: import pandas as pd
```

```
In [13]: import numpy as np
```

```
In [14]: cd "C:\Users\jchen148\THE Rankings\Report to Jane"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane
```

2 Plot distribution of USA universities CitationCounts

```
In [5]: citation = pd.read_csv('Updated_THE_Ranked_Universites_CitationCounts_2014_2018.csv')

        citation.head()
```

```
Out[5]:           Country CountryCode     Uid           UniversityName  \
        0   United States         USA  508076        Harvard University
        1   United States         USA  508219       Stanford University
        2          Canada         CAN  501048     University of Toronto
        3   United States         USA  508094  Johns Hopkins University
        4  United Kingdom         GBR  315091      University of Oxford

                  metric  Citation2014  Citation2015  Citation2016  Citation2017  \
        0  CitationCount      837994.0      686576.0      529054.0      363995.0
        1  CitationCount      404346.0      363567.0      282005.0      194136.0
        2  CitationCount      360177.0      344355.0      254462.0      172125.0
        3  CitationCount      324631.0      289131.0      218379.0      147459.0
        4  CitationCount      355751.0      313129.0      238271.0      149907.0

           Citation2018
        0      172830.0
        1       95069.0
        2       86219.0
        3       77682.0
        4       75747.0
```

```
In [6]: totalcitation=citation['Citation2014']+citation['Citation2015']+citation['Citation2016
```

```
In [7]: citation['Total']=totalcitation
```

```
In [9]: citation.head()

        citation.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1002 entries, 0 to 1001
Data columns (total 11 columns):
Country             1002 non-null object
CountryCode         1002 non-null object
Uid                 1002 non-null int64
UniversityName      1002 non-null object
metric              1002 non-null object
Citation2014        998 non-null float64
Citation2015        995 non-null float64
Citation2016        998 non-null float64
Citation2017        1000 non-null float64
Citation2018        1001 non-null float64
Total               993 non-null float64
dtypes: float64(6), int64(1), object(4)
memory usage: 86.2+ KB
```

```
In [40]: changedtype=lambda x: int(x)
```

```
In [31]: #citation.fillna(0)

         for i in range(0,len(citation)):
             if citation.loc[i]['Citation2014'] is np.nan:
                 print("yes")
```

```
In [38]: citation['Citation2014'].isnull()

         citation=citation.fillna(0)
```

3 change all citationcount to int64

```
In [48]: citation['Citation2018']=citation['Citation2018'].apply(changedtype)
```

```
In [47]: citation['Citation2017']=citation['Citation2017'].apply(changedtype)
```

```
In [46]: citation['Citation2016']=citation['Citation2016'].apply(changedtype)
In [45]: citation['Citation2015']=citation['Citation2015'].apply(changedtype)
```

```
In [43]: citation['Citation2014']=citation['Citation2014'].apply(changedtype)
```

```
In [49]: citation.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1002 entries, 0 to 1001
Data columns (total 11 columns):
Country           1002 non-null object
CountryCode       1002 non-null object
Uid               1002 non-null int64
UniversityName    1002 non-null object
metric            1002 non-null object
Citation2014      1002 non-null int64
Citation2015      1002 non-null int64
Citation2016      1002 non-null int64
Citation2017      1002 non-null int64
Citation2018      1002 non-null int64
Total             1002 non-null float64
dtypes: float64(1), int64(6), object(4)
memory usage: 86.2+ KB
```

```
In [50]: citation.head()
```

```
Out[50]:           Country CountryCode     Uid            UniversityName  \
         0   United States         USA  508076        Harvard University
         1   United States         USA  508219       Stanford University
         2          Canada         CAN  501048     University of Toronto
         3   United States         USA  508094  Johns Hopkins University
         4  United Kingdom         GBR  315091      University of Oxford

                    metric  Citation2014  Citation2015  Citation2016  Citation2017  \
         0  CitationCount        837994        686576        529054        363995
         1  CitationCount        404346        363567        282005        194136
         2  CitationCount        360177        344355        254462        172125
         3  CitationCount        324631        289131        218379        147459
         4  CitationCount        355751        313129        238271        149907

            Citation2018      Total
         0        172830  2590449.0
         1         95069  1339123.0
         2         86219  1217338.0
         3         77682  1057282.0
         4         75747  1132805.0
```

```
In [66]: new=citation.sort_values(['CountryCode','Total'], ascending=False)
         new.head()
```

```
Out[66]:           Country CountryCode     Uid                    UniversityName  \
         334  South Africa         ZAF  115007          University of Pretoria
         307  South Africa         ZAF  115005        University of Johannesburg
         369  South Africa         ZAF  115001             North West University
         575  South Africa         ZAF  115010    University of the Western Cape
         586  South Africa         ZAF  115003  Tshwane University of Technology

                     metric  Citation2014  Citation2015  Citation2016  Citation2017  \
         334  CitationCount         20169         20294         18564         12800
         307  CitationCount         13732         17059         16450         12228
         369  CitationCount          9833          8025         14378         13220
         575  CitationCount          9538          8008          7081          5315
         586  CitationCount          3215          2665          2844          3173

              Citation2018    Total
         334          5918  77745.0
         307          6622  66091.0
         369          5225  50681.0
         575          2365  32307.0
         586          2271  14168.0
```

4 Filtered the universities in USA

```
In [70]: USdata=new[new['CountryCode']=='USA']
```

```
In [71]: USdata.head()
```

```
Out[71]:           Country CountryCode     Uid                         UniversityName  \
         0   United States         USA  508076                     Harvard University
         1   United States         USA  508219                    Stanford University
         3   United States         USA  508094               Johns Hopkins University
         6   United States         USA  508358               University of Washington
         11  United States         USA  508111  Massachusetts Institute of Technology

                    metric  Citation2014  Citation2015  Citation2016  Citation2017  \
         0   CitationCount        837994        686576        529054        363995
         1   CitationCount        404346        363567        282005        194136
         3   CitationCount        324631        289131        218379        147459
         6   CitationCount        314702        269985        218378        150820
         11  CitationCount        285399        241655        186864        121031

             Citation2018      Total
         0         172830  2590449.0
         1          95069  1339123.0
         3          77682  1057282.0
         6          70792  1024677.0
         11         57319   892268.0
```

5 Use seaborn

```
In [72]: import numpy as np
         import pandas as pd
         import seaborn as sns
         import matplotlib.pyplot as plt
         from scipy import stats
```

```
In [73]: sns.set(color_codes=True)
```

```
In [75]: USpartial=USdata.loc[:][['UniversityName','Total']]
```

```
In [80]: USpartial.head()

         USpartial2=USpartial.reset_index()

         USpartial2=USpartial2.iloc[:,1:]

         USpartial2.head()
```

```
Out[80]:                        UniversityName      Total
         0                  Harvard University  2590449.0
         1                 Stanford University  1339123.0
         2            Johns Hopkins University  1057282.0
         3            University of Washington  1024677.0
         4  Massachusetts Institute of Technology   892268.0
```

```
In [93]: target=USpartial2[USpartial2['UniversityName']=='University of Rochester']

         target.head()
```

```
Out[93]:              UniversityName     Total
         28  University of Rochester  254555.0
```

6 Change datatype to int64

```
In [95]: target.loc[:]['Total']=target['Total'].astype(int)
```

```
In [96]: target.head()
```

```
Out[96]:              UniversityName   Total
         28  University of Rochester  254555
```

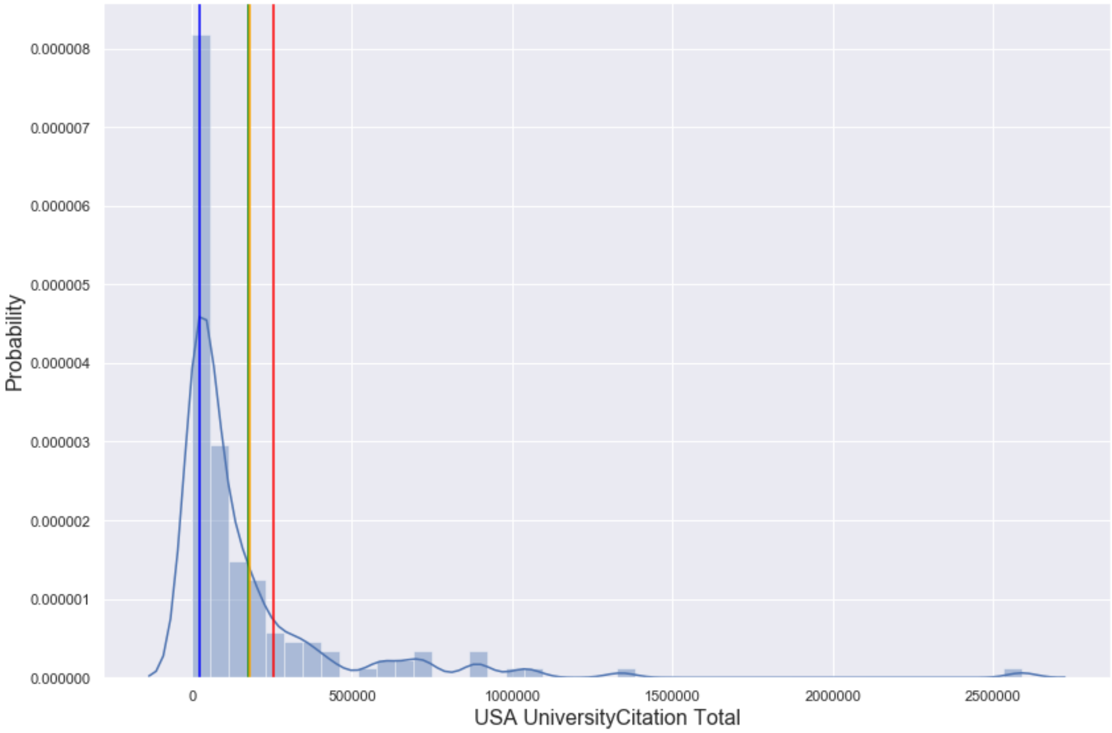
```
In [104]: USpartial2.head()

          USpartial2.set_index('UniversityName')

          USpartial2.loc[:]['Total']=USpartial2['Total'].astype(int)
```

```
In [113]: USpartial2=USpartial2.set_index('UniversityName')

In [114]: USpartial2.head()

Out[114]:                                            Total
          UniversityName
          Harvard University                     2590449.0
          Stanford University                    1339123.0
          Johns Hopkins University               1057282.0
          University of Washington               1024677.0
          Massachusetts Institute of Technology   892268.0

In [107]: target.head()

          target.set_index('UniversityName')

Out[107]:                          Total
          UniversityName
          University of Rochester  254555

In [109]: target=target.set_index('UniversityName')

In [110]: target.head()

Out[110]:                          Total
          UniversityName
          University of Rochester  254555

In [120]: len(USpartial2)

Out[120]: 153
```

7 The distribution of total citationcounts for USA universities

8 In total 153 universities, including U of R

```
In [156]: import pandas as pd
          fig, ax = plt.subplots(figsize=(12,8))
          x = pd.Series(USpartial2['Total'], name="CitationCount Total")
          ax = sns.distplot(x)

          ax.set_xlabel("USA UniversityCitation Total",fontsize=16)
          ax.set_ylabel("Probability",fontsize=16)
          plt.axvline(254555, color='red') # this is where U of R
          plt.axvline(np.mean(USpartial2['Total']), color='green') # this is the mean, 175882..
          plt.axvline(np.percentile(USpartial2['Total'], 25.0), color='blue') # Q1
          plt.axvline(np.percentile(USpartial2['Total'], 75.0), color='orange') # Q3 very clos
          #plt.legend()
          plt.tight_layout()
```



```
In [147]: import matplotlib
          from matplotlib import mlab
          import matplotlib.pyplot as plt
          import numpy as np
          import matplotlib.dates as mdates
          import matplotlib.pyplot as plt
```

```
In [152]: np.percentile(USpartial2['Total'], np.array([25.0,75.0]))
```

```
Out[152]: array([ 24316., 180027.])
```

```
In [122]: target
```

```
Out[122]:                            Total
          UniversityName
          University of Rochester  254555
```

```
In [136]: np.round(np.mean(USpartial2['Total']), 2)
```

```
Out[136]: 175882.56
```

9 The following is data-cleaning process

10 read in school list

```
In [ ]: school_list = open(r"C:\Users\jchen148\THE Rankings\Report to Jane\THE_School_List_OK.

        school_name=school_list.read()
```

```
In [ ]: import pandas as pd
        t = school_name

        data=[]

        for i in t.split("\n"):
            if i[:1].isdigit():
                data.append(" ".join(i.split(" ")[:20]))
                print(" ".join(i.split(" ")[:20]))

        data_want = pd.DataFrame(data, columns=['Scool Name'])


        data_want.to_csv("all_university_name.csv", index=False)  # all the university name
```

```
In [ ]: # cleaned all the ranks and leadning and trailing whitespace

        t = school_name

        uni_name = []

        for i in t.split("\n"):
            if i[:1].isdigit():
                uni_name.append(" ".join(i.split(" ")[-5:]))
                print(" ".join(i.split(" ")[-5:]))
                uni_name.append(" ".join(i.split(" ")[-5:]))
```

```
In [ ]: # remove trailing whitespace

        import re
        import string

        cleaned=[]

        for line in uni_name:
            line=str(line)
        #    print(line.strip(' \t\n\r'))
        #    print(line.rstrip(string.digits))
        #    print(re.sub('^\d+[\W_]+', '', line))
            want_data = re.sub('^\d+[\W_]+', '', line)
            print(want_data.strip())
            cleaned.append(want_data.strip())
```

```
In [ ]: # remove existing numbers

        import string
        import re

        want_3=[]

        for name in cleaned:
            print(name)
            print(re.sub('^\d+[\W_]+','',name))
            want_3.append(re.sub('^\d+[\W_]+','',name))
```

```
In [11]: want_3.append('University of Rochester')
```

```
In [15]: DF={}

         DF=pd.DataFrame({'UniName':want_3})
```

```
In [17]: DF=DF.drop_duplicates()
```

```
In [19]: DF=DF.reset_index()
```

```
In [21]: DF=DF.iloc[:,1]
```

```
In [25]: DF=pd.DataFrame(DF)
```

```
In [26]: DF.to_csv("UniNameList_OK.csv", index=False)
```

11 Use APIs

```
In [ ]: for line in want_3:
            url= "https://api.elsevier.com/metrics/institution/search?query=name("+line+")"
```

12 combine all the Uids retrieved from APIs

```
In [34]: filename='THE_CountryCode_Result_1202_{}'

         for i in range(1,14):
             print(filename.format(i))
```

```
THE_CountryCode_Result_1202_1
THE_CountryCode_Result_1202_2
THE_CountryCode_Result_1202_3
THE_CountryCode_Result_1202_4
THE_CountryCode_Result_1202_5
```

```
THE_CountryCode_Result_1202_6
THE_CountryCode_Result_1202_7
THE_CountryCode_Result_1202_8
THE_CountryCode_Result_1202_9
THE_CountryCode_Result_1202_10
THE_CountryCode_Result_1202_11
THE_CountryCode_Result_1202_12
THE_CountryCode_Result_1202_13
```

```
In [36]: cd "C:\Users\jchen148\THE Rankings\Report to Jane"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane
```

```
In [61]: filename='THE_CountryCode_Result_1202_{}.csv'

         chucks=[]

         for i in range(1,14):
         #    print(filename.format(i))
             chucks.append(pd.read_csv(filename.format(i)))

         data=pd.concat(chucks, ignore_index=True)

         data.head()
```

```
Out[61]:    Unnamed: 0                                    University Name   \
         0           0                               University of Oxford
         1           1  Jet Propulsion Laboratory, California Institut...
         2           2                 California Institute of Technology
         3           3                            University of Cambridge
         4           4                                Stanford University

            University id         Country Country Code
         0         315091  United Kingdom          GBR
         1         508092   United States          USA
         2         508021   United States          USA
         3         315068  United Kingdom          GBR
         4         508219   United States          USA
```

```
In [62]: del data['Unnamed: 0']
```

13 Use SciVal institution metrics API

```
In [42]: # https://api.elsevier.com/analytics/scival/institution/metrics
```

```
In [63]: data.head()
```

```
Out[63]:                                        University Name  University id  \
         0                                 University of Oxford         315091
         1  Jet Propulsion Laboratory, California Institut...         508092
         2                      California Institute of Technology         508021
         3                               University of Cambridge         315068
         4                                   Stanford University         508219

                   Country Country Code
         0  United Kingdom          GBR
         1   United States          USA
         2   United States          USA
         3  United Kingdom          GBR
         4   United States          USA
```

```
In [64]: for line in data['University id'][:2]:
             print(line)
```

```
315091
508092
```

```
In [85]: for line in data['University id'][:2]:
             print(line)
```

```
315091
508092
```

14 ScholarlyOutput

```
In [97]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data
```

```
In [145]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)

          inst_country=[]
          inst_cc=[]
          inst_id=[]
          inst_link=[]
          inst_name=[]
          metricType=[]
```

```
value2014=[]
value2015=[]
value2016=[]
value2017=[]
value2018=[]


for line in data['University id'][1000:]:
    url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=C
 #   print(url.format(line))
    resp = requests.get(url.format(line), headers={'Accept':'application/json',
                              'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
#        json.dump(resp.json(), jsonfile)
#    print(parsed)
#    data.update(a_dict)
    result=json.loads(parsed)
    if result['results'] is not None:
        if len(result['results'])>=1:
            if 'institution' in result['results'][0]:
#                if 'country' in result['results'][0]['institution']:
                inst_country.append(result['results'][0]['institution']['country'])
#            if 'countryCode' in result['results'][0]['institution']:
                inst_cc.append(result['results'][0]['institution']['countryCode'])
#            if 'id' in result['results'][0]['institution']:
                inst_id.append(result['results'][0]['institution']['id'])
#            if 'link' in result['results'][0]['institution']:
                inst_link.append(result['results'][0]['institution']['link'])
#            if 'name' in result['results'][0]['institution']:
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'valueByYear' in result['results'][0]['metrics'][0]:
                    if '2014' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2014.append(result['results'][0]['metrics'][0]['valueBy
                    if '2015' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2015.append(result['results'][0]['metrics'][0]['valueBy
                    if '2016' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2016.append(result['results'][0]['metrics'][0]['valueBy
                    if '2017' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2017.append(result['results'][0]['metrics'][0]['valueBy
                    if '2018' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2018.append(result['results'][0]['metrics'][0]['valueBy
s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
s7=pd.Series(value2014, name='2014')
s8=pd.Series(value2015, name='2015')
s9=pd.Series(value2016, name='2016')
s10=pd.Series(value2017, name='2017')
s11=pd.Series(value2018, name='2018')


DF=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11], axis=1)
DF.to_csv("THE_UNI_CitationCount_ALL_11.csv", index=False)
```

15 CitationCount, CitedPublications, FWCI, and PublicationinTopJournal Percentile

```
In [122]: # FWCI
```

```
In [133]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)

          inst_country=[]
          inst_cc=[]
          inst_id=[]
          inst_link=[]
          inst_name=[]
          metricType=[]
          value2014=[]
          value2015=[]
          value2016=[]
          value2017=[]
          value2018=[]
          percentage2014=[]
          percentage2015=[]
          percentage2016=[]
          percentage2017=[]
          percentage2018=[]
```

```
for line in data['University id'][1000:]:
    url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Fi
 #   print(url.format(line))
    resp = requests.get(url.format(line), headers={'Accept':'application/json',
                             'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
#        json.dump(resp.json(), jsonfile)
#    print(parsed)
#    data.update(a_dict)
    result=json.loads(parsed)
    if result['results'] is not None:
        if len(result['results'])>=1:
            if 'institution' in result['results'][0]:
#                if 'country' in result['results'][0]['institution']:
                inst_country.append(result['results'][0]['institution']['country'])
#            if 'countryCode' in result['results'][0]['institution']:
                inst_cc.append(result['results'][0]['institution']['countryCode'])
#            if 'id' in result['results'][0]['institution']:
                inst_id.append(result['results'][0]['institution']['id'])
#            if 'link' in result['results'][0]['institution']:
                inst_link.append(result['results'][0]['institution']['link'])
#            if 'name' in result['results'][0]['institution']:
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'valueByYear' in result['results'][0]['metrics'][0]:
                    if '2014' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2014.append(result['results'][0]['metrics'][0]['valueBy
                    if '2015' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2015.append(result['results'][0]['metrics'][0]['valueBy
                    if '2016' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2016.append(result['results'][0]['metrics'][0]['valueBy
                    if '2017' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2017.append(result['results'][0]['metrics'][0]['valueBy
                    if '2018' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2018.append(result['results'][0]['metrics'][0]['valueBy
                if 'percentageByYear' in result['results'][0]['metrics'][0]:
                    if '2014' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2014.append(result['results'][0]['metrics'][0]['pe
                    if '2015' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2015.append(result['results'][0]['metrics'][0]['pe
                    if '2016' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2016.append(result['results'][0]['metrics'][0]['pe
                    if '2017' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2017.append(result['results'][0]['metrics'][0]['pe
                    if '2018' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2018.append(result['results'][0]['metrics'][0]['pe
                else:
                    percentage2014.append('')
                    percentage2015.append('')
                    percentage2016.append('')
                    percentage2017.append('')
                    percentage2018.append('')


s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
s7=pd.Series(value2014, name='2014')
s8=pd.Series(value2015, name='2015')
s9=pd.Series(value2016, name='2016')
s10=pd.Series(value2017, name='2017')
s11=pd.Series(value2018, name='2018')
#s12=pd.Series(percentage2014, name='percent2014')
#s13=pd.Series(percentage2015, name='percent2015')
#s14=pd.Series(percentage2016, name='percent2016')
#s15=pd.Series(percentage2017, name='percent2017')
#s16=pd.Series(percentage2018, name='percent2018')


DF=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11], axis=1)
DF.to_csv("THE_UNI_FWCI_11.csv", index=False)
```

```
In [134]: # CitationCount
```

```
In [133]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)

          inst_country=[]
          inst_cc=[]
          inst_id=[]
          inst_link=[]
          inst_name=[]
          metricType=[]
```

```
value2014=[]
value2015=[]
value2016=[]
value2017=[]
value2018=[]
percentage2014=[]
percentage2015=[]
percentage2016=[]
percentage2017=[]
percentage2018=[]


for line in data['University id'][1000:]:
    url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=F
 #   print(url.format(line))
    resp = requests.get(url.format(line), headers={'Accept':'application/json',
                             'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
#        json.dump(resp.json(), jsonfile)
#    print(parsed)
#    data.update(a_dict)
    result=json.loads(parsed)
    if result['results'] is not None:
        if len(result['results'])>=1:
            if 'institution' in result['results'][0]:
#                if 'country' in result['results'][0]['institution']:
                inst_country.append(result['results'][0]['institution']['country'])
#            if 'countryCode' in result['results'][0]['institution']:
                inst_cc.append(result['results'][0]['institution']['countryCode'])
#            if 'id' in result['results'][0]['institution']:
                inst_id.append(result['results'][0]['institution']['id'])
#            if 'link' in result['results'][0]['institution']:
                inst_link.append(result['results'][0]['institution']['link'])
#            if 'name' in result['results'][0]['institution']:
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'valueByYear' in result['results'][0]['metrics'][0]:
                    if '2014' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2014.append(result['results'][0]['metrics'][0]['valueBy
                    if '2015' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2015.append(result['results'][0]['metrics'][0]['valueBy
                    if '2016' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2016.append(result['results'][0]['metrics'][0]['valueBy
                    if '2017' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2017.append(result['results'][0]['metrics'][0]['valueBy
                    if '2018' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2018.append(result['results'][0]['metrics'][0]['valueBy
                if 'percentageByYear' in result['results'][0]['metrics'][0]:
                    if '2014' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2014.append(result['results'][0]['metrics'][0]['pe
                    if '2015' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2015.append(result['results'][0]['metrics'][0]['pe
                    if '2016' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2016.append(result['results'][0]['metrics'][0]['pe
                    if '2017' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2017.append(result['results'][0]['metrics'][0]['pe
                    if '2018' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2018.append(result['results'][0]['metrics'][0]['pe
                else:
                    percentage2014.append('')
                    percentage2015.append('')
                    percentage2016.append('')
                    percentage2017.append('')
                    percentage2018.append('')


s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
s7=pd.Series(value2014, name='2014')
s8=pd.Series(value2015, name='2015')
s9=pd.Series(value2016, name='2016')
s10=pd.Series(value2017, name='2017')
s11=pd.Series(value2018, name='2018')
#s12=pd.Series(percentage2014, name='percent2014')
#s13=pd.Series(percentage2015, name='percent2015')
#s14=pd.Series(percentage2016, name='percent2016')
#s15=pd.Series(percentage2017, name='percent2017')
#s16=pd.Series(percentage2018, name='percent2018')


DF=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11], axis=1)
DF.to_csv("THE_UNI_FWCI_11.csv", index=False)
```

```
In [146]: # CitedPublications
```

```
In [159]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)

          inst_country=[]
          inst_cc=[]
          inst_id=[]
          inst_link=[]
          inst_name=[]
          metricType=[]
          value2014=[]
          value2015=[]
          value2016=[]
          value2017=[]
          value2018=[]
          percentage2014=[]
          percentage2015=[]
          percentage2016=[]
          percentage2017=[]
          percentage2018=[]


          for line in data['University id'][1000:]:
              url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=C
           #   print(url.format(line))
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                       'X-ELS-APIKey': "d3794058e2b24417b5dfd0ef8990e2dc"})
              parsed=json.dumps(resp.json(),
                           sort_keys=True,
                           indent=4, separators=(',', ': '))
          #    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
          #        json.dump(resp.json(), jsonfile)
          #    print(parsed)
          #    data.update(a_dict)
              result=json.loads(parsed)
              if 'results' in result:
                  if len(result['results'])>=1:
                      if 'institution' in result['results'][0]:
          #                if 'country' in result['results'][0]['institution']:
                          inst_country.append(result['results'][0]['institution']['country'])
          #            if 'countryCode' in result['results'][0]['institution']:
                          inst_cc.append(result['results'][0]['institution']['countryCode'])
          #            if 'id' in result['results'][0]['institution']:
                          inst_id.append(result['results'][0]['institution']['id'])
          #            if 'link' in result['results'][0]['institution']:
                          inst_link.append(result['results'][0]['institution']['link'])
          #            if 'name' in result['results'][0]['institution']:
```

```
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'valueByYear' in result['results'][0]['metrics'][0]:
                    if '2014' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2014.append(result['results'][0]['metrics'][0]['valueBy
                    if '2015' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2015.append(result['results'][0]['metrics'][0]['valueBy
                    if '2016' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2016.append(result['results'][0]['metrics'][0]['valueBy
                    if '2017' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2017.append(result['results'][0]['metrics'][0]['valueBy
                    if '2018' in result['results'][0]['metrics'][0]['valueByYear']:
                        value2018.append(result['results'][0]['metrics'][0]['valueBy
                if 'percentageByYear' in result['results'][0]['metrics'][0]:
                    if '2014' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2014.append(result['results'][0]['metrics'][0]['pe
                    if '2015' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2015.append(result['results'][0]['metrics'][0]['pe
                    if '2016' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2016.append(result['results'][0]['metrics'][0]['pe
                    if '2017' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2017.append(result['results'][0]['metrics'][0]['pe
                    if '2018' in result['results'][0]['metrics'][0]['percentageByYea
                        percentage2018.append(result['results'][0]['metrics'][0]['pe
                else:
                    percentage2014.append('')
                    percentage2015.append('')
                    percentage2016.append('')
                    percentage2017.append('')
                    percentage2018.append('')


s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
s7=pd.Series(value2014, name='2014')
s8=pd.Series(value2015, name='2015')
s9=pd.Series(value2016, name='2016')
s10=pd.Series(value2017, name='2017')
s11=pd.Series(value2018, name='2018')
s12=pd.Series(percentage2014, name='percent2014')
s13=pd.Series(percentage2015, name='percent2015')
```

```
         s14=pd.Series(percentage2016, name='percent2016')
         s15=pd.Series(percentage2017, name='percent2017')
         s16=pd.Series(percentage2018, name='percent2018')


         DF=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11,s12,s13,s14,s15,s16], axis=1)
         DF.to_csv("THE_UNI_CitedPublications_11.csv", index=False)
```

```
In [160]: #PublicationsInTopJournalPercentiles
```

```
In [186]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)

          inst_country=[]
          inst_cc=[]
          inst_id=[]
          inst_link=[]
          inst_name=[]
          metricType=[]
          threshold=[]
          t1_value2014=[]
          t1_value2015=[]
          t1_value2016=[]
          t1_value2017=[]
          t1_value2018=[]
          t1_percentage2014=[]
          t1_percentage2015=[]
          t1_percentage2016=[]
          t1_percentage2017=[]
          t1_percentage2018=[]
          t5_value2014=[]
          t5_value2015=[]
          t5_value2016=[]
          t5_value2017=[]
          t5_value2018=[]
          t5_percentage2014=[]
          t5_percentage2015=[]
          t5_percentage2016=[]
          t5_percentage2017=[]
          t5_percentage2018=[]
          t10_value2014=[]
          t10_value2015=[]
          t10_value2016=[]
          t10_value2017=[]
```

```
t10_value2018=[]
t10_percentage2014=[]
t10_percentage2015=[]
t10_percentage2016=[]
t10_percentage2017=[]
t10_percentage2018=[]
t25_value2014=[]
t25_value2015=[]
t25_value2016=[]
t25_value2017=[]
t25_value2018=[]
t25_percentage2014=[]
t25_percentage2015=[]
t25_percentage2016=[]
t25_percentage2017=[]
t25_percentage2018=[]



for line in data['University id'][:2]:
    url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Pu
 #   print(url.format(line))
    resp = requests.get(url.format(line), headers={'Accept':'application/json',
                              'X-ELS-APIKey': "d3794058e2b24417b5dfd0ef8990e2dc"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
#        json.dump(resp.json(), jsonfile)
#    print(parsed)
#    data.update(a_dict)
    result=json.loads(parsed)
    if 'results' in result:
        if len(result['results'])>=1:
            if 'institution' in result['results'][0]:
#                if 'country' in result['results'][0]['institution']:
                inst_country.append(result['results'][0]['institution']['country'])
#            if 'countryCode' in result['results'][0]['institution']:
                inst_cc.append(result['results'][0]['institution']['countryCode'])
#            if 'id' in result['results'][0]['institution']:
                inst_id.append(result['results'][0]['institution']['id'])
#            if 'link' in result['results'][0]['institution']:
                inst_link.append(result['results'][0]['institution']['link'])
#            if 'name' in result['results'][0]['institution']:
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'values' in result['results'][0]['metrics'][0]:
                    if 'threshold' in result['results'][0]['metrics'][0]['values']:
                        threshold.append(result['results'][0]['metrics'][0]['values']
                    if 'valueByYear' in result['results'][0]['metrics'][0]['values']
                        if '2014' in result['results'][0]['metrics'][0]['values']['va
                            t1_value2014.append(result['results'][0]['metrics'][0]['v
                        if '2015' in result['results'][0]['metrics'][0]['values']['va
                            t1_value2015.append(result['results'][0]['metrics'][0]['v
                        if '2016' in result['results'][0]['metrics'][0]['values']['va
                            t1_value2016.append(result['results'][0]['metrics'][0]['v
                        if '2017' in result['results'][0]['metrics'][0]['values']['va
                            t1_value2017.append(result['results'][0]['metrics'][0]['v
                        if '2018' in result['results'][0]['metrics'][0]['values']['va
                            t1_value2018.append(result['results'][0]['metrics'][0]['v
                    if 'percentageByYear' in result['results'][0]['metrics'][0]['valu
                        if '2014' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2014.append(result['results'][0]['metrics']
                        if '2015' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2015.append(result['results'][0]['metrics']
                        if '2016' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2016.append(result['results'][0]['metrics']
                        if '2017' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2017.append(result['results'][0]['metrics']
                        if '2018' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2018.append(result['results'][0]['metrics']
#                    else:
#                        t1_value2014.append('')
#                        t1_value2015.append('')
#                        t1_value2016.append('')
#                        t1_value2017.append('')
#                        t1_value2018.append('')
#                        t1_percentage2014.append('')
#                        t1_percentage2015.append('')
#                        t1_percentage2016.append('')
#                        t1_percentage2017.append('')
#                        t1_percentage2018.append('')

s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
s7=pd.Series(threshold, name='threshold')
s8=pd.Series(t1_value2014, name='2014')
s9=pd.Series(t1_value2015, name='2015')
s10=pd.Series(t1_value2016, name='2016')
```

```
         s11=pd.Series(t1_value2017, name='2017')
         s12=pd.Series(t1_value2018, name='2018')
         s13=pd.Series(t1_percentage2014, name='percent2014')
         s14=pd.Series(t1_percentage2015, name='percent2015')
         s15=pd.Series(t1_percentage2016, name='percent2016')
         s16=pd.Series(t1_percentage2017, name='percent2017')
         s17=pd.Series(t1_percentage2018, name='percent2018')


         DF=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11,s12,s13,s14,s15,s16, s17], axis=1)
         DF.to_csv("THE_UNI_PublicationsInTopJournalPercentiles_TEST_1.csv", index=False)
```

```
In [206]: metricType=[]
          threshold=[]
          value2014=[]
          value2015=[]
          value2016=[]
          value2017=[]
          value2018=[]
          percent2014=[]
          percent2015=[]
          percent2016=[]
          percent2017=[]
          percent2018=[]



          for line in data['University id'][:2]:
              url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Pu
           #   print(url.format(line))
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                          'X-ELS-APIKey': "d3794058e2b24417b5dfd0ef8990e2dc"})
              parsed=json.dumps(resp.json(),
                           sort_keys=True,
                           indent=4, separators=(',', ': '))
          #    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
          #        json.dump(resp.json(), jsonfile)
          #    print(parsed)
          #    data.update(a_dict)
              result=json.loads(parsed)
          print(result['results'][0]['metrics'][0]['values'][3]['percentageByYear'])
```

```
{'2014': 67.55675, '2015': 73.333336, '2016': 67.42509, '2017': 66.53675, '2018': 64.18532}
```

```
In [214]: import requests
          import json
          import pandas as pd
          import numpy as np
```

```
from time import sleep
sleep(2)

inst_country=[]
inst_cc=[]
inst_id=[]
inst_link=[]
inst_name=[]
metricType=[]
threshold=[]
t1_value2014=[]
t1_value2015=[]
t1_value2016=[]
t1_value2017=[]
t1_value2018=[]
t1_percentage2014=[]
t1_percentage2015=[]
t1_percentage2016=[]
t1_percentage2017=[]
t1_percentage2018=[]
t5_value2014=[]
t5_value2015=[]
t5_value2016=[]
t5_value2017=[]
t5_value2018=[]
t5_percentage2014=[]
t5_percentage2015=[]
t5_percentage2016=[]
t5_percentage2017=[]
t5_percentage2018=[]
t10_value2014=[]
t10_value2015=[]
t10_value2016=[]
t10_value2017=[]
t10_value2018=[]
t10_percentage2014=[]
t10_percentage2015=[]
t10_percentage2016=[]
t10_percentage2017=[]
t10_percentage2018=[]
t25_value2014=[]
t25_value2015=[]
t25_value2016=[]
t25_value2017=[]
t25_value2018=[]
t25_percentage2014=[]
t25_percentage2015=[]
t25_percentage2016=[]
```

```
t25_percentage2017=[]
t25_percentage2018=[]



for line in data['University id'][50:75]:
    url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Pu
 #   print(url.format(line))
    resp = requests.get(url.format(line), headers={'Accept':'application/json',
                             'X-ELS-APIKey': "d3794058e2b24417b5dfd0ef8990e2dc"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
#        json.dump(resp.json(), jsonfile)
#    print(parsed)
#    data.update(a_dict)
    result=json.loads(parsed)
    if 'results' in result:
        if len(result['results'])>=1:
            if 'institution' in result['results'][0]:
#                if 'country' in result['results'][0]['institution']:
                inst_country.append(result['results'][0]['institution']['country'])
#            if 'countryCode' in result['results'][0]['institution']:
                inst_cc.append(result['results'][0]['institution']['countryCode'])
#            if 'id' in result['results'][0]['institution']:
                inst_id.append(result['results'][0]['institution']['id'])
#            if 'link' in result['results'][0]['institution']:
                inst_link.append(result['results'][0]['institution']['link'])
#            if 'name' in result['results'][0]['institution']:
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'values' in result['results'][0]['metrics'][0]:
#                    print(result['results'][0]['metrics'][0]['values'][1]['threshol
                    for i in range(0, len(result['results'][0]['metrics'][0]['values
                        threshold.append(result['results'][0]['metrics'][0]['values']
                        if 'valueByYear' in result['results'][0]['metrics'][0]['valu
#                         if i ==0:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t1_value2014.append(result['results'][0]['metrics'][
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t1_value2015.append(result['results'][0]['metrics'][
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t1_value2016.append(result['results'][0]['metrics'][
                            if '2017' in result['results'][0]['metrics'][0]['values']
```

```
                                t1_value2017.append(result['results'][0]['metrics'][
                            if '2018' in result['results'][0]['metrics'][0]['values'
                                t1_value2018.append(result['results'][0]['metrics'][
#                        if i ==1:
                            if '2014' in result['results'][0]['metrics'][0]['values'
                                t5_value2014.append(result['results'][0]['metrics'][
                            if '2015' in result['results'][0]['metrics'][0]['values'
                                t5_value2015.append(result['results'][0]['metrics'][
                            if '2016' in result['results'][0]['metrics'][0]['values'
                                t5_value2016.append(result['results'][0]['metrics'][
                            if '2017' in result['results'][0]['metrics'][0]['values'
                                t5_value2017.append(result['results'][0]['metrics'][
                            if '2018' in result['results'][0]['metrics'][0]['values'
                                t5_value2018.append(result['results'][0]['metrics'][

#                        if i ==2:
                            if '2014' in result['results'][0]['metrics'][0]['values'
                                t10_value2014.append(result['results'][0]['metrics']
                            if '2015' in result['results'][0]['metrics'][0]['values'
                                t10_value2015.append(result['results'][0]['metrics']
                            if '2016' in result['results'][0]['metrics'][0]['values'
                                t10_value2016.append(result['results'][0]['metrics']
                            if '2017' in result['results'][0]['metrics'][0]['values'
                                t10_value2017.append(result['results'][0]['metrics']
                            if '2018' in result['results'][0]['metrics'][0]['values'
                                t10_value2018.append(result['results'][0]['metrics']

#                        if i ==3:
                            if '2014' in result['results'][0]['metrics'][0]['values'
                                t25_value2014.append(result['results'][0]['metrics']
                            if '2015' in result['results'][0]['metrics'][0]['values'
                                t25_value2015.append(result['results'][0]['metrics']
                            if '2016' in result['results'][0]['metrics'][0]['values'
                                t25_value2016.append(result['results'][0]['metrics']
                            if '2017' in result['results'][0]['metrics'][0]['values'
                                t25_value2017.append(result['results'][0]['metrics']
                            if '2018' in result['results'][0]['metrics'][0]['values'
                                t25_value2018.append(result['results'][0]['metrics']

                        if 'percentageByYear' in result['results'][0]['metrics'][0][
#                        if i ==0:
                            if '2014' in result['results'][0]['metrics'][0]['values'
                                t1_percentage2014.append(result['results'][0]['metri
                            if '2015' in result['results'][0]['metrics'][0]['values'
                                t1_percentage2015.append(result['results'][0]['metri
                            if '2016' in result['results'][0]['metrics'][0]['values'
                                t1_percentage2016.append(result['results'][0]['metri
                            if '2017' in result['results'][0]['metrics'][0]['values'
```

```
                                t1_percentage2017.append(result['results'][0]['metric
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t1_percentage2018.append(result['results'][0]['metric

#                        if i ==1:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2014.append(result['results'][0]['metric
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2015.append(result['results'][0]['metric
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2016.append(result['results'][0]['metric
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2017.append(result['results'][0]['metric
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2018.append(result['results'][0]['metric

#                        if i ==2:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2014.append(result['results'][0]['metri
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2015.append(result['results'][0]['metri
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2016.append(result['results'][0]['metri
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2017.append(result['results'][0]['metri
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2018.append(result['results'][0]['metri

#                        if i ==3:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2014.append(result['results'][0]['metri
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2015.append(result['results'][0]['metri
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2016.append(result['results'][0]['metri
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2017.append(result['results'][0]['metri
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2018.append(result['results'][0]['metri
#                    else:
#                        t1_value2014.append('')
#                        t1_value2015.append('')
#                        t1_value2016.append('')
#                        t1_value2017.append('')
#                        t1_value2018.append('')
#                        t1_percentage2014.append('')
#                        t1_percentage2015.append('')
#                        t1_percentage2016.append('')
#                        t1_percentage2017.append('')
#                        t1_percentage2018.append('')

#                    else:
#                        t1_value2014.append('')
#                        t1_value2015.append('')
#                        t1_value2016.append('')
#                        t1_value2017.append('')
#                        t1_value2018.append('')
#                        t1_percentage2014.append('')
#                        t1_percentage2015.append('')
#                        t1_percentage2016.append('')
#                        t1_percentage2017.append('')
#                        t1_percentage2018.append('')

#                    if 'threshold' in result['results'][0]['metrics'][0]['values']:
#                        threshold.append(result['results'][0]['metrics'][0]['values


s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
s7=pd.Series(threshold, name='threshold')
s8=pd.Series(t1_value2014, name='t1_2014')
s9=pd.Series(t1_value2015, name='t1_2015')
s10=pd.Series(t1_value2016, name='t1_2016')
s11=pd.Series(t1_value2017, name='t1_2017')
s12=pd.Series(t1_value2018, name='t1_2018')
s13=pd.Series(t1_percentage2014, name='t1_percent2014')
s14=pd.Series(t1_percentage2015, name='t1_percent2015')
s15=pd.Series(t1_percentage2016, name='t1_percent2016')
s16=pd.Series(t1_percentage2017, name='t1_percent2017')
s17=pd.Series(t1_percentage2018, name='t1_percent2018')
s18=pd.Series(t5_value2014, name='t5_2014')
s19=pd.Series(t5_value2015, name='t5_2015')
s20=pd.Series(t5_value2016, name='t5_2016')
s21=pd.Series(t5_value2017, name='t5_2017')
s22=pd.Series(t5_value2018, name='t5_2018')
s23=pd.Series(t5_percentage2014, name='t5_percent2014')
s24=pd.Series(t5_percentage2015, name='t5_percent2015')
s25=pd.Series(t5_percentage2016, name='t5_percent2016')
s26=pd.Series(t5_percentage2017, name='t5_percent2017')
s27=pd.Series(t5_percentage2018, name='t5_percent2018')
s28=pd.Series(t10_value2014, name='t10_2014')
s29=pd.Series(t10_value2015, name='t10_2015')
```

```
s30=pd.Series(t10_value2016, name='t10_2016')
s31=pd.Series(t10_value2017, name='t10_2017')
s32=pd.Series(t10_value2018, name='t10_2018')
s33=pd.Series(t10_percentage2014, name='t10_percent2014')
s34=pd.Series(t10_percentage2015, name='t10_percent2015')
s35=pd.Series(t10_percentage2016, name='t10_percent2016')
s36=pd.Series(t10_percentage2017, name='t10_percent2017')
s37=pd.Series(t10_percentage2018, name='t10_percent2018')
s38=pd.Series(t25_value2014, name='t25_2014')
s39=pd.Series(t25_value2015, name='t25_2015')
s40=pd.Series(t25_value2016, name='t25_2016')
s41=pd.Series(t25_value2017, name='t25_2017')
s42=pd.Series(t25_value2018, name='t25_2018')
s43=pd.Series(t25_percentage2014, name='t25_percent2014')
s44=pd.Series(t25_percentage2015, name='t25_percent2015')
s45=pd.Series(t25_percentage2016, name='t25_percent2016')
s46=pd.Series(t25_percentage2017, name='t25_percent2017')
s47=pd.Series(t25_percentage2018, name='t25_percent2018')


DF=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11,s12,s13,s14,s15,s16, s17,s18,s19,s20
             s28,s29,s30,s31,s32,s33,s34,s35,s36,s37,s38,s39,s40, s41,s42,s43,s44,s45


DF.to_csv("THE_UNI_PublicationsInTopJournalPercentiles_ALL_3.csv", index=False)  # O



#print(threshold)
```

```
In [233]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)

          inst_country=[]
          inst_cc=[]
          inst_id=[]
          inst_link=[]
          inst_name=[]
          metricType=[]
          #threshold=[]
          t1_value2014=[]
          t1_value2015=[]
          t1_value2016=[]
          t1_value2017=[]
```

```
t1_value2018=[]
t1_percentage2014=[]
t1_percentage2015=[]
t1_percentage2016=[]
t1_percentage2017=[]
t1_percentage2018=[]
t5_value2014=[]
t5_value2015=[]
t5_value2016=[]
t5_value2017=[]
t5_value2018=[]
t5_percentage2014=[]
t5_percentage2015=[]
t5_percentage2016=[]
t5_percentage2017=[]
t5_percentage2018=[]
t10_value2014=[]
t10_value2015=[]
t10_value2016=[]
t10_value2017=[]
t10_value2018=[]
t10_percentage2014=[]
t10_percentage2015=[]
t10_percentage2016=[]
t10_percentage2017=[]
t10_percentage2018=[]
t25_value2014=[]
t25_value2015=[]
t25_value2016=[]
t25_value2017=[]
t25_value2018=[]
t25_percentage2014=[]
t25_percentage2015=[]
t25_percentage2016=[]
t25_percentage2017=[]
t25_percentage2018=[]



for line in data['University id'][1000:]:
    url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Pu
 #   print(url.format(line))
    resp = requests.get(url.format(line), headers={'Accept':'application/json',
                             'X-ELS-APIKey': "d3794058e2b24417b5dfd0ef8990e2dc"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
```

```
#        json.dump(resp.json(), jsonfile)
#    print(parsed)
#    data.update(a_dict)
    result=json.loads(parsed)
    if 'results' in result:
        if len(result['results'])>=1:
            if 'institution' in result['results'][0]:
#                if 'country' in result['results'][0]['institution']:
                inst_country.append(result['results'][0]['institution']['country'])
#            if 'countryCode' in result['results'][0]['institution']:
                inst_cc.append(result['results'][0]['institution']['countryCode'])
#            if 'id' in result['results'][0]['institution']:
                inst_id.append(result['results'][0]['institution']['id'])
#            if 'link' in result['results'][0]['institution']:
                inst_link.append(result['results'][0]['institution']['link'])
#            if 'name' in result['results'][0]['institution']:
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'values' in result['results'][0]['metrics'][0]:
#                    print(result['results'][0]['metrics'][0]['values'][1]['threshol
#                    for i in range(0, len(result['results'][0]['metrics'][0]['value
#                        threshold.append(result['results'][0]['metrics'][0]['values
                    if 'valueByYear' in result['results'][0]['metrics'][0]['values']
#                        if i ==0:
                        if '2014' in result['results'][0]['metrics'][0]['values'][0]
                            t1_value2014.append(result['results'][0]['metrics'][0]['v
                        if '2015' in result['results'][0]['metrics'][0]['values'][0]
                            t1_value2015.append(result['results'][0]['metrics'][0]['v
                        if '2016' in result['results'][0]['metrics'][0]['values'][0]
                            t1_value2016.append(result['results'][0]['metrics'][0]['v
                        if '2017' in result['results'][0]['metrics'][0]['values'][0]
                            t1_value2017.append(result['results'][0]['metrics'][0]['v
                        if '2018' in result['results'][0]['metrics'][0]['values'][0]
                            t1_value2018.append(result['results'][0]['metrics'][0]['v
#                        if i ==1:
                    if 'valueByYear' in result['results'][0]['metrics'][0]['values']
                        if '2014' in result['results'][0]['metrics'][0]['values'][1]
                            t5_value2014.append(result['results'][0]['metrics'][0]['v
                        if '2015' in result['results'][0]['metrics'][0]['values'][1]
                            t5_value2015.append(result['results'][0]['metrics'][0]['v
                        if '2016' in result['results'][0]['metrics'][0]['values'][1]
                            t5_value2016.append(result['results'][0]['metrics'][0]['v
                        if '2017' in result['results'][0]['metrics'][0]['values'][1]
                            t5_value2017.append(result['results'][0]['metrics'][0]['v
                        if '2018' in result['results'][0]['metrics'][0]['values'][1]
```

```
                            t5_value2018.append(result['results'][0]['metrics'][0]['

#                        if i ==2:
                    if 'valueByYear' in result['results'][0]['metrics'][0]['values']
                        if '2014' in result['results'][0]['metrics'][0]['values'][2]
                            t10_value2014.append(result['results'][0]['metrics'][0][
                        if '2015' in result['results'][0]['metrics'][0]['values'][2]
                            t10_value2015.append(result['results'][0]['metrics'][0][
                        if '2016' in result['results'][0]['metrics'][0]['values'][2]
                            t10_value2016.append(result['results'][0]['metrics'][0][
                        if '2017' in result['results'][0]['metrics'][0]['values'][2]
                            t10_value2017.append(result['results'][0]['metrics'][0][
                        if '2018' in result['results'][0]['metrics'][0]['values'][2]
                            t10_value2018.append(result['results'][0]['metrics'][0][

#                        if i ==3:
                    if 'valueByYear' in result['results'][0]['metrics'][0]['values']
                        if '2014' in result['results'][0]['metrics'][0]['values'][3]
                            t25_value2014.append(result['results'][0]['metrics'][0][
                        if '2015' in result['results'][0]['metrics'][0]['values'][3]
                            t25_value2015.append(result['results'][0]['metrics'][0][
                        if '2016' in result['results'][0]['metrics'][0]['values'][3]
                            t25_value2016.append(result['results'][0]['metrics'][0][
                        if '2017' in result['results'][0]['metrics'][0]['values'][3]
                            t25_value2017.append(result['results'][0]['metrics'][0][
                        if '2018' in result['results'][0]['metrics'][0]['values'][3]
                            t25_value2018.append(result['results'][0]['metrics'][0][

                    if 'percentageByYear' in result['results'][0]['metrics'][0]['valu
#                        if i ==0:
                        if '2014' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2014.append(result['results'][0]['metrics']
                        if '2015' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2015.append(result['results'][0]['metrics']
                        if '2016' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2016.append(result['results'][0]['metrics']
                        if '2017' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2017.append(result['results'][0]['metrics']
                        if '2018' in result['results'][0]['metrics'][0]['values'][0]
                            t1_percentage2018.append(result['results'][0]['metrics']

#                        if i ==1:
                    if 'percentageByYear' in result['results'][0]['metrics'][0]['valu
                        if '2014' in result['results'][0]['metrics'][0]['values'][1]
                            t5_percentage2014.append(result['results'][0]['metrics']
                        if '2015' in result['results'][0]['metrics'][0]['values'][1]
                            t5_percentage2015.append(result['results'][0]['metrics']
                        if '2016' in result['results'][0]['metrics'][0]['values'][1]
```

```
                            t5_percentage2016.append(result['results'][0]['metrics']
                        if '2017' in result['results'][0]['metrics'][0]['values'][1]
                            t5_percentage2017.append(result['results'][0]['metrics']
                        if '2018' in result['results'][0]['metrics'][0]['values'][1]
                            t5_percentage2018.append(result['results'][0]['metrics']

#                        if i ==2:
                    if 'percentageByYear' in result['results'][0]['metrics'][0]['valu
                        if '2014' in result['results'][0]['metrics'][0]['values'][2]
                            t10_percentage2014.append(result['results'][0]['metrics']
                        if '2015' in result['results'][0]['metrics'][0]['values'][2]
                            t10_percentage2015.append(result['results'][0]['metrics']
                        if '2016' in result['results'][0]['metrics'][0]['values'][2]
                            t10_percentage2016.append(result['results'][0]['metrics']
                        if '2017' in result['results'][0]['metrics'][0]['values'][2]
                            t10_percentage2017.append(result['results'][0]['metrics']
                        if '2018' in result['results'][0]['metrics'][0]['values'][2]
                            t10_percentage2018.append(result['results'][0]['metrics']

#                        if i ==3:
                    if 'percentageByYear' in result['results'][0]['metrics'][0]['valu
                        if '2014' in result['results'][0]['metrics'][0]['values'][3]
                            t25_percentage2014.append(result['results'][0]['metrics']
                        if '2015' in result['results'][0]['metrics'][0]['values'][3]
                            t25_percentage2015.append(result['results'][0]['metrics']
                        if '2016' in result['results'][0]['metrics'][0]['values'][3]
                            t25_percentage2016.append(result['results'][0]['metrics']
                        if '2017' in result['results'][0]['metrics'][0]['values'][3]
                            t25_percentage2017.append(result['results'][0]['metrics']
                        if '2018' in result['results'][0]['metrics'][0]['values'][3]
                            t25_percentage2018.append(result['results'][0]['metrics']
#                    else:
#                        t1_value2014.append('')
#                        t1_value2015.append('')
#                        t1_value2016.append('')
#                        t1_value2017.append('')
#                        t1_value2018.append('')
#                        t1_percentage2014.append('')
#                        t1_percentage2015.append('')
#                        t1_percentage2016.append('')
#                        t1_percentage2017.append('')
#                        t1_percentage2018.append('')

#                    else:
#                        t1_value2014.append('')
#                        t1_value2015.append('')
#                        t1_value2016.append('')
#                        t1_value2017.append('')
#                        t1_value2018.append('')
#                        t1_percentage2014.append('')
#                        t1_percentage2015.append('')
#                        t1_percentage2016.append('')
#                        t1_percentage2017.append('')
#                        t1_percentage2018.append('')

#                    if 'threshold' in result['results'][0]['metrics'][0]['values']:
#                        threshold.append(result['results'][0]['metrics'][0]['values


s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
#s7=pd.Series(threshold, name='threshold')
s8=pd.Series(t1_value2014, name='t1_2014')
s9=pd.Series(t1_value2015, name='t1_2015')
s10=pd.Series(t1_value2016, name='t1_2016')
s11=pd.Series(t1_value2017, name='t1_2017')
s12=pd.Series(t1_value2018, name='t1_2018')
s13=pd.Series(t1_percentage2014, name='t1_percent2014')
s14=pd.Series(t1_percentage2015, name='t1_percent2015')
s15=pd.Series(t1_percentage2016, name='t1_percent2016')
s16=pd.Series(t1_percentage2017, name='t1_percent2017')
s17=pd.Series(t1_percentage2018, name='t1_percent2018')
s18=pd.Series(t5_value2014, name='t5_2014')
s19=pd.Series(t5_value2015, name='t5_2015')
s20=pd.Series(t5_value2016, name='t5_2016')
s21=pd.Series(t5_value2017, name='t5_2017')
s22=pd.Series(t5_value2018, name='t5_2018')
s23=pd.Series(t5_percentage2014, name='t5_percent2014')
s24=pd.Series(t5_percentage2015, name='t5_percent2015')
s25=pd.Series(t5_percentage2016, name='t5_percent2016')
s26=pd.Series(t5_percentage2017, name='t5_percent2017')
s27=pd.Series(t5_percentage2018, name='t5_percent2018')
s28=pd.Series(t10_value2014, name='t10_2014')
s29=pd.Series(t10_value2015, name='t10_2015')
s30=pd.Series(t10_value2016, name='t10_2016')
s31=pd.Series(t10_value2017, name='t10_2017')
s32=pd.Series(t10_value2018, name='t10_2018')
s33=pd.Series(t10_percentage2014, name='t10_percent2014')
s34=pd.Series(t10_percentage2015, name='t10_percent2015')
s35=pd.Series(t10_percentage2016, name='t10_percent2016')
s36=pd.Series(t10_percentage2017, name='t10_percent2017')
s37=pd.Series(t10_percentage2018, name='t10_percent2018')
```

```
s38=pd.Series(t25_value2014, name='t25_2014')
s39=pd.Series(t25_value2015, name='t25_2015')
s40=pd.Series(t25_value2016, name='t25_2016')
s41=pd.Series(t25_value2017, name='t25_2017')
s42=pd.Series(t25_value2018, name='t25_2018')
s43=pd.Series(t25_percentage2014, name='t25_percent2014')
s44=pd.Series(t25_percentage2015, name='t25_percent2015')
s45=pd.Series(t25_percentage2016, name='t25_percent2016')
s46=pd.Series(t25_percentage2017, name='t25_percent2017')
s47=pd.Series(t25_percentage2018, name='t25_percent2018')


DF=pd.concat([s1,s2,s3,s4,s5,s6,s8,s9,s10,s11,s12,s13,s14,s15,s16, s17,s18,s19,s20,s
             s28,s29,s30,s31,s32,s33,s34,s35,s36,s37,s38,s39,s40, s41,s42,s43,s44,s4


DF.to_csv("THE_UNI_PubPercentile_All_17.csv", index=False)  # OK



#print(threshold)
```

16 Combine all the subfiles and subset the USA universities

17 CitationCount

```
In [234]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\CitationCount
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\CitationCount
```

```
In [235]: filename='THE_UNI_CitationCount_ALL_{}.csv'
```

```
In [237]: chucks=[]

          for i in range(1, 12):
              chucks.append(pd.read_csv(filename.format(i)))

          cc_data=pd.concat(chucks, ignore_index=True)

          cc_data.head()
```

```
Out[237]:           country countryCode  institution_id  \
          0  United Kingdom         GBR          315091
          1   United States         USA          508092
          2   United States         USA          508021
          3  United Kingdom         GBR          315068
          4   United States         USA          508219
```

```
                                                         link  \
          0  {'@href': 'https://api.elsevier.com/analytics/...
          1  {'@href': 'https://api.elsevier.com/analytics/...
          2  {'@href': 'https://api.elsevier.com/analytics/...
          3  {'@href': 'https://api.elsevier.com/analytics/...
          4  {'@href': 'https://api.elsevier.com/analytics/...

                                          institution_name     metricType      2014  \
          0                               University of Oxford  CitationCount  362631.0
          1  Jet Propulsion Laboratory, California Institut...  CitationCount   40303.0
          2                 California Institute of Technology  CitationCount  131650.0
          3                            University of Cambridge  CitationCount  264596.0
          4                                Stanford University  CitationCount  411975.0

                 2015      2016      2017      2018
          0  320264.0  245401.0  157032.0   82250.0
          1   31088.0   33761.0   19335.0    9915.0
          2   99103.0   92609.0   60850.0   31739.0
          3  241231.0  203383.0  133380.0   70147.0
          4  371956.0  290615.0  203160.0  103230.0
```

```
In [240]: cc_data.to_csv('THE_ALLUNI_CC.csv', index=True)
```

18 FWCI

```
In [241]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\FNCI"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\FNCI
```

```
In [242]: filename='THE_UNI_FWCI_{}.csv'
```

```
In [244]: chucks=[]

          for i in range(1, 12):
              chucks.append(pd.read_csv(filename.format(i)))

          fwci_data=pd.concat(chucks, ignore_index=True)

          fwci_data.head()
```

```
Out[244]:           country countryCode  institution_id  \
          0  United Kingdom         GBR          315091
          1   United States         USA          508092
          2   United States         USA          508021
          3  United Kingdom         GBR          315068
          4   United States         USA          508219
```

```
                                                link  \
0  {'@href': 'https://api.elsevier.com/analytics/...
1  {'@href': 'https://api.elsevier.com/analytics/...
2  {'@href': 'https://api.elsevier.com/analytics/...
3  {'@href': 'https://api.elsevier.com/analytics/...
4  {'@href': 'https://api.elsevier.com/analytics/...

                                    institution_name  \
0                               University of Oxford
1  Jet Propulsion Laboratory, California Institut...
2                    California Institute of Technology
3                            University of Cambridge
4                                Stanford University

                    metricType      2014      2015      2016      2017  \
0  FieldWeightedCitationImpact  2.232452  2.178834  2.202485  1.966025
1  FieldWeightedCitationImpact  1.611136  1.462793  1.656759  1.470790
2  FieldWeightedCitationImpact  1.890797  1.740487  1.921985  1.847315
3  FieldWeightedCitationImpact  1.904510  1.990053  2.050378  1.946377
4  FieldWeightedCitationImpact  2.445251  2.476393  2.568147  2.269981

       2018
0  1.804821
1  1.346227
2  1.605074
3  1.763683
4  2.244260
```

```
In [245]: fwci_data.to_csv("THE_ALLUNI_FWCI.csv", index=False)
```

19 PercPublsCited

```
In [246]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PercPublsCite
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PercPublsCited
```

```
In [247]: filename='THE_UNI_CitedPublications_{}.csv'

In [248]: chucks=[]

          for i in range(1, 12):
              chucks.append(pd.read_csv(filename.format(i)))

          cp_data=pd.concat(chucks, ignore_index=True)

          cp_data.head()
```

```
Out[248]:           country countryCode  institution_id  \
          0  United Kingdom         GBR          315091
          1   United States         USA          508092
          2   United States         USA          508021
          3  United Kingdom         GBR          315068
          4   United States         USA          508219

                                                          link  \
          0  {'@href': 'https://api.elsevier.com/analytics/...
          1  {'@href': 'https://api.elsevier.com/analytics/...
          2  {'@href': 'https://api.elsevier.com/analytics/...
          3  {'@href': 'https://api.elsevier.com/analytics/...
          4  {'@href': 'https://api.elsevier.com/analytics/...

                                              institution_name         metricType  \
          0                               University of Oxford  CitedPublications
          1  Jet Propulsion Laboratory, California Institut...  CitedPublications
          2                    California Institute of Technology  CitedPublications
          3                            University of Cambridge  CitedPublications
          4                               Stanford University  CitedPublications

                2014     2015     2016     2017     2018  percent2014  percent2015  \
          0  10893.0  11679.0  11798.0  11474.0  10570.0    86.555420     85.53537
          1   1514.0   1451.0   1722.0   1588.0   1406.0    79.142710     80.61111
          2   3879.0   3770.0   3914.0   3779.0   3487.0    85.856575     86.72648
          3   9116.0   9238.0   9558.0   9125.0   8418.0    88.060280     86.17537
          4  11156.0  11846.0  11699.0  11642.0  10731.0    87.149445     86.74575

             percent2016  percent2017  percent2018
          0    84.115210     78.56213     70.69761
          1    78.954605     77.38792     63.90909
          2    85.965300     82.74578     71.39640
          3    84.330330     79.49991     71.42372
          4    85.619150     81.79583     72.85627
```

```
In [249]: cp_data.to_csv("THEUNI_CITEDPUBLS.csv",index=False)
```

20 PubTopJournalPercentile

```
In [250]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PubTopJournalP
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PubTopJournalPercentile
```

```
In [251]: filename='THE_UNI_PubPercentile_All_{}.csv'
```

```
In [252]: chucks=[]
```

```python
for i in range(1, 18):
    chucks.append(pd.read_csv(filename.format(i)))

pp_data=pd.concat(chucks, ignore_index=True)

pp_data.head()
```

```
Out[252]:
          country countryCode  institution_id  \
0  United Kingdom         GBR          315091   
1   United States         USA          508092   
2  United Kingdom         GBR          315091   
3   United States         USA          508092   
4   United States         USA          508021   

                                                link  \
0  {'@href': 'https://api.elsevier.com/analytics/...   
1  {'@href': 'https://api.elsevier.com/analytics/...   
2  {'@href': 'https://api.elsevier.com/analytics/...   
3  {'@href': 'https://api.elsevier.com/analytics/...   
4  {'@href': 'https://api.elsevier.com/analytics/...   

                                    institution_name  \
0                               University of Oxford   
1  Jet Propulsion Laboratory, California Institut...   
2                               University of Oxford   
3  Jet Propulsion Laboratory, California Institut...   
4                 California Institute of Technology   

                            metricType  t1_2014  t1_2015  t1_2016  t1_2017  \
0  PublicationsInTopJournalPercentiles    686.0    846.0    887.0    771.0   
1  PublicationsInTopJournalPercentiles     74.0     82.0     83.0     71.0   
2  PublicationsInTopJournalPercentiles    686.0    846.0    887.0    771.0   
3  PublicationsInTopJournalPercentiles     74.0     82.0     83.0     71.0   
4  PublicationsInTopJournalPercentiles    305.0    245.0    259.0    253.0   

   ...  t25_2014  t25_2015  t25_2016  t25_2017  t25_2018  t25_percent2014  \
0  ...    8098.0    8796.0    9089.0    9372.0   10096.0         73.77915   
1  ...    1012.0    1056.0    1215.0    1195.0    1233.0         67.55675   
2  ...    8098.0    8796.0    9089.0    9372.0   10096.0         73.77915   
3  ...    1012.0    1056.0    1215.0    1195.0    1233.0         67.55675   
4  ...    2948.0    2945.0    3094.0    3108.0    3251.0         76.41265   

   t25_percent2015  t25_percent2016  t25_percent2017  t25_percent2018  
0        75.321110         73.55345        74.210150        74.923935  
1        73.333336         67.42509        66.536750        64.185320  
2        75.321110         73.55345        74.210150        74.923935  
3        73.333336         67.42509        66.536750        64.185320  
4        79.102875         77.93451        76.835594        74.752820  
```

```
[5 rows x 46 columns]
```

```
In [253]: pp_data.to_csv("THE_ALLUNI_PP.csv", index=False)
```

21 ScholarlyOutput

```
In [256]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\ScholarlyOutpu
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\ScholarlyOutput
```

```
In [257]: filename='THE_UNI_SCHOLAROUTPUT_ALL_{}.csv'
```

```
In [258]: chucks=[]

          for i in range(1, 15):
              chucks.append(pd.read_csv(filename.format(i)))

          so_data=pd.concat(chucks, ignore_index=True)

          so_data.head()
```

```
Out[258]:          country countryCode  institution_id  \
          0  United Kingdom         GBR          315091
          1   United States         USA          508092
          2   United States         USA          508021
          3  United Kingdom         GBR          315068
          4   United States         USA          508219

                                                       link  \
          0  {'@href': 'https://api.elsevier.com/analytics/...
          1  {'@href': 'https://api.elsevier.com/analytics/...
          2  {'@href': 'https://api.elsevier.com/analytics/...
          3  {'@href': 'https://api.elsevier.com/analytics/...
          4  {'@href': 'https://api.elsevier.com/analytics/...

                                          institution_name       metricType   2014  \
          0                               University of Oxford  ScholarlyOutput  12585
          1  Jet Propulsion Laboratory, California Institut...  ScholarlyOutput   1913
          2                California Institute of Technology  ScholarlyOutput   4518
          3                           University of Cambridge  ScholarlyOutput  10352
          4                               Stanford University  ScholarlyOutput  12801

              2015   2016   2017   2018
          0  13654  14026  14605  14951
          1   1800   2181   2052   2200
          2   4347   4553   4567   4884
```

```
3  10720  11334  11478  11786
4  13656  13664  14233  14729
```

```
In [259]: so_data.to_csv("THE_ALLUNI_SO.csv", index=False)
```

22 USA University Publication Output

23 Total

```
In [261]: so_data.head()
```

```
Out[261]:           country countryCode  institution_id  \
          0  United Kingdom         GBR          315091
          1   United States         USA          508092
          2   United States         USA          508021
          3  United Kingdom         GBR          315068
          4   United States         USA          508219

                                                          link  \
          0  {'@href': 'https://api.elsevier.com/analytics/...
          1  {'@href': 'https://api.elsevier.com/analytics/...
          2  {'@href': 'https://api.elsevier.com/analytics/...
          3  {'@href': 'https://api.elsevier.com/analytics/...
          4  {'@href': 'https://api.elsevier.com/analytics/...

                                            institution_name       metricType   2014  \
          0                                 University of Oxford  ScholarlyOutput  12585
          1  Jet Propulsion Laboratory, California Institut...  ScholarlyOutput   1913
          2                  California Institute of Technology  ScholarlyOutput   4518
          3                              University of Cambridge  ScholarlyOutput  10352
          4                                  Stanford University  ScholarlyOutput  12801

              2015   2016   2017   2018
          0  13654  14026  14605  14951
          1   1800   2181   2052   2200
          2   4347   4553   4567   4884
          3  10720  11334  11478  11786
          4  13656  13664  14233  14729
```

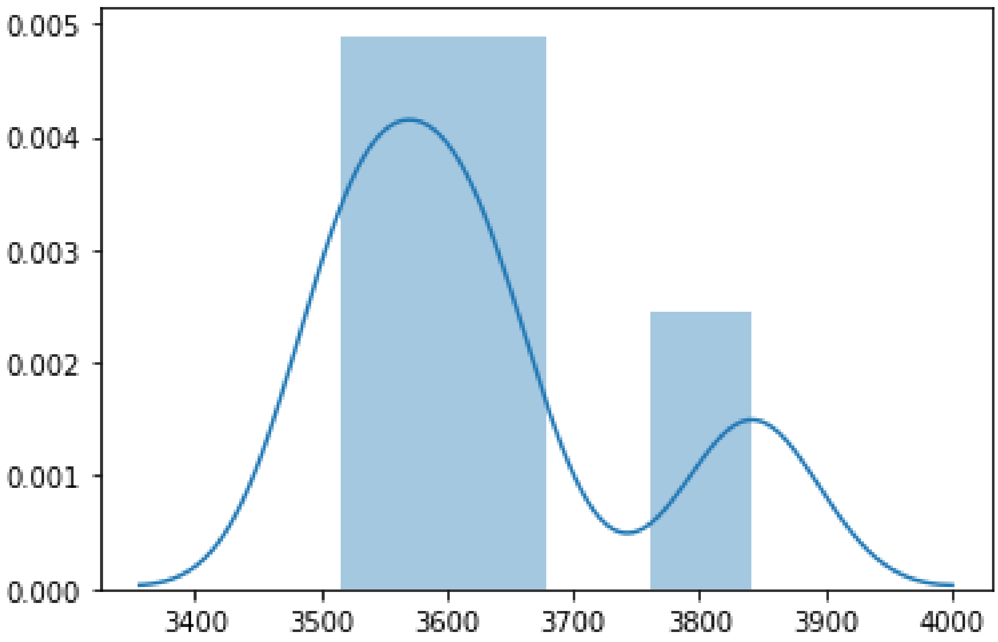
```
In [303]: so_data[so_data.countryCode=='USA'].head()
          so_data_USA=so_data[so_data.countryCode=='USA']
```

```
In [263]: import seaborn as sns
          import matplotlib.pyplot as plt
          %matplotlib inline
```

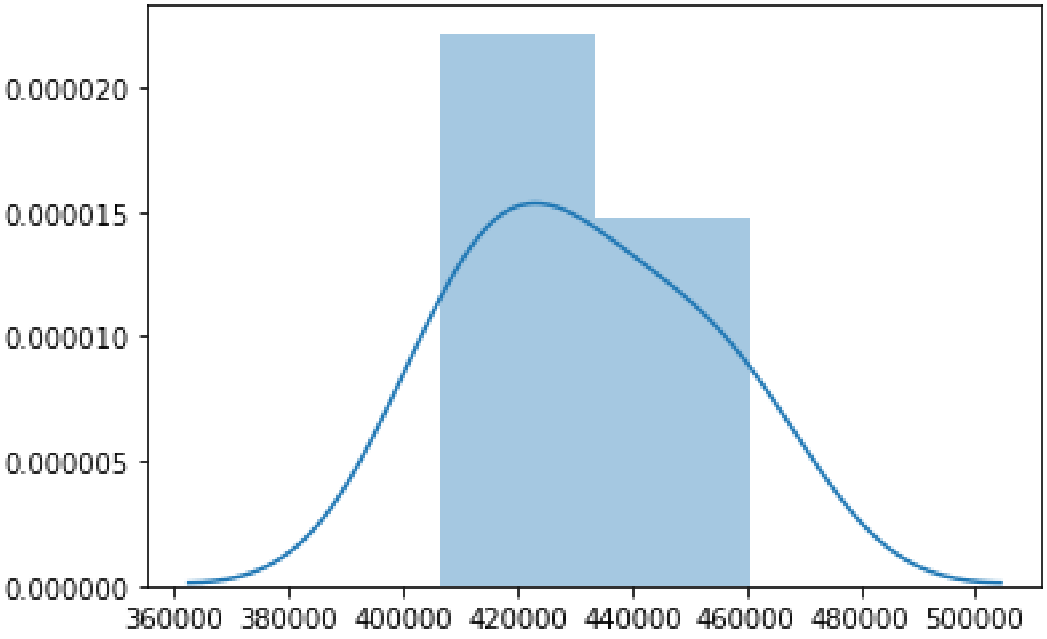
```
In [316]: so_data_USA=so_data_USA.iloc[:,-7:]
```

```
In [317]: so_data_USA.head()
```

```
Out[317]:                                     institution_name       metricType   2014  \
          1  Jet Propulsion Laboratory, California Institut...  ScholarlyOutput   1913
          2                 California Institute of Technology  ScholarlyOutput   4518
          4                                Stanford University  ScholarlyOutput  12801
          5              Massachusetts Institute of Technology  ScholarlyOutput   9645
          6                               Princeton University  ScholarlyOutput   4335

              2015   2016   2017   2018
          1   1800   2181   2052   2200
          2   4347   4553   4567   4884
          4  13656  13664  14233  14729
          5   9957  10023  10191  10458
          6   4629   4544   4635   4891

In [318]: del so_data_USA['metricType']

In [319]: so_data_USA.head()

Out[319]:                                     institution_name   2014   2015   2016  \
          1  Jet Propulsion Laboratory, California Institut...   1913   1800   2181
          2                 California Institute of Technology   4518   4347   4553
          4                                Stanford University  12801  13656  13664
          5              Massachusetts Institute of Technology   9645   9957  10023
          6                               Princeton University   4335   4629   4544

              2017   2018
          1   2052   2200
          2   4567   4884
          4  14233  14729
          5  10191  10458
          6   4635   4891

In [365]: so_data_USA=so_data_USA.set_index('institution_name')

In [366]: so_data_USA.agg('sum')

Out[366]: 2014    406395
          2015    418152
          2016    427558
          2017    443910
          2018    460523
          dtype: int64

In [379]: x=URpp.agg('sum')
          sns.distplot(x)

Out[379]: <matplotlib.axes._subplots.AxesSubplot at 0x23eefb89748>
```

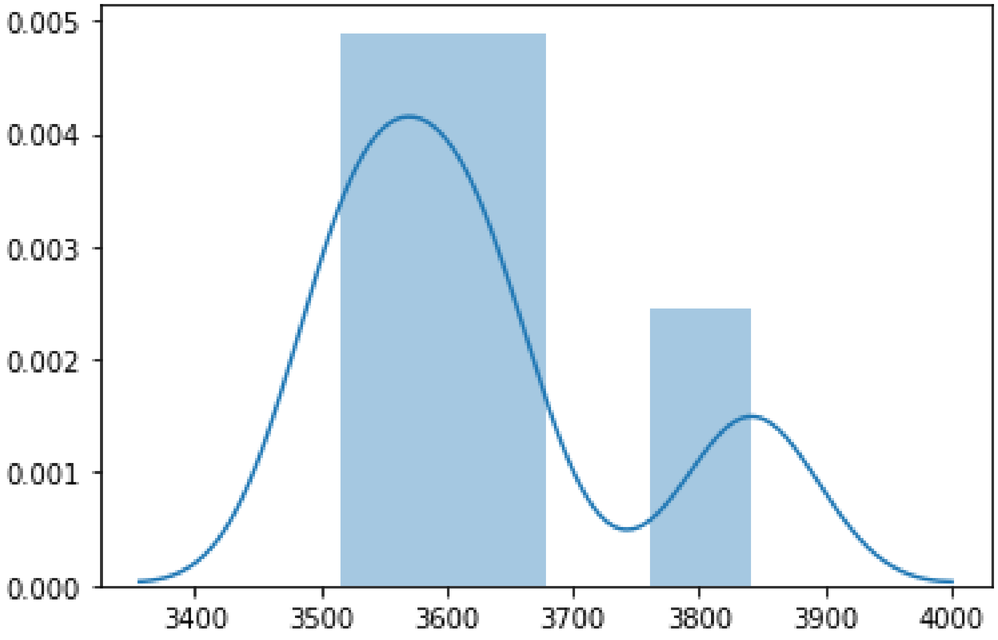


```
In [378]: sns.distplot(so_data_USA.agg('sum'))

Out[378]: <matplotlib.axes._subplots.AxesSubplot at 0x23eefb20c88>
```



```
In [346]: len(so_data_USA) # 163 USA universities

Out[346]: 163

In [347]: so_data_USA=so_data_USA.set_index('institution_name')

In [349]: so_data_USA.agg('sum')

Out[349]: 2014    406395
          2015    418152
          2016    427558
          2017    443910
          2018    460523
          dtype: int64

In [411]: so_data_USA=so_data_USA.reset_index()

In [412]: so_data_USA.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 163 entries, 0 to 162
Data columns (total 7 columns):
institution_name    163 non-null object
2014                163 non-null int64
2015                163 non-null int64
2016                163 non-null int64
2017                163 non-null int64
2018                163 non-null int64
Total               0 non-null float64
dtypes: float64(1), int64(5), object(1)
memory usage: 9.0+ KB


In [391]: sep_sum=lambda x: x.agg('sum')

In [417]: so_data_USA['Total']=so_data_USA.sum(axis=1)

In [421]: so_data_USA['Total']=so_data_USA.Total.astype(int)
          so_data_USA.head()

Out[421]:                                    institution_name   2014   2015   2016  \
          0  Jet Propulsion Laboratory, California Institut...   1913   1800   2181
          1                California Institute of Technology   4518   4347   4553
          2                               Stanford University  12801  13656  13664
          3             Massachusetts Institute of Technology   9645   9957  10023
          4                              Princeton University   4335   4629   4544

              2017   2018  Total
          0   2052   2200  10146
          1   4567   4884  22869
          2  14233  14729  69083
          3  10191  10458  50274
          4   4635   4891  23034
```

```
In [423]: URpp=URpp.reset_index()

In [424]: URpp['Total']=URpp.sum(axis=1)

In [425]: URpp

Out[425]:            institution_name  2014  2015  2016  2017  2018  Total
          0  University of Rochester  3602  3540  3515  3633  3842  18132

In [429]: # UR Publs Distribution
          inputdata=URpp[['2014','2015','2016','2017','2018']]
          sns.distplot(inputdata)

          # seems a bi-modal distribution but the overall trend is downward

Out[429]: <matplotlib.axes._subplots.AxesSubplot at 0x23eefd18ba8>
```



24 Top 1% and top 10% highly cited publications

```
In [436]: pp_data.head()

Out[436]:           country countryCode  institution_id  \
          0  United Kingdom         GBR          315091
          1   United States         USA          508092
          2  United Kingdom         GBR          315091
          3   United States         USA          508092
```

```
4   United States         USA        508021

                                             link  \
0  {'@href': 'https://api.elsevier.com/analytics/...
1  {'@href': 'https://api.elsevier.com/analytics/...
2  {'@href': 'https://api.elsevier.com/analytics/...
3  {'@href': 'https://api.elsevier.com/analytics/...
4  {'@href': 'https://api.elsevier.com/analytics/...

                                    institution_name  \
0                               University of Oxford
1  Jet Propulsion Laboratory, California Institut...
2                               University of Oxford
3  Jet Propulsion Laboratory, California Institut...
4                  California Institute of Technology

                            metricType  t1_2014  t1_2015  t1_2016  t1_2017  \
0  PublicationsInTopJournalPercentiles    686.0    846.0    887.0    771.0
1  PublicationsInTopJournalPercentiles     74.0     82.0     83.0     71.0
2  PublicationsInTopJournalPercentiles    686.0    846.0    887.0    771.0
3  PublicationsInTopJournalPercentiles     74.0     82.0     83.0     71.0
4  PublicationsInTopJournalPercentiles    305.0    245.0    259.0    253.0

   ...  t25_2014  t25_2015  t25_2016  t25_2017  t25_2018  t25_percent2014  \
0  ...    8098.0    8796.0    9089.0    9372.0   10096.0         73.77915
1  ...    1012.0    1056.0    1215.0    1195.0    1233.0         67.55675
2  ...    8098.0    8796.0    9089.0    9372.0   10096.0         73.77915
3  ...    1012.0    1056.0    1215.0    1195.0    1233.0         67.55675
4  ...    2948.0    2945.0    3094.0    3108.0    3251.0         76.41265

   t25_percent2015  t25_percent2016  t25_percent2017  t25_percent2018
0        75.321110         73.55345        74.210150        74.923935
1        73.333336         67.42509        66.536750        64.185320
2        75.321110         73.55345        74.210150        74.923935
3        73.333336         67.42509        66.536750        64.185320
4        79.102875         77.93451        76.835594        74.752820

[5 rows x 46 columns]
```

```
In [437]: USA_pp=pp_data[pp_data.countryCode=='USA']
```

```
In [439]: len(USA_pp)
```

```
Out[439]: 164
```

```
In [441]: # we want t1 and t10 values

          USA_pp.head()
```

```
Out[441]:          country countryCode  institution_id  \
          1  United States         USA          508092   
          3  United States         USA          508092   
          4  United States         USA          508021   
          6  United States         USA          508219   
          7  United States         USA          508111   

                                                          link  \
          1  {'@href': 'https://api.elsevier.com/analytics/...   
          3  {'@href': 'https://api.elsevier.com/analytics/...   
          4  {'@href': 'https://api.elsevier.com/analytics/...   
          6  {'@href': 'https://api.elsevier.com/analytics/...   
          7  {'@href': 'https://api.elsevier.com/analytics/...   

                                              institution_name  \
          1  Jet Propulsion Laboratory, California Institut...   
          3  Jet Propulsion Laboratory, California Institut...   
          4                California Institute of Technology   
          6                               Stanford University   
          7             Massachusetts Institute of Technology   

                                   metricType  t1_2014  t1_2015  t1_2016  t1_2017  \
          1  PublicationsInTopJournalPercentiles     74.0     82.0     83.0     71.0   
          3  PublicationsInTopJournalPercentiles     74.0     82.0     83.0     71.0   
          4  PublicationsInTopJournalPercentiles    305.0    245.0    259.0    253.0   
          6  PublicationsInTopJournalPercentiles    954.0   1016.0   1073.0   1027.0   
          7  PublicationsInTopJournalPercentiles    820.0    818.0    918.0    822.0   

             ...  t25_2014  t25_2015  t25_2016  t25_2017  t25_2018  t25_percent2014  \
          1  ...    1012.0    1056.0    1215.0    1195.0    1233.0         67.55675   
          3  ...    1012.0    1056.0    1215.0    1195.0    1233.0         67.55675   
          4  ...    2948.0    2945.0    3094.0    3108.0    3251.0         76.41265   
          6  ...    8211.0    8963.0    8819.0    9276.0    9716.0         75.16478   
          7  ...    5930.0    6190.0    6450.0    6475.0    6957.0         75.70535   

             t25_percent2015  t25_percent2016  t25_percent2017  t25_percent2018  
          1        73.333336        67.425090        66.536750         64.18532  
          3        73.333336        67.425090        66.536750         64.18532  
          4        79.102875        77.934510        76.835594         74.75282  
          6        76.541420        74.535164        75.279980         74.75571  
          7        75.839260        76.813150        77.120056         78.15975  

          [5 rows x 46 columns]
```

```
In [442]: USA_pp.columns
```

```
Out[442]: Index(['country', 'countryCode', 'institution_id', 'link', 'institution_name',
                 'metricType', 't1_2014', 't1_2015', 't1_2016', 't1_2017', 't1_2018',
                 't1_percent2014', 't1_percent2015', 't1_percent2016', 't1_percent2017',
                 't1_percent2018', 't5_2014', 't5_2015', 't5_2016', 't5_2017', 't5_2018',
                 't5_percent2014', 't5_percent2015', 't5_percent2016', 't5_percent2017',
                 't5_percent2018', 't10_2014', 't10_2015', 't10_2016', 't10_2017',
                 't10_2018', 't10_percent2014', 't10_percent2015', 't10_percent2016',
                 't10_percent2017', 't10_percent2018', 't25_2014', 't25_2015',
                 't25_2016', 't25_2017', 't25_2018', 't25_percent2014',
                 't25_percent2015', 't25_percent2016', 't25_percent2017',
                 't25_percent2018'],
                dtype='object')
```

```
In [443]: USA_pp=USA_pp.loc[:][['institution_name','t1_2014','t1_2015','t1_2016','t1_2017','t1_
```

```
In [445]: USA_pp=USA_pp.drop_duplicates()
```

```
In [447]: USA_pp=USA_pp.reset_index()
```

```
In [449]: USA_pp=USA_pp.iloc[:,1:]
```

```
In [450]: USA_pp.head()
```

```
Out[450]:                                     institution_name  t1_2014  t1_2015  \
          0  Jet Propulsion Laboratory, California Institut...     74.0     82.0
          1                California Institute of Technology    305.0    245.0
          2                               Stanford University    954.0   1016.0
          3             Massachusetts Institute of Technology    820.0    818.0
          4                              Princeton University    271.0    269.0

             t1_2016  t1_2017  t1_2018  t10_2014  t10_2015  t10_2016  t10_2017  t10_2018
          0     83.0     71.0    123.0     455.0     483.0     694.0     687.0     679.0
          1    259.0    253.0    293.0    1709.0    1579.0    2051.0    1906.0    1967.0
          2   1073.0   1027.0   1025.0    5558.0    6068.0    5974.0    6233.0    6307.0
          3    918.0    822.0    869.0    4401.0    4418.0    4689.0    4613.0    4781.0
          4    227.0    241.0    253.0    1810.0    1740.0    1916.0    1871.0    1990.0
```

```
In [451]: USA_pp['2014_Total']=USA_pp.loc[:][['t1_2014','t10_2014']].sum(axis=1)
```

```
In [452]: USA_pp.head()
```

```
Out[452]:                                     institution_name  t1_2014  t1_2015  \
          0  Jet Propulsion Laboratory, California Institut...     74.0     82.0
          1                California Institute of Technology    305.0    245.0
          2                               Stanford University    954.0   1016.0
          3             Massachusetts Institute of Technology    820.0    818.0
          4                              Princeton University    271.0    269.0

             t1_2016  t1_2017  t1_2018  t10_2014  t10_2015  t10_2016  t10_2017  \
          0     83.0     71.0    123.0     455.0     483.0     694.0     687.0
          1    259.0    253.0    293.0    1709.0    1579.0    2051.0    1906.0
```

```
   2   1073.0   1027.0   1025.0    5558.0    6068.0    5974.0    6233.0
   3    918.0    822.0    869.0    4401.0    4418.0    4689.0    4613.0
   4    227.0    241.0    253.0    1810.0    1740.0    1916.0    1871.0

      t10_2018  2014_Total
   0     679.0       529.0
   1    1967.0      2014.0
   2    6307.0      6512.0
   3    4781.0      5221.0
   4    1990.0      2081.0
```

```
In [453]: USA_pp['2015_Total']=USA_pp.loc[:][['t1_2015','t10_2015']].sum(axis=1)
          USA_pp['2016_Total']=USA_pp.loc[:][['t1_2016','t10_2016']].sum(axis=1)
          USA_pp['2017_Total']=USA_pp.loc[:][['t1_2017','t10_2017']].sum(axis=1)
          USA_pp['2018_Total']=USA_pp.loc[:][['t1_2018','t10_2018']].sum(axis=1)
```

```
In [454]: USA_pp.head()
```

```
Out[454]:                                      institution_name  t1_2014  t1_2015  \
          0  Jet Propulsion Laboratory, California Institut...     74.0     82.0
          1                California Institute of Technology    305.0    245.0
          2                               Stanford University    954.0   1016.0
          3              Massachusetts Institute of Technology    820.0    818.0
          4                              Princeton University    271.0    269.0

             t1_2016  t1_2017  t1_2018  t10_2014  t10_2015  t10_2016  t10_2017  \
          0     83.0     71.0    123.0     455.0     483.0     694.0     687.0
          1    259.0    253.0    293.0    1709.0    1579.0    2051.0    1906.0
          2   1073.0   1027.0   1025.0    5558.0    6068.0    5974.0    6233.0
          3    918.0    822.0    869.0    4401.0    4418.0    4689.0    4613.0
          4    227.0    241.0    253.0    1810.0    1740.0    1916.0    1871.0

             t10_2018  2014_Total  2015_Total  2016_Total  2017_Total  2018_Total
          0     679.0       529.0       565.0       777.0       758.0       802.0
          1    1967.0      2014.0      1824.0      2310.0      2159.0      2260.0
          2    6307.0      6512.0      7084.0      7047.0      7260.0      7332.0
          3    4781.0      5221.0      5236.0      5607.0      5435.0      5650.0
          4    1990.0      2081.0      2009.0      2143.0      2112.0      2243.0
```

```
In [455]: UR_percentile=USA_pp[USA_pp.institution_name=='University of Rochester']
```

```
In [457]: UR_percentile=UR_percentile.set_index('institution_name')
```

```
In [458]: UR_percentile
```

```
Out[458]:                          t1_2014  t1_2015  t1_2016  t1_2017  t1_2018  \
          institution_name
          University of Rochester    162.0    164.0    143.0    138.0    133.0
```

```
                       t10_2014  t10_2015  t10_2016  t10_2017  t10_2018  \
institution_name
University of Rochester    1404.0    1308.0    1310.0    1309.0    1318.0

                       2014_Total  2015_Total  2016_Total  2017_Total  \
institution_name
University of Rochester      1566.0      1472.0      1453.0      1447.0

                       2018_Total
institution_name
University of Rochester      1451.0
```

```
In [459]: basedata=UR_percentile[['2014_Total','2015_Total','2016_Total','2017_Total','2018_To
```

```
In [464]: basedata
```

```
Out[464]:                          2014_Total  2015_Total  2016_Total  2017_Total  \
          institution_name
          University of Rochester      1566.0      1472.0      1453.0      1447.0

                                  2018_Total
          institution_name
          University of Rochester      1451.0
```

```
In [462]: smalldata=UR_percentile.iloc[:,:10]
```

```
In [465]: smalldata1=smalldata.loc[:][['t1_2014','t1_2015','t1_2016','t1_2017','t1_2018']]
```

```
In [467]: smalldata1
```

```
Out[467]:                          t1_2014  t1_2015  t1_2016  t1_2017  t1_2018
          institution_name
          University of Rochester    162.0    164.0    143.0    138.0    133.0
```

```
In [466]: smalldata2=smalldata.loc[:][['t10_2014','t10_2015','t10_2016','t10_2017','t10_2018']]
```

```
In [468]: smalldata2
```

```
Out[468]:                          t10_2014  t10_2015  t10_2016  t10_2017  t10_2018
          institution_name
          University of Rochester    1404.0    1308.0    1310.0    1309.0    1318.0
```

```
In [478]: # UR's ScholarlyOutput

          so_data_USA.head()
```

```
Out[478]:                                institution_name   2014   2015   2016  \
          0  Jet Propulsion Laboratory, California Institut...   1913   1800   2181
          1                 California Institute of Technology   4518   4347   4553
          2                                Stanford University  12801  13656  13664
```

```
         3              Massachusetts Institute of Technology   9645   9957  10023
         4                                 Princeton University   4335   4629   4544

              2017   2018  Total
         0    2052   2200  10146
         1    4567   4884  22869
         2   14233  14729  69083
         3   10191  10458  50274
         4    4635   4891  23034
```

```
In [479]: UR_so=so_data_USA[so_data_USA.institution_name=='University of Rochester']
```

```
In [486]: UR_so
          del UR_so['Total']
```

```
In [513]: UR_so
```

```
Out[513]:                          2014  2015  2016  2017  2018
          institution_name
          University of Rochester  3602  3540  3515  3633  3842
```

```
In [514]: combinedata=pd.DataFrame({'2014':[int(162.0),int(1404.0),3602], '2015':[int(164.0),i
                                   '2016':[int(143.0), int(1310.0),3515],
                                   '2017':[int(138.0),int(1309.0),3633],
                                   '2018':[int(133.0), int(1318.0),3842]})
```

```
In [515]: combinedata
```

```
Out[515]:    2014  2015  2016  2017  2018
          0   162   164   143   138   133
          1  1404  1308  1310  1309  1318
          2  3602  3540  3515  3633  3842
```

```
In [516]: data_1=combinedata.iloc[2,:]
          data_2=combinedata.iloc[1,:]
          data_3=combinedata.iloc[0,:]
```

```
In [532]: data_1
```

```
Out[532]: 2014    3602
          2015    3540
          2016    3515
          2017    3633
          2018    3842
          Name: 2, dtype: int64
```

```
In [533]: A=pd.DataFrame(data=[data_1[:5]], columns=['2014','2015','2016','2017','2018'])
```

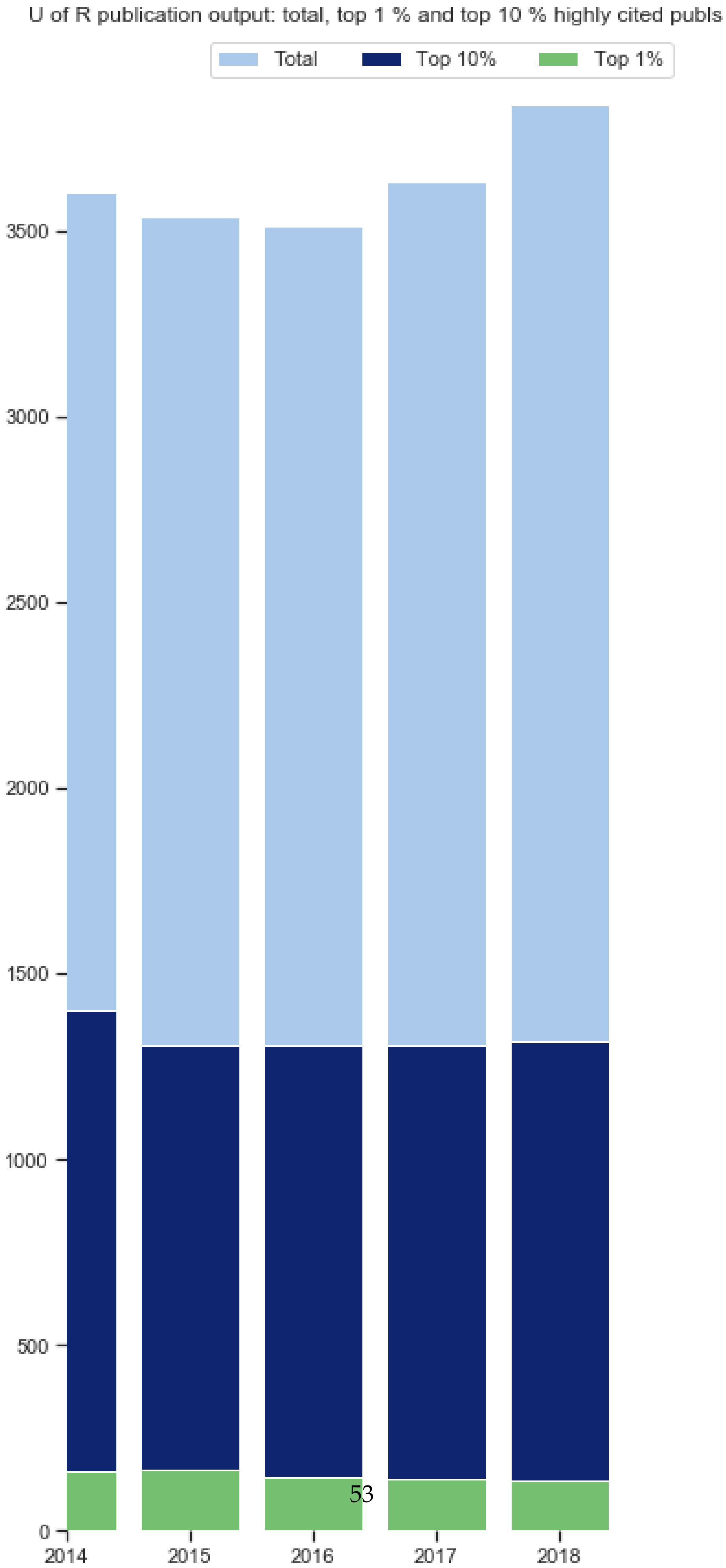
```
In [534]: A
```

```
Out[534]:    2014  2015  2016  2017  2018
          2  3602  3540  3515  3633  3842
```

```
In [535]: B=pd.DataFrame(data=[data_2[:5]], columns=['2014','2015','2016','2017','2018'])
```

```
In [536]: C=pd.DataFrame(data=[data_3[:5]], columns=['2014','2015','2016','2017','2018'])
```

```
In [538]: import seaborn as sns
          import matplotlib.pyplot as plt
          sns.set(style="whitegrid")
          sns.set_style("ticks", {"xtick.major.size": 10, "ytick.major.size": 8})

          # Initialize the matplotlib figure
          f, ax = plt.subplots(figsize=(6, 15))

          # Load the example car crash dataset
          #crashes = sns.load_dataset("car_crashes").sort_values("total", ascending=False)

          # Plot the total crashes
          sns.set_color_codes("pastel")
          sns.barplot(data=A,
                      label="Total", color="b")

          # Plot the crashes where alcohol was involved
          sns.set_color_codes("dark")
          sns.barplot(data=B,
                      label="Top 10%", color="b")

          # Plot the crashes where alcohol was involved
          sns.set_color_codes("muted")
          sns.barplot(data=C,
                      label="Top 1%", color="g")


          # Add a legend and informative axis label
          plt.yticks(np.arange(0, 4000, step=500))
          plt.xticks(np.arange(5), ('2014', '2015', '2016', '2017', '2018'))
          ax.legend(ncol=3, loc="upper right", frameon=True)
          ax.set(xlim=(0,5), ylabel="",
                 title="U of R publication output: total, top 1 % and top 10 % highly cited pul
          sns.despine(left=True, bottom=True)
```


U of R publication output: total, top 1 % and top 10 % highly cited publs
Total
Top 10%
Top 1%
3500
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018

25 From 2014-2018 ,our top 1% cited publs and top10% cited pulbs slightly dropped a little, but because our 2018 total publs increased a lot, our % pulb. cited would drop

26 Trends in FWCI values of total U of R publication output

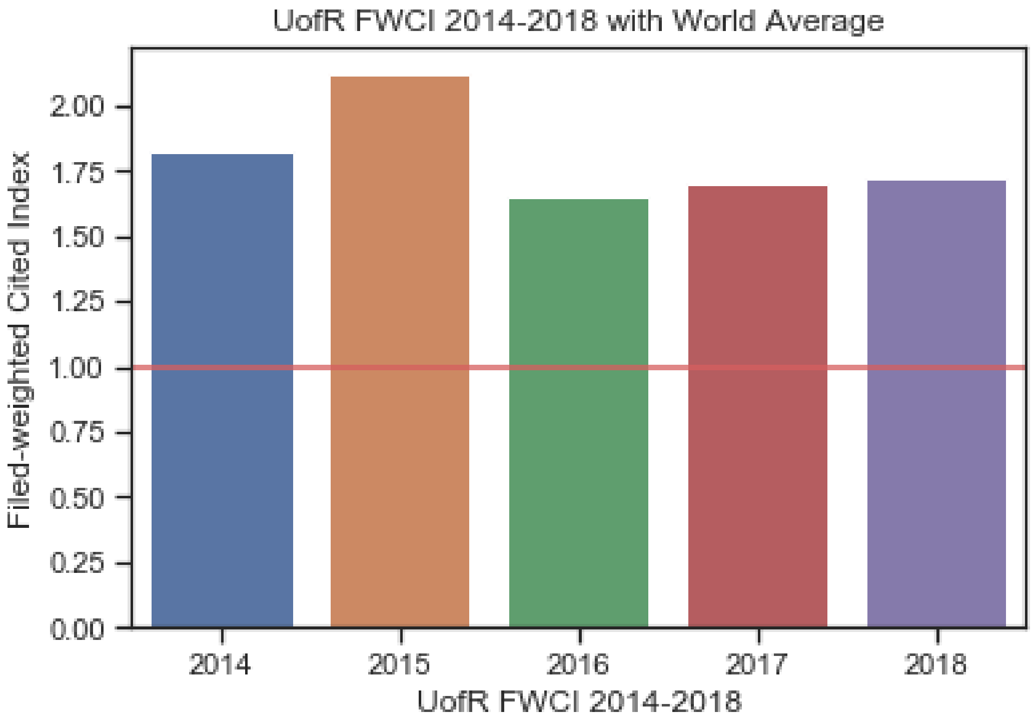
```
In [539]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\FNCI"

C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\FNCI


In [540]: FWCI_all=pd.read_csv('THE_ALLUNI_FWCI.csv')

In [541]: FWCI_all.head()

Out[541]:          country countryCode  institution_id  \
          0  United Kingdom         GBR          315091
          1   United States         USA          508092
          2   United States         USA          508021
          3  United Kingdom         GBR          315068
          4   United States         USA          508219

                                                  link  \
          0  {'@href': 'https://api.elsevier.com/analytics/...
          1  {'@href': 'https://api.elsevier.com/analytics/...
          2  {'@href': 'https://api.elsevier.com/analytics/...
          3  {'@href': 'https://api.elsevier.com/analytics/...
          4  {'@href': 'https://api.elsevier.com/analytics/...

                                      institution_name  \
          0                               University of Oxford
          1  Jet Propulsion Laboratory, California Institut...
          2                California Institute of Technology
          3                           University of Cambridge
          4                               Stanford University

                         metricType      2014      2015      2016      2017  \
          0  FieldWeightedCitationImpact  2.232452  2.178834  2.202485  1.966025
          1  FieldWeightedCitationImpact  1.611136  1.462793  1.656759  1.470790
          2  FieldWeightedCitationImpact  1.890797  1.740487  1.921985  1.847315
          3  FieldWeightedCitationImpact  1.904510  1.990053  2.050378  1.946377
          4  FieldWeightedCitationImpact  2.445251  2.476393  2.568147  2.269981

                 2018
```

```
         0    1.804821
         1    1.346227
         2    1.605074
         3    1.763683
         4    2.244260
```

```
In [548]: UR_FWCI=FWCI_all[FWCI_all.institution_name=='University of Rochester']

In [550]: UR_FWCI=UR_FWCI.iloc[:, -7:]

In [553]: del UR_FWCI['metricType']

In [556]: UR_FWCI

Out[556]:            institution_name      2014      2015      2016      2017  \
          1259  University of Rochester  1.827581  2.117681  1.646356  1.700714

                    2018
          1259  1.717541
```

27 UofR FWCI

```
In [573]: sns.barplot(data=UR_FWCI)
          plt.axhline(1.00, ls='-', color='r')
          plt.title('UofR FWCI 2014-2018 with World Average')
          plt.xlabel("UofR FWCI 2014-2018")
          plt.ylabel("Filed-weighted Cited Index")

Out[573]: Text(0, 0.5, 'Filed-weighted Cited Index')
```



28 Our FWCI have always been above global average which is 1.00

29 Comparator analysis: top 10 % highly cited publications for USA universities

```
In [574]: USA_pp.head()
```

```
Out[574]:                                     institution_name  t1_2014  t1_2015  \
          0  Jet Propulsion Laboratory, California Institut...     74.0     82.0
          1                 California Institute of Technology    305.0    245.0
          2                                Stanford University    954.0   1016.0
          3              Massachusetts Institute of Technology    820.0    818.0
          4                               Princeton University    271.0    269.0

             t1_2016  t1_2017  t1_2018  t10_2014  t10_2015  t10_2016  t10_2017  \
          0     83.0     71.0    123.0     455.0     483.0     694.0     687.0
          1    259.0    253.0    293.0    1709.0    1579.0    2051.0    1906.0
          2   1073.0   1027.0   1025.0    5558.0    6068.0    5974.0    6233.0
          3    918.0    822.0    869.0    4401.0    4418.0    4689.0    4613.0
          4    227.0    241.0    253.0    1810.0    1740.0    1916.0    1871.0

             t10_2018  2014_Total  2015_Total  2016_Total  2017_Total  2018_Total
          0     679.0       529.0       565.0       777.0       758.0       802.0
          1    1967.0      2014.0      1824.0      2310.0      2159.0      2260.0
          2    6307.0      6512.0      7084.0      7047.0      7260.0      7332.0
          3    4781.0      5221.0      5236.0      5607.0      5435.0      5650.0
          4    1990.0      2081.0      2009.0      2143.0      2112.0      2243.0
```

```
In [575]: UR_peer=['Boston University','Carnegie Mellon University','Case Western Reserve Unive
                  'Northwestern University','Vanderbilt University','Washington University','Jo
                  'Stanford University','Tulane University','University of Chicago','Universit
```

```
In [581]: UR_peer_df=pd.DataFrame({'UR_Peer':UR_peer})
```

```
In [613]: UR_peer_df
```

```
Out[613]:                               UR_Peer
          0                   Boston University
          1          Carnegie Mellon University
          2     Case Western Reserve University
          3                     Duke University
          4                    Emory University
          5             Northwestern University
          6               Vanderbilt University
          7               Washington University
```

```
8            Johns Hopkins University
9                 New York University
10                Stanford University
11                  Tulane University
12              University of Chicago
13         University of Pennsylvania
14   University of Southern California
```

```
In [616]: result=[]

          for name in UR_peer_df.UR_Peer:
              if USA_pp[USA_pp.institution_name==name] is not None:
                  result.append(1)
              else:
                  result.append(0)

          len(result)
```

```
Out[616]: 15
```

```
In [595]: data=[]
          for name in UR_peer:
              if name in USA_pp.institution_name:
                  data.append('T')
              else:
                  data.append('F')

          data
```

```
Out[595]: ['F', 'F', 'F', 'F', 'F', 'F', 'F', 'F', 'F', 'F', 'F', 'F', 'F', 'F', 'F']
```

```
In [588]: UR_peer_df.loc[:]['Result']=data
```

```
In [624]: UR_peer_df['UR_Peer']
```

```
Out[624]: 0                       Boston University
          1               Carnegie Mellon University
          2         Case Western Reserve University
          3                         Duke University
          4                        Emory University
          5                 Northwestern University
          6                   Vanderbilt University
          7                   Washington University
          8                Johns Hopkins University
          9                     New York University
          10                    Stanford University
          11                      Tulane University
          12                  University of Chicago
          13             University of Pennsylvania
          14      University of Southern California
          Name: UR_Peer, dtype: object
```

30 Get UofR's Global set's Publication in Top Journal Percentile

```
In [626]: chuck=[]
          for name in UR_peer_df['UR_Peer']:
              chuck.append(USA_pp[USA_pp.institution_name==name])
```

```
In [628]: DF=pd.concat(chuck, ignore_index=True)
```

```
In [629]: DF.head()
```

```
Out[629]:                   institution_name  t1_2014  t1_2015  t1_2016  t1_2017  \
          0                Boston University    309.0    320.0    365.0    351.0
          1  Case Western Reserve University    174.0    172.0    206.0    198.0
          2                  Duke University    541.0    508.0    563.0    543.0
          3           Northwestern University    511.0    526.0    621.0    527.0
          4             Vanderbilt University    295.0    339.0    320.0    316.0

             t1_2018  t10_2014  t10_2015  t10_2016  t10_2017  t10_2018  2014_Total  \
          0    369.0    2219.0    2296.0    2421.0    2580.0    2564.0      2528.0
          1    163.0    1516.0    1551.0    1572.0    1594.0    1513.0      1690.0
          2    478.0    3823.0    3910.0    3747.0    3828.0    3875.0      4364.0
          3    603.0    3313.0    3412.0    3524.0    3682.0    3636.0      3824.0
          4    335.0    2301.0    2355.0    2516.0    2516.0    2492.0      2596.0

             2015_Total  2016_Total  2017_Total  2018_Total
          0      2616.0      2786.0      2931.0      2933.0
          1      1723.0      1778.0      1792.0      1676.0
          2      4418.0      4310.0      4371.0      4353.0
          3      3938.0      4145.0      4209.0      4239.0
          4      2694.0      2836.0      2832.0      2827.0
```

```
In [633]: UR_percentile=UR_percentile.reset_index()
```

```
In [632]: Global_top10=DF.loc[:][['institution_name','t10_2014','t10_2015','t10_2016','t10_201
```

```
In [634]: UR_pcer_top10=UR_percentile.loc[:][['institution_name','t10_2014','t10_2015','t10_20
```

```
In [635]: Global_top10.head()
```

```
Out[635]:                   institution_name  t10_2014  t10_2015  t10_2016  t10_2017  \
          0                Boston University    2219.0    2296.0    2421.0    2580.0
          1  Case Western Reserve University    1516.0    1551.0    1572.0    1594.0
          2                  Duke University    3823.0    3910.0    3747.0    3828.0
          3           Northwestern University    3313.0    3412.0    3524.0    3682.0
          4             Vanderbilt University    2301.0    2355.0    2516.0    2516.0

             t10_2018
          0    2564.0
          1    1513.0
```

```
         2    3875.0
         3    3636.0
         4    2492.0

In [637]: Global_top10['Top10_Total']=Global_top10.sum(axis=1)

In [638]: Global_top10.head()

Out[638]:                  institution_name  t10_2014  t10_2015  t10_2016  t10_2017  \
         0                Boston University    2219.0    2296.0    2421.0    2580.0
         1  Case Western Reserve University    1516.0    1551.0    1572.0    1594.0
         2                  Duke University    3823.0    3910.0    3747.0    3828.0
         3          Northwestern University    3313.0    3412.0    3524.0    3682.0
         4            Vanderbilt University    2301.0    2355.0    2516.0    2516.0

            t10_2018  Top10_Total
         0    2564.0      12080.0
         1    1513.0       7746.0
         2    3875.0      19183.0
         3    3636.0      17567.0
         4    2492.0      12180.0

In [661]: len(Global_top10)

Out[661]: 11

In [636]: UR_pcer_top10

Out[636]:          institution_name  t10_2014  t10_2015  t10_2016  t10_2017  t10_2018
         0  University of Rochester    1404.0    1308.0    1310.0    1309.0    1318.0

In [639]: UR_pcer_top10['Top10_Total']=UR_pcer_top10.sum(axis=1)

In [640]: UR_pcer_top10

Out[640]:          institution_name  t10_2014  t10_2015  t10_2016  t10_2017  t10_2018  \
         0  University of Rochester    1404.0    1308.0    1310.0    1309.0    1318.0

            Top10_Total
         0       6649.0

In [641]: Gall=pd.concat([Global_top10, UR_pcer_top10])

In [660]: len(Gall)

Out[660]: 12

In [647]: import re
In [658]: abb=[]
          for i in Gall.institution_name:
              abb.append(i.split("\t")[0].strip(" "))
          abb

Out[658]: ['Boston University',
           'Case Western Reserve University',
           'Duke University',
           'Northwestern University',
           'Vanderbilt University',
           'Johns Hopkins University',
           'New York University',
           'Stanford University',
           'Tulane University',
           'University of Chicago',
           'University of Pennsylvania',
           'University of Rochester']
```

```
In [682]: Gall['UniAbbr']=['Boston','CWRU','Duke','Northwestern','Vanderbilt','JohnsHopkins','N
```

```
In [684]: Gall=Gall.sort_values(by='Top10_Total', ascending=False)
```

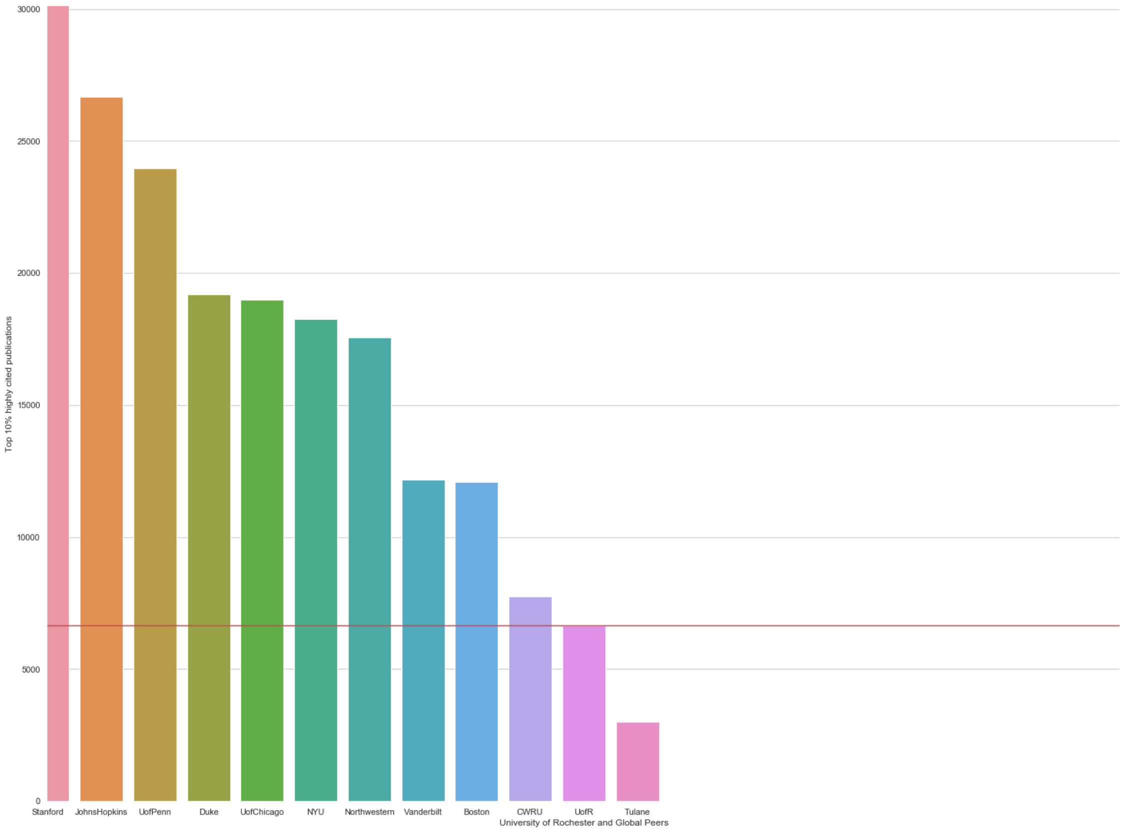
31 Comparator analysis: top 10% highly cited publications UR and GlobalPeers

```
In [699]: for index, row in Gall.iterrows():
              print(row.UniAbbr)
              print(int(row.Top10_Total))
```

```
Stanford
30140
JohnsHopkins
26670
UofPenn
23969
Duke
19183
UofChicago
18983
NYU
18246
Northwestern
17567
Vanderbilt
12180
Boston
12080
CWRU
```

```
7746
UofR
6649
Tulane
3003
```

```
In [791]: sns.set(style="whitegrid")

          # Initialize the matplotlib figure
          f, ax = plt.subplots(figsize=(25, 20))
          sns.barplot(x=Gall.UniAbbr, y=Gall.Top10_Total, data=Gall)
          plt.axhline(6649, ls='-', color='r')

          #ax.text(Gall.UniAbbr, Gall.Top10_Total,color='black', ha="center")

          # Add a legend and informative axis label
          #ax.legend(ncol=12, loc="upper right", frameon=True)
          ax.set(xlim=(0, 20),
                 xlabel="University of Rochester and Global Peers", ylabel="Top 10% highly cite
          sns.despine(left=True, bottom=True)
```



32 Among our other 11 USA peers, our top 10% highly-cited pulbs ranks behind

33 Comparator analysis: Field-weighted Citation Impact

```
In [709]: fwci_data.head()
```

```
Out[709]:           country countryCode  institution_id  \
          0  United Kingdom         GBR          315091   
          1   United States         USA          508092   
          2   United States         USA          508021   
          3  United Kingdom         GBR          315068   
          4   United States         USA          508219   

                                                          link  \
          0  {'@href': 'https://api.elsevier.com/analytics/...   
          1  {'@href': 'https://api.elsevier.com/analytics/...   
          2  {'@href': 'https://api.elsevier.com/analytics/...   
          3  {'@href': 'https://api.elsevier.com/analytics/...   
          4  {'@href': 'https://api.elsevier.com/analytics/...   

                                              institution_name  \
          0                               University of Oxford   
          1  Jet Propulsion Laboratory, California Institut...   
          2                 California Institute of Technology   
          3                            University of Cambridge   
          4                                Stanford University   

                              metricType      2014      2015      2016      2017  \
          0  FieldWeightedCitationImpact  2.232452  2.178834  2.202485  1.966025   
          1  FieldWeightedCitationImpact  1.611136  1.462793  1.656759  1.470790   
          2  FieldWeightedCitationImpact  1.890797  1.740487  1.921985  1.847315   
          3  FieldWeightedCitationImpact  1.904510  1.990053  2.050378  1.946377   
          4  FieldWeightedCitationImpact  2.445251  2.476393  2.568147  2.269981   

                 2018  
          0  1.804821  
          1  1.346227  
          2  1.605074  
          3  1.763683  
          4  2.244260  
```

```
In [711]: US_fwci=fwci_data[fwci_data.countryCode=='USA']
```

```
In [712]: US_fwci.head()
```

```
Out[712]:          country countryCode  institution_id  \
          1  United States         USA          508092   
```

```
2  United States         USA          508021
4  United States         USA          508219
5  United States         USA          508111
6  United States         USA          508191

                                              link  \
1  {'@href': 'https://api.elsevier.com/analytics/...
2  {'@href': 'https://api.elsevier.com/analytics/...
4  {'@href': 'https://api.elsevier.com/analytics/...
5  {'@href': 'https://api.elsevier.com/analytics/...
6  {'@href': 'https://api.elsevier.com/analytics/...

                                  institution_name  \
1  Jet Propulsion Laboratory, California Institut...
2                  California Institute of Technology
4                                 Stanford University
5               Massachusetts Institute of Technology
6                                Princeton University

                    metricType      2014      2015      2016      2017  \
1  FieldWeightedCitationImpact  1.611136  1.462793  1.656759  1.470790
2  FieldWeightedCitationImpact  1.890797  1.740487  1.921985  1.847315
4  FieldWeightedCitationImpact  2.445251  2.476393  2.568147  2.269981
5  FieldWeightedCitationImpact  2.271606  2.301666  2.355942  2.132760
6  FieldWeightedCitationImpact  2.111493  2.144071  2.101741  1.906495

       2018
1  1.346227
2  1.605074
4  2.244260
5  1.971292
6  1.919808
```

```
In [713]: UR_peer_df
```

```
Out[713]:                          UR_Peer
          0              Boston University
          1         Carnegie Mellon University
          2     Case Western Reserve University
          3                Duke University
          4               Emory University
          5          Northwestern University
          6            Vanderbilt University
          7            Washington University
          8          Johns Hopkins University
          9             New York University
          10            Stanford University
          11              Tulane University
```

```
12              University of Chicago
13          University of Pennsylvania
14   University of Southern California
```

```
In [715]: len(Gall.institution_name) # Global peers and UofR
```

```
Out[715]: 12
```

```
In [759]: chuck=[]

          for name in Gall.institution_name:
              if US_fwci[US_fwci.institution_name==name] is not None:
                  chuck.append(US_fwci[US_fwci.institution_name==name])
```

```
In [760]: UR_Peer_FWCI=pd.concat(chuck, ignore_index=True)
```

```
In [761]: UR_Peer_FWCI
```

```
Out[761]:           country countryCode  institution_id  \
          0   United States         USA          508219
          1   United States         USA          508094
          2   United States         USA          508331
          3   United States         USA          508053
          4   United States         USA          508270
          5   United States         USA          508166
          6   United States         USA          508166
          7   United States         USA          508175
          8   United States         USA          508175
          9   United States         USA          508363
          10  United States         USA          508013
          11  United States         USA          508032
          12  United States         USA          508335
          13  United States         USA          508239

                                                           link  \
          0   {'@href': 'https://api.elsevier.com/analytics/...
          1   {'@href': 'https://api.elsevier.com/analytics/...
          2   {'@href': 'https://api.elsevier.com/analytics/...
          3   {'@href': 'https://api.elsevier.com/analytics/...
          4   {'@href': 'https://api.elsevier.com/analytics/...
          5   {'@href': 'https://api.elsevier.com/analytics/...
          6   {'@href': 'https://api.elsevier.com/analytics/...
          7   {'@href': 'https://api.elsevier.com/analytics/...
          8   {'@href': 'https://api.elsevier.com/analytics/...
          9   {'@href': 'https://api.elsevier.com/analytics/...
          10  {'@href': 'https://api.elsevier.com/analytics/...
          11  {'@href': 'https://api.elsevier.com/analytics/...
          12  {'@href': 'https://api.elsevier.com/analytics/...
          13  {'@href': 'https://api.elsevier.com/analytics/...
```

```
                     institution_name                     metricType      2014  \
0                 Stanford University  FieldWeightedCitationImpact  2.445251
1             Johns Hopkins University  FieldWeightedCitationImpact  2.039671
2           University of Pennsylvania  FieldWeightedCitationImpact  2.049064
3                     Duke University  FieldWeightedCitationImpact  2.060966
4               University of Chicago  FieldWeightedCitationImpact  1.899739
5                 New York University  FieldWeightedCitationImpact  2.036910
6                 New York University  FieldWeightedCitationImpact  2.036910
7             Northwestern University  FieldWeightedCitationImpact  1.814437
8             Northwestern University  FieldWeightedCitationImpact  1.814437
9               Vanderbilt University  FieldWeightedCitationImpact  1.935092
10                  Boston University  FieldWeightedCitationImpact  2.102325
11  Case Western Reserve University  FieldWeightedCitationImpact  1.785904
12            University of Rochester  FieldWeightedCitationImpact  1.827581
13                  Tulane University  FieldWeightedCitationImpact  1.272190

        2015      2016      2017      2018
0   2.476393  2.568147  2.269981  2.244260
1   2.063183  2.086808  1.941970  1.903996
2   2.078196  2.042546  1.896038  1.865539
3   2.188656  1.971610  1.903780  1.848280
4   1.866923  2.041074  1.860755  1.800015
5   2.071903  1.961854  1.787898  1.819667
6   2.071903  1.961854  1.787898  1.819667
7   2.036129  2.104611  2.028618  1.968102
8   2.036129  2.104611  2.028618  1.968102
9   2.053712  1.799374  1.751226  1.698510
10  2.017788  2.082099  1.699757  1.916557
11  1.952037  1.955858  1.773011  1.861512
12  2.117681  1.646356  1.700714  1.717541
13  1.784176  1.650411  1.381838  1.569006
```

```
In [719]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\FNCI"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\FNCI
```

```
In [720]: UR_Peer_FWCI.to_csv('UR_Global_Peer_FWCI_Comparison.csv', index=False)
```

```
In [762]: UR_Peer_FWCI=UR_Peer_FWCI.iloc[:, -7:]
```

```
In [763]: UR_Peer_FWCI
```

```
Out[763]:                    institution_name                     metricType      2014  \
          0                 Stanford University  FieldWeightedCitationImpact  2.445251
          1            Johns Hopkins University  FieldWeightedCitationImpact  2.039671
          2          University of Pennsylvania  FieldWeightedCitationImpact  2.049064
          3                     Duke University  FieldWeightedCitationImpact  2.060966
```

```
4            University of Chicago  FieldWeightedCitationImpact  1.899739
5              New York University  FieldWeightedCitationImpact  2.036910
6              New York University  FieldWeightedCitationImpact  2.036910
7          Northwestern University  FieldWeightedCitationImpact  1.814437
8          Northwestern University  FieldWeightedCitationImpact  1.814437
9            Vanderbilt University  FieldWeightedCitationImpact  1.935092
10               Boston University  FieldWeightedCitationImpact  2.102325
11  Case Western Reserve University  FieldWeightedCitationImpact  1.785904
12         University of Rochester  FieldWeightedCitationImpact  1.827581
13               Tulane University  FieldWeightedCitationImpact  1.272190

        2015      2016      2017      2018
0   2.476393  2.568147  2.269981  2.244260
1   2.063183  2.086808  1.941970  1.903996
2   2.078196  2.042546  1.896038  1.865539
3   2.188656  1.971610  1.903780  1.848280
4   1.866923  2.041074  1.860755  1.800015
5   2.071903  1.961854  1.787898  1.819667
6   2.071903  1.961854  1.787898  1.819667
7   2.036129  2.104611  2.028618  1.968102
8   2.036129  2.104611  2.028618  1.968102
9   2.053712  1.799374  1.751226  1.698510
10  2.017788  2.082099  1.699757  1.916557
11  1.952037  1.955858  1.773011  1.861512
12  2.117681  1.646356  1.700714  1.717541
13  1.784176  1.650411  1.381838  1.569006
```

```
In [741]: Gall.UniAbbr
```

```
Out[741]: 7         Stanford
          5     JohnsHopkins
          10         UofPenn
          2             Duke
          9       UofChicago
          6              NYU
          3     Northwestern
          4       Vanderbilt
          0           Boston
          1             CWRU
          0             UofR
          8           Tulane
          Name: UniAbbr, dtype: object
```

```
In [771]: abb=[]
          for name in Gall.UniAbbr:
              abb.append(name)
          abb
```

```
Out[771]: ['Stanford',
           'JohnsHopkins',
           'UofPenn',
           'Duke',
           'UofChicago',
           'NYU',
           'Northwestern',
           'Vanderbilt',
           'Boston',
           'CWRU',
           'UofR',
           'Tulane']
```

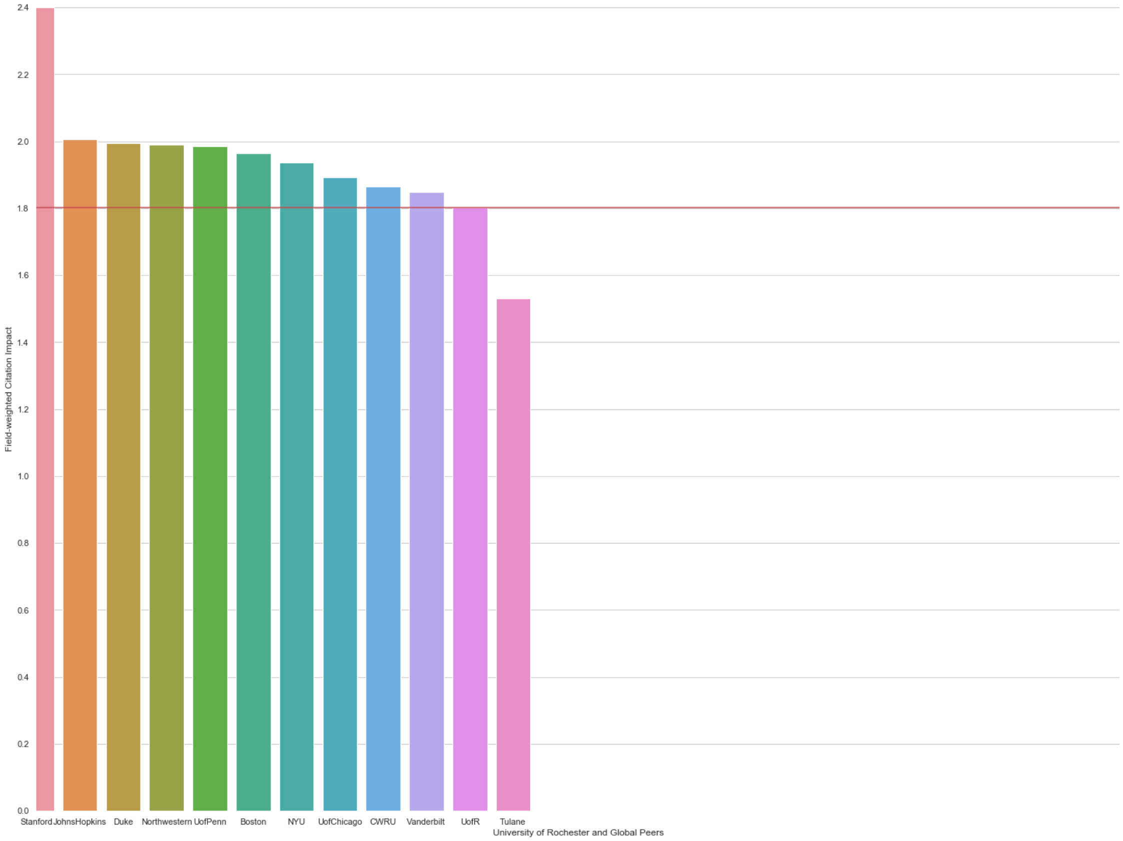
```
In [764]: UR_Peer_FWCI=UR_Peer_FWCI.drop_duplicates()

In [765]: UR_Peer_FWCI.reset_index(inplace=True, drop=True)

In [774]: UR_Peer_FWCI.loc[:]['UniAbbr']=abb

In [775]: UR_Peer_FWCI.head()

Out[775]:             institution_name                   metricType      2014  \
          0        Stanford University  FieldWeightedCitationImpact  2.445251
          1    Johns Hopkins University  FieldWeightedCitationImpact  2.039671
          2  University of Pennsylvania  FieldWeightedCitationImpact  2.049064
          3             Duke University  FieldWeightedCitationImpact  2.060966
          4       University of Chicago  FieldWeightedCitationImpact  1.899739

                 2015      2016      2017      2018       UniAbbr
          0  2.476393  2.568147  2.269981  2.244260      Stanford
          1  2.063183  2.086808  1.941970  1.903996  JohnsHopkins
          2  2.078196  2.042546  1.896038  1.865539       UofPenn
          3  2.188656  1.971610  1.903780  1.848280          Duke
          4  1.866923  2.041074  1.860755  1.800015    UofChicago

In [777]: UR_Peer_FWCI.loc[:]['AVERAGE_FWCI']=round(UR_Peer_FWCI[['2014','2015','2016','2017',

In [778]: UR_Peer_FWCI=UR_Peer_FWCI.sort_values(by='AVERAGE_FWCI', ascending=False)

In [779]: UR_Peer_FWCI.head()

Out[779]:             institution_name                   metricType      2014  \
          0        Stanford University  FieldWeightedCitationImpact  2.445251
          1    Johns Hopkins University  FieldWeightedCitationImpact  2.039671
          3             Duke University  FieldWeightedCitationImpact  2.060966
          6     Northwestern University  FieldWeightedCitationImpact  1.814437
          2  University of Pennsylvania  FieldWeightedCitationImpact  2.049064

                 2015      2016      2017      2018       UniAbbr  AVERAGE_FWCI
          0  2.476393  2.568147  2.269981  2.244260      Stanford        2.4008
          1  2.063183  2.086808  1.941970  1.903996  JohnsHopkins        2.0071
          3  2.188656  1.971610  1.903780  1.848280          Duke        1.9947
          6  2.036129  2.104611  2.028618  1.968102  Northwestern        1.9904
          2  2.078196  2.042546  1.896038  1.865539       UofPenn        1.9863
```

```
In [785]: UR_Peer_FWCI[UR_Peer_FWCI.UniAbbr=='UofR']
```

```
Out[785]:            institution_name                     metricType      2014      2015  \
          10  University of Rochester  FieldWeightedCitationImpact  1.827581  2.117681

                  2016      2017      2018 UniAbbr  AVERAGE_FWCI
          10  1.646356  1.700714  1.717541    UofR         1.802
```

34 Comparatory analysis: Field-weighted Citation Impact

```
In [790]: sns.set(style="whitegrid")

          # Initialize the matplotlib figure
          f, ax = plt.subplots(figsize=(25, 20))
          sns.barplot(x=UR_Peer_FWCI.UniAbbr, y=UR_Peer_FWCI.AVERAGE_FWCI, data=UR_Peer_FWCI)
          plt.axhline(1.802, ls='-', color='r')

          #ax.text(Gall.UniAbbr, Gall.Top10_Total,color='black', ha="center")

          # Add a legend and informative axis label
          #ax.legend(ncol=12, loc="upper right", frameon=True)
          plt.yticks(np.arange(0, 2.5, step=0.2))
          ax.set(xlim=(0, 25),
                 xlabel="University of Rochester and Global Peers", ylabel="Field-weighted Cita
          sns.despine(left=True, bottom=True)
```



35 Our average FWCI 2014-2018 is 1.8, but most of our USA peers have higher FWCI, this may be the reason our overall score did not reflect our good FWCI

36 Comparatory analysis: research performance profile

```
In [793]: UR_Peer_FWCI.institution_name
```

```
Out[793]: 0                Stanford University
          1           Johns Hopkins University
          3                    Duke University
          6            Northwestern University
          2         University of Pennsylvania
          8                  Boston University
          5                New York University
          4              University of Chicago
          9     Case Western Reserve University
          7              Vanderbilt University
```

```
         10           University of Rochester
         11                  Tulane University
         Name: institution_name, dtype: object

In [794]: so_data_USA.head()

Out[794]:                                     institution_name   2014   2015   2016  \
         0  Jet Propulsion Laboratory, California Institut...   1913   1800   2181
         1                 California Institute of Technology   4518   4347   4553
         2                                Stanford University  12801  13656  13664
         3              Massachusetts Institute of Technology   9645   9957  10023
         4                               Princeton University   4335   4629   4544

             2017   2018  Total
         0   2052   2200  10146
         1   4567   4884  22869
         2  14233  14729  69083
         3  10191  10458  50274
         4   4635   4891  23034

In [800]: chuck=[]

          for name in UR_Peer_FWCI.institution_name:
              chuck.append(so_data_USA[so_data_USA.institution_name==name])

In [801]: Ttl_publs_output=pd.concat(chuck, ignore_index=True)

In [883]: A=Ttl_publs_output[['institution_name','Total']]

In [807]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PercPublsCite

C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PercPublsCited


In [808]: ALL_PP=pd.read_csv("THEUNI_CITEDPUBLS.csv")

In [809]: ALL_PP.head()

Out[809]:          country countryCode  institution_id  \
         0  United Kingdom         GBR          315091
         1   United States         USA          508092
         2   United States         USA          508021
         3  United Kingdom         GBR          315068
         4   United States         USA          508219

                                                 link  \
         0  {'@href': 'https://api.elsevier.com/analytics/...
         1  {'@href': 'https://api.elsevier.com/analytics/...
         2  {'@href': 'https://api.elsevier.com/analytics/...
```

```
          3  {'@href': 'https://api.elsevier.com/analytics/...
          4  {'@href': 'https://api.elsevier.com/analytics/...

                                              institution_name         metricType  \
          0                               University of Oxford  CitedPublications
          1  Jet Propulsion Laboratory, California Institut...  CitedPublications
          2                 California Institute of Technology  CitedPublications
          3                            University of Cambridge  CitedPublications
          4                                Stanford University  CitedPublications

                2014     2015     2016     2017     2018  percent2014  percent2015  \
          0  10893.0  11679.0  11798.0  11474.0  10570.0    86.555420     85.53537
          1   1514.0   1451.0   1722.0   1588.0   1406.0    79.142710     80.61111
          2   3879.0   3770.0   3914.0   3779.0   3487.0    85.856575     86.72648
          3   9116.0   9238.0   9558.0   9125.0   8418.0    88.060280     86.17537
          4  11156.0  11846.0  11699.0  11642.0  10731.0    87.149445     86.74575

             percent2016  percent2017  percent2018
          0    84.115210     78.56213     70.69761
          1    78.954605     77.38792     63.90909
          2    85.965300     82.74578     71.39640
          3    84.330330     79.49991     71.42372
          4    85.619150     81.79583     72.85627

In [810]: US_PP=ALL_PP[ALL_PP.countryCode=='USA']

In [811]: chuck=[]

          for name in UR_Peer_FWCI.institution_name:
              chuck.append(US_PP[US_PP.institution_name==name])

In [812]: UR_Peer_PP=pd.concat(chuck, ignore_index=True)

In [815]: UR_Peer_PP=UR_Peer_PP[['institution_name','percent2014','percent2015','percent2016',

In [818]: UR_Peer_PP=UR_Peer_PP.drop_duplicates()

In [819]: UR_Peer_PP.shape[0]

Out[819]: 12

In [821]: UR_Peer_PP.loc[:]['UniAbbr']=abb

In [824]: UR_Peer_PP.loc[:]['Mean_%PubCited']=UR_Peer_PP.iloc[:,1:5].mean(axis=1)

In [825]: UR_Peer_PP

Out[825]:                     institution_name  percent2014  percent2015  percent2016  \
          0              Stanford University    87.149445    86.745750    85.619150
          1         Johns Hopkins University    89.002870    87.677800    86.510290
```

```
2                     Duke University    88.075410    86.854250    85.007920
3             Northwestern University    86.777405    86.313380    85.312300
5          University of Pennsylvania    87.413540    85.737160    83.930275
6                   Boston University    86.645850    87.164610    84.995610
7                 New York University    85.079050    83.887920    81.683710
9               University of Chicago    84.766730    82.955670    83.135560
10   Case Western Reserve University    84.712010    83.535610    83.017590
11              Vanderbilt University    88.025280    87.215770    85.106384
12            University of Rochester    83.592450    83.022600    83.044090
13                  Tulane University    82.566730    83.222595    83.673470

    percent2017  percent2018       UniAbbr  Mean_%PubCited
0     81.795830    72.856270      Stanford       85.327544
1     82.894350    73.282555   JohnsHopkins       86.521328
2     81.594154    71.465890       UofPenn       85.382933
3     82.407074    71.779500          Duke       85.202540
5     80.257805    69.561550    UofChicago       84.334695
6     80.863884    71.050520           NYU       84.917488
7     77.177086    66.417710   Northwestern      81.956941
9     78.535040    71.705900    Vanderbilt       82.348250
10    77.285620    67.933495        Boston       82.137707
11    78.452440    68.441520          CWRU       84.699968
12    76.912490    68.948460          UofR       81.642907
13    77.565506    65.554360        Tulane       81.757075
```

```
In [826]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PercPublsCite

C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PercPublsCited


In [828]: UR_Peer_PP=UR_Peer_PP.sort_values(by='Mean_%PubCited', ascending=False)

In [830]: UR_Peer_PP.reset_index(inplace=True, drop=True)

In [882]: C=UR_Peer_PP[['institution_name','Mean_%PubCited']]

In [832]: UR_Peer_PP.to_csv("UofR_Global_Peers_Cited_Publs.csv", index=False)

In [836]: # Top 1 % cited

In [840]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PubTopJournal

C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\PubTopJournalPercentile


In [841]: Top1All=pd.read_csv("THE_ALLUNI_PP.csv")

In [843]: Top1All.columns
```

```
Out[843]: Index(['country', 'countryCode', 'institution_id', 'link', 'institution_name',
                 'metricType', 't1_2014', 't1_2015', 't1_2016', 't1_2017', 't1_2018',
                 't1_percent2014', 't1_percent2015', 't1_percent2016', 't1_percent2017',
                 't1_percent2018', 't5_2014', 't5_2015', 't5_2016', 't5_2017', 't5_2018',
                 't5_percent2014', 't5_percent2015', 't5_percent2016', 't5_percent2017',
                 't5_percent2018', 't10_2014', 't10_2015', 't10_2016', 't10_2017',
                 't10_2018', 't10_percent2014', 't10_percent2015', 't10_percent2016',
                 't10_percent2017', 't10_percent2018', 't25_2014', 't25_2015',
                 't25_2016', 't25_2017', 't25_2018', 't25_percent2014',
                 't25_percent2015', 't25_percent2016', 't25_percent2017',
                 't25_percent2018'],
                dtype='object')
```

```
In [846]: Top1=Top1All[['institution_name','t1_percent2014','t1_percent2015','t1_percent2016',
```

```
In [849]: Top1=Top1.drop_duplicates()
```

```
In [854]: Top1['Total_Top1']=Top1[['institution_name','t1_percent2014','t1_percent2015','t1_pe
```

```
In [855]: Top1.head()
```

```
Out[855]:                                     institution_name  t1_percent2014  \
          0                               University of Oxford        6.250000
          1  Jet Propulsion Laboratory, California Institut...        4.939920
          4                  California Institute of Technology        7.905651
          5                            University of Cambridge        7.298050
          6                                Stanford University        8.733065

             t1_percent2015  t1_percent2016  t1_percent2017  t1_percent2018  Total_Top1
          0        7.244391        7.178117        6.104996        6.456400    6.646781
          1        5.694445        4.605993        3.953229        6.402915    5.119300
          4        6.580714        6.523930        6.254635        6.737181    6.800422
          5        7.159152        7.903886        7.334815        6.474752    7.234131
          6        8.676345        9.068627        8.334686        7.886435    8.539832
```

```
In [856]: chuck=[]

          for name in UR_Peer_FWCI.institution_name:
              chuck.append(Top1[Top1.institution_name==name])
```

```
In [857]: UR_PEER_Top1=pd.concat(chuck, ignore_index=True)
```

```
In [862]: UR_PEER_Top1=UR_PEER_Top1.sort_values(by='Total_Top1', ascending=False)
```

```
In [876]: UR_PEER_Top1.reset_index(inplace=True, drop=True)
```

```
In [881]: D=UR_PEER_Top1[['institution_name','Total_Top1']] # top1%
```

```
In [865]: # top 10%

          Top10=Top1All[['institution_name','t10_percent2014','t10_percent2015','t10_percent20
```

```
In [866]: Top10=Top10.drop_duplicates()
```

```
In [867]: Top10['Total_Top10']=Top10[['institution_name','t10_percent2014','t10_percent2015','
```

```
In [868]: Top10.head()
```

```
Out[868]:                                     institution_name  t10_percent2014  \
          0                                University of Oxford        48.004738
          1  Jet Propulsion Laboratory, California Institut...        30.373833
          4                  California Institute of Technology        44.297565
          5                            University of Cambridge        48.022285
          6                                 Stanford University        50.878800

             t10_percent2015  t10_percent2016  t10_percent2017  t10_percent2018  \
          0        49.169380        47.268753        47.715576        46.048240
          1        33.541668        38.512764        38.251670        35.346176
          4        42.412033        51.662468        47.119900        45.228786
          5        49.646930        50.010223        49.757526        47.258140
          6        51.818962        50.490196        50.584324        48.526580

             Total_Top10
          0    47.641337
          1    35.205222
          4    46.144150
          5    48.939021
          6    50.459772
```

```
In [869]: chuck=[]

          for name in UR_Peer_FWCI.institution_name:
              chuck.append(Top10[Top10.institution_name==name])
```

```
In [870]: UR_PEER_Top10=pd.concat(chuck, ignore_index=True)
```

```
In [873]: UR_PEER_Top10=UR_PEER_Top10.sort_values(by='Total_Top10', ascending=False)
```

```
In [874]: UR_PEER_Top10.reset_index(inplace=True, drop=True)
```

```
In [880]: E=UR_PEER_Top10[['institution_name','Total_Top10']]
```

```
In [889]: A=A.drop_duplicates()
```

```
In [895]: part1=A.join(C.set_index('institution_name'), on='institution_name')
```

```
In [896]: part2=part1.join(D.set_index('institution_name'), on='institution_name')
```

```
In [897]: part3=part2.join(E.set_index('institution_name'), on='institution_name')
```

```
In [898]: part3
```

```
Out[898]:                  institution_name  Total  Mean_%PubCited  Total_Top1  \
          0               Stanford University  69083       85.327544    8.539832
          1          Johns Hopkins University  66009       86.521328    5.689941
          2                   Duke University  45111       85.382933    6.461731
          3           Northwestern University  40315       85.202540    7.651071
          5         University of Pennsylvania  58573       84.334695    6.827791
          6                 Boston University  28873       84.917488    6.607170
          7               New York University  50734       81.956941    5.585733
          9             University of Chicago  44095       82.348250    7.156997
          10  Case Western Reserve University  22234       82.137707    4.582277
          11            Vanderbilt University  31056       84.699968    5.699216
          12          University of Rochester  18132       81.642907    4.659141
          13                Tulane University   9021       81.757075    4.564512

              Total_Top10
          0     50.459772
          1     43.892943
          2     46.996039
          3     48.214202
          5     45.489412
          6     46.571934
          7     41.123320
          9     49.374273
          10    38.889898
          11    43.224036
          12    41.746732
          13    37.115668
```

```
In [901]: B=UR_Peer_FWCI[['institution_name','AVERAGE_FWCI']]
```

```
In [903]: part4=part3.join(B.set_index('institution_name'), on='institution_name')
```

```
In [904]: part4
```

```
Out[904]:                  institution_name  Total  Mean_%PubCited  Total_Top1  \
          0               Stanford University  69083       85.327544    8.539832
          1          Johns Hopkins University  66009       86.521328    5.689941
          2                   Duke University  45111       85.382933    6.461731
          3           Northwestern University  40315       85.202540    7.651071
          5         University of Pennsylvania  58573       84.334695    6.827791
          6                 Boston University  28873       84.917488    6.607170
          7               New York University  50734       81.956941    5.585733
          9             University of Chicago  44095       82.348250    7.156997
          10  Case Western Reserve University  22234       82.137707    4.582277
          11            Vanderbilt University  31056       84.699968    5.699216
          12          University of Rochester  18132       81.642907    4.659141
          13                Tulane University   9021       81.757075    4.564512

              Total_Top10  AVERAGE_FWCI
```

```
0     50.459772       2.4008
1     43.892943       2.0071
2     46.996039       1.9947
3     48.214202       1.9904
5     45.489412       1.9863
6     46.571934       1.9637
7     41.123320       1.9356
9     49.374273       1.8937
10    38.889898       1.8657
11    43.224036       1.8476
12    41.746732       1.8020
13    37.115668       1.5315
```

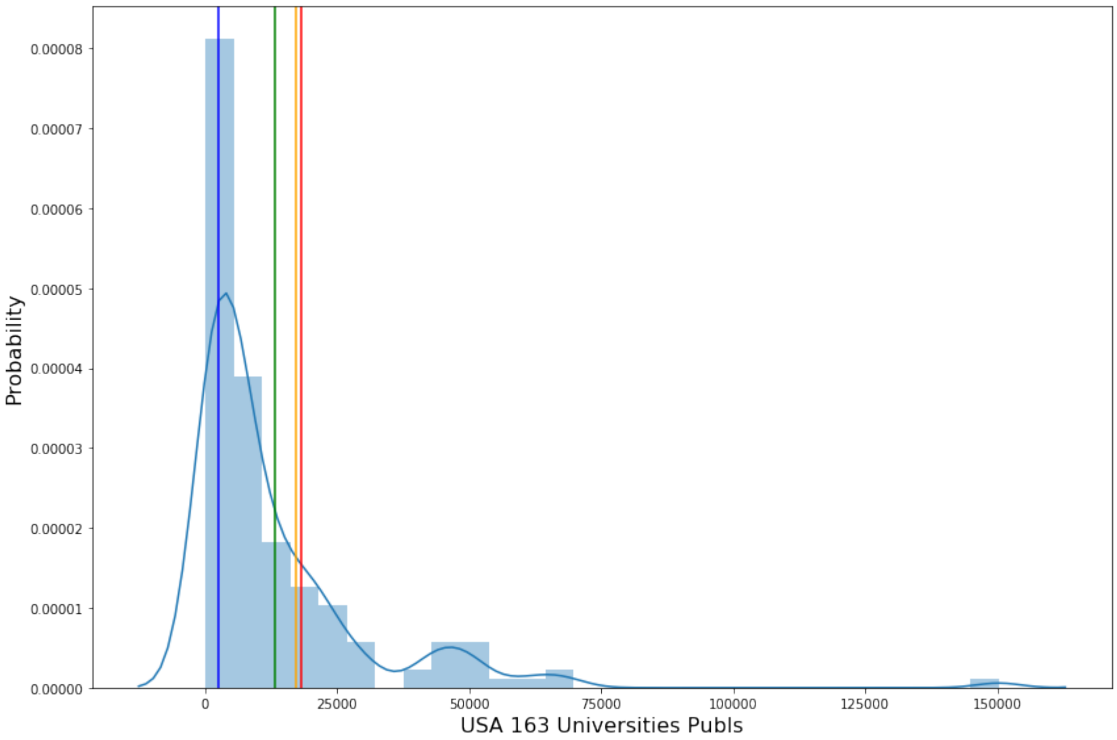
```
In [905]: cd "C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\research_perf
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\OK Files\OUtput Data\research_performance_Profil
```

```
In [906]: part4.to_csv('UR_GloPeers_Research_Performance_Profile.csv', index=False)
```

37 From the distribution plot below, we can see we are above 75% of the other USA Universities in publication 2014-2018

```
In [427]: import pandas as pd
          fig, ax = plt.subplots(figsize=(12,8))
          x = pd.Series(so_data_USA['Total'], name="USA Universities Publs") # 163 universitie
          ax = sns.distplot(x)

          ax.set_xlabel("USA 163 Universities Publs",fontsize=16)
          ax.set_ylabel("Probability",fontsize=16)
          plt.axvline(18132, color='red') # this is where U of R
          plt.axvline(np.mean(so_data_USA['Total']), color='green') # this is the mean, 175882
          plt.axvline(np.percentile(so_data_USA['Total'], 25.0), color='blue') # Q1
          plt.axvline(np.percentile(so_data_USA['Total'], 75.0), color='orange') # Q3 very clo
          #plt.legend()
          plt.tight_layout()
```



```
In [354]: so_data_USA=so_data_USA.reset_index()

In [355]: URpp=so_data_USA[so_data_USA.institution_name=='University of Rochester']
          URpp

Out[355]:             institution_name  2014  2015  2016  2017  2018
          162  University of Rochester  3602  3540  3515  3633  3842

In [356]: URpp=URpp.set_index('institution_name')

In [368]: URpp.agg('sum')

Out[368]: 2014    3602
          2015    3540
          2016    3515
          2017    3633
          2018    3842
          dtype: int64

In [340]: inputdata=pd.DataFrame(data.iloc[:,:6], columns=['2014','2015','2016','2017','2018']

In [341]: inputdata.head()

Out[341]:                          2014  2015  2016  2017  2018
          institution_name
          University of Rochester  3602  3540  3515  3633  3842
```

```
In [342]: inputdata.reset_index(drop=True, inplace=True)
```

```
In [214]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)

          inst_country=[]
          inst_cc=[]
          inst_id=[]
          inst_link=[]
          inst_name=[]
          metricType=[]
          threshold=[]
          t1_value2014=[]
          t1_value2015=[]
          t1_value2016=[]
          t1_value2017=[]
          t1_value2018=[]
          t1_percentage2014=[]
          t1_percentage2015=[]
          t1_percentage2016=[]
          t1_percentage2017=[]
          t1_percentage2018=[]
          t5_value2014=[]
          t5_value2015=[]
          t5_value2016=[]
          t5_value2017=[]
          t5_value2018=[]
          t5_percentage2014=[]
          t5_percentage2015=[]
          t5_percentage2016=[]
          t5_percentage2017=[]
          t5_percentage2018=[]
          t10_value2014=[]
          t10_value2015=[]
          t10_value2016=[]
          t10_value2017=[]
          t10_value2018=[]
          t10_percentage2014=[]
          t10_percentage2015=[]
          t10_percentage2016=[]
          t10_percentage2017=[]
          t10_percentage2018=[]
          t25_value2014=[]
          t25_value2015=[]
```

```
t25_value2016=[]
t25_value2017=[]
t25_value2018=[]
t25_percentage2014=[]
t25_percentage2015=[]
t25_percentage2016=[]
t25_percentage2017=[]
t25_percentage2018=[]



for line in data['University id'][50:75]:
    url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Pu
 #   print(url.format(line))
    resp = requests.get(url.format(line), headers={'Accept':'application/json',
                             'X-ELS-APIKey': "d3794058e2b24417b5dfd0ef8990e2dc"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
#        json.dump(resp.json(), jsonfile)
#    print(parsed)
#    data.update(a_dict)
    result=json.loads(parsed)
    if 'results' in result:
        if len(result['results'])>=1:
            if 'institution' in result['results'][0]:
#                if 'country' in result['results'][0]['institution']:
                inst_country.append(result['results'][0]['institution']['country'])
#            if 'countryCode' in result['results'][0]['institution']:
                inst_cc.append(result['results'][0]['institution']['countryCode'])
#            if 'id' in result['results'][0]['institution']:
                inst_id.append(result['results'][0]['institution']['id'])
#            if 'link' in result['results'][0]['institution']:
                inst_link.append(result['results'][0]['institution']['link'])
#            if 'name' in result['results'][0]['institution']:
                inst_name.append(result['results'][0]['institution']['name'])
            if 'metrics' in result['results'][0]:
#            if len(result['results'][0]['metrics'])>=1:
                if 'metricType' in result['results'][0]['metrics'][0]:
                    metricType.append(result['results'][0]['metrics'][0]['metricType
                if 'values' in result['results'][0]['metrics'][0]:
#                    print(result['results'][0]['metrics'][0]['values'][1]['threshol
                    for i in range(0, len(result['results'][0]['metrics'][0]['values
                        threshold.append(result['results'][0]['metrics'][0]['values'
                        if 'valueByYear' in result['results'][0]['metrics'][0]['valu
#                        if i ==0:
                            if '2014' in result['results'][0]['metrics'][0]['values'
```

```
                                t1_value2014.append(result['results'][0]['metrics'][
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t1_value2015.append(result['results'][0]['metrics'][
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t1_value2016.append(result['results'][0]['metrics'][
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t1_value2017.append(result['results'][0]['metrics'][
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t1_value2018.append(result['results'][0]['metrics'][
#                        if i ==1:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t5_value2014.append(result['results'][0]['metrics'][
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t5_value2015.append(result['results'][0]['metrics'][
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t5_value2016.append(result['results'][0]['metrics'][
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t5_value2017.append(result['results'][0]['metrics'][
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t5_value2018.append(result['results'][0]['metrics'][

#                        if i ==2:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t10_value2014.append(result['results'][0]['metrics']
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t10_value2015.append(result['results'][0]['metrics']
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t10_value2016.append(result['results'][0]['metrics']
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t10_value2017.append(result['results'][0]['metrics']
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t10_value2018.append(result['results'][0]['metrics']

#                        if i ==3:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t25_value2014.append(result['results'][0]['metrics']
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t25_value2015.append(result['results'][0]['metrics']
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t25_value2016.append(result['results'][0]['metrics']
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t25_value2017.append(result['results'][0]['metrics']
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t25_value2018.append(result['results'][0]['metrics']

                        if 'percentageByYear' in result['results'][0]['metrics'][0][
#                        if i ==0:
                            if '2014' in result['results'][0]['metrics'][0]['values']
```

```
                                t1_percentage2014.append(result['results'][0]['metric
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t1_percentage2015.append(result['results'][0]['metric
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t1_percentage2016.append(result['results'][0]['metric
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t1_percentage2017.append(result['results'][0]['metric
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t1_percentage2018.append(result['results'][0]['metric

#                        if i ==1:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2014.append(result['results'][0]['metric
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2015.append(result['results'][0]['metric
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2016.append(result['results'][0]['metric
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2017.append(result['results'][0]['metric
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t5_percentage2018.append(result['results'][0]['metric

#                        if i ==2:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2014.append(result['results'][0]['metri
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2015.append(result['results'][0]['metri
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2016.append(result['results'][0]['metri
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2017.append(result['results'][0]['metri
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t10_percentage2018.append(result['results'][0]['metri

#                        if i ==3:
                            if '2014' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2014.append(result['results'][0]['metri
                            if '2015' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2015.append(result['results'][0]['metri
                            if '2016' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2016.append(result['results'][0]['metri
                            if '2017' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2017.append(result['results'][0]['metri
                            if '2018' in result['results'][0]['metrics'][0]['values']
                                t25_percentage2018.append(result['results'][0]['metri
#                    else:
#                        t1_value2014.append('')
#                        t1_value2015.append('')
#                        t1_value2016.append('')
#                        t1_value2017.append('')
#                        t1_value2018.append('')
#                        t1_percentage2014.append('')
#                        t1_percentage2015.append('')
#                        t1_percentage2016.append('')
#                        t1_percentage2017.append('')
#                        t1_percentage2018.append('')

#                    else:
#                        t1_value2014.append('')
#                        t1_value2015.append('')
#                        t1_value2016.append('')
#                        t1_value2017.append('')
#                        t1_value2018.append('')
#                        t1_percentage2014.append('')
#                        t1_percentage2015.append('')
#                        t1_percentage2016.append('')
#                        t1_percentage2017.append('')
#                        t1_percentage2018.append('')

#                    if 'threshold' in result['results'][0]['metrics'][0]['values']:
#                        threshold.append(result['results'][0]['metrics'][0]['values


s1=pd.Series(inst_country, name='country')
s2=pd.Series(inst_cc, name='countryCode')
s3=pd.Series(inst_id, name='institution_id')
s4=pd.Series(inst_link, name='link')
s5=pd.Series(inst_name, name='institution_name')
s6=pd.Series(metricType, name='metricType')
s7=pd.Series(threshold, name='threshold')
s8=pd.Series(t1_value2014, name='t1_2014')
s9=pd.Series(t1_value2015, name='t1_2015')
s10=pd.Series(t1_value2016, name='t1_2016')
s11=pd.Series(t1_value2017, name='t1_2017')
s12=pd.Series(t1_value2018, name='t1_2018')
s13=pd.Series(t1_percentage2014, name='t1_percent2014')
s14=pd.Series(t1_percentage2015, name='t1_percent2015')
s15=pd.Series(t1_percentage2016, name='t1_percent2016')
s16=pd.Series(t1_percentage2017, name='t1_percent2017')
s17=pd.Series(t1_percentage2018, name='t1_percent2018')
s18=pd.Series(t5_value2014, name='t5_2014')
s19=pd.Series(t5_value2015, name='t5_2015')
s20=pd.Series(t5_value2016, name='t5_2016')
s21=pd.Series(t5_value2017, name='t5_2017')
s22=pd.Series(t5_value2018, name='t5_2018')
s23=pd.Series(t5_percentage2014, name='t5_percent2014')
```

```
          s24=pd.Series(t5_percentage2015, name='t5_percent2015')
          s25=pd.Series(t5_percentage2016, name='t5_percent2016')
          s26=pd.Series(t5_percentage2017, name='t5_percent2017')
          s27=pd.Series(t5_percentage2018, name='t5_percent2018')
          s28=pd.Series(t10_value2014, name='t10_2014')
          s29=pd.Series(t10_value2015, name='t10_2015')
          s30=pd.Series(t10_value2016, name='t10_2016')
          s31=pd.Series(t10_value2017, name='t10_2017')
          s32=pd.Series(t10_value2018, name='t10_2018')
          s33=pd.Series(t10_percentage2014, name='t10_percent2014')
          s34=pd.Series(t10_percentage2015, name='t10_percent2015')
          s35=pd.Series(t10_percentage2016, name='t10_percent2016')
          s36=pd.Series(t10_percentage2017, name='t10_percent2017')
          s37=pd.Series(t10_percentage2018, name='t10_percent2018')
          s38=pd.Series(t25_value2014, name='t25_2014')
          s39=pd.Series(t25_value2015, name='t25_2015')
          s40=pd.Series(t25_value2016, name='t25_2016')
          s41=pd.Series(t25_value2017, name='t25_2017')
          s42=pd.Series(t25_value2018, name='t25_2018')
          s43=pd.Series(t25_percentage2014, name='t25_percent2014')
          s44=pd.Series(t25_percentage2015, name='t25_percent2015')
          s45=pd.Series(t25_percentage2016, name='t25_percent2016')
          s46=pd.Series(t25_percentage2017, name='t25_percent2017')
          s47=pd.Series(t25_percentage2018, name='t25_percent2018')


          DF=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11,s12,s13,s14,s15,s16, s17,s18,s19,s2
                       s28,s29,s30,s31,s32,s33,s34,s35,s36,s37,s38,s39,s40, s41,s42,s43,s44,s4


          DF.to_csv("THE_UNI_PublicationsInTopJournalPercentiles_ALL_3.csv", index=False)  # O



          #print(threshold)

In [ ]:

In [103]: for line in data['University id'][:2]:
              url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=S
           #   print(url.format(line))
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                       'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
              parsed=json.dumps(resp.json(),
                           sort_keys=True,
                           indent=4, separators=(',', ': '))
          #    with open("THE_UNI_ID_METRIC_ALL.json", 'w') as jsonfile:
          #        json.dump(resp.json(), jsonfile)
          #    print(parsed)
          #    data.update(a_dict)
              result=json.loads(parsed)
          print(result['results'])

[{'institution': {'country': 'United States', 'countryCode': 'USA', 'id': 508092, 'link': {'@h
```

```
In [66]: with open("THE_UNI_ID_METRIC_TEST.json") as outputfile:
             out=json.load(outputfile)
```

```
In [67]: out
```

```
Out[67]: {'link': {'@ref': 'self',
           '@href': 'https://api.elsevier.com/analytics/scival/institution/metrics?journalImpa
           '@type': 'application/json'},
          'dataSource': {'sourceName': 'Scopus', 'lastUpdated': '2020-01-01'},
          'results': [{'metrics': [{'metricType': 'ScholarlyOutput',
              'valueByYear': {'2014': 1913,
               '2015': 1800,
               '2016': 2181,
               '2017': 2052,
               '2018': 2200}}],
            'institution': {'link': {'@ref': 'self',
              '@href': 'https://api.elsevier.com/analytics/scival/institution/508092?apiKey=7a
              '@type': 'application/json'},
             'name': 'Jet Propulsion Laboratory, California Institute of Technology',
             'id': 508092,
             'uri': 'Institution/508092',
             'country': 'United States',
             'countryCode': 'USA'}}]}
```

```
In [86]: import requests
         import json
         import pandas as pd
         import numpy as np
         from time import sleep
         sleep(2)

         university_name=[]
         university_id=[]
         country=[]
         countryCode=[]
         df=pd.DataFrame()

         for line in want_3[:4]:
         #    query = "name(school)"
             url= """https://api.elsevier.com/metrics/institution/search?query=name({})&start=
             resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                      'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
             parsed=json.dumps(resp.json(),
                          sort_keys=True,
                          indent=4, separators=(',', ': '))
         #    print(parsed)
         #    data.update(a_dict)
             result=json.loads(parsed)
         #    data=parsed[1]
         #    print(result)
             data=result['results']
             print(data)
         #    if (data[0]['country'] is not None):
```

```
[{'country': 'United Kingdom', 'countryCode': 'GBR', 'id': 315091, 'link': {'@href': 'https://a
[{'country': 'United States', 'countryCode': 'USA', 'id': 508092, 'link': {'@href': 'https://ap
[{'country': 'United Kingdom', 'countryCode': 'GBR', 'id': 315068, 'link': {'@href': 'https://a
[{'country': 'United States', 'countryCode': 'USA', 'id': 508219, 'link': {'@href': 'https://ap
```

```
In [3]: cd "C:\Users\jchen148\THE Rankings\Report to Jane"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane
```

```
In [97]: import requests
         import json
         import pandas as pd
         import numpy as np
         from time import sleep
         sleep(0.1)

         university_name=[]
         university_id=[]
         country=[]
         countryCode=[]
         df=pd.DataFrame()

         for line in want_3[:10]:
         #    query = "name(school)"
             url= "https://api.elsevier.com/metrics/institution/search?query=name({})&start=0&
             resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                  'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
             parsed=json.dumps(resp.json(),
                               sort_keys=True,
                               indent=4, separators=(',', ': '))
             result=json.loads(parsed)
             data=result['results']
             for i in data:
                 if i is not None:
```

```
#    if data[0] is not None:
            countries=i['country']
            unames=i['name']
            uids=i['id']
            codes=i['countryCode']
            if (countries is not None):
                country.append(countries)
            else:
                country.append("")
            if (unames is not None):
                university_name.append(unames)
            else:
                university_name.append("")
            if (uids is not None):
                university_id.append(uids)
            else:
                university_id.append("")
            if (codes is not None):
                countryCode.append(codes)
            else:
                countryCode.append("")
            df=pd.DataFrame({'University Name':university_name, 'University id':unive
            df.to_csv("THE_CountryCode_Result_1202.csv")
```

```
In [98]: import requests
         import json
         import pandas as pd
         import numpy as np
         from time import sleep
         sleep(0.1)

         university_name=[]
         university_id=[]
         country=[]
         countryCode=[]
         df=pd.DataFrame()

         for line in want_3[10:20]:
         #    query = "name(school)"
             url= "https://api.elsevier.com/metrics/institution/search?query=name({})&start=0&
             resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                  'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
             parsed=json.dumps(resp.json(),
                          sort_keys=True,
                          indent=4, separators=(',', ': '))
             result=json.loads(parsed)
```

```
    data=result['results']
    for i in data:
        if i is not None:
#    if data[0] is not None:
            countries=i['country']
            unames=i['name']
            uids=i['id']
            codes=i['countryCode']
            if (countries is not None):
                country.append(countries)
            else:
                country.append("")
            if (unames is not None):
                university_name.append(unames)
            else:
                university_name.append("")
            if (uids is not None):
                university_id.append(uids)
            else:
                university_id.append("")
            if (codes is not None):
                countryCode.append(codes)
            else:
                countryCode.append("")
            df=pd.DataFrame({'University Name':university_name, 'University id':unive
            df.to_csv("THE_CountryCode_Result_1202_2.csv")
```

```
In [100]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(0.1)

          university_name=[]
          university_id=[]
          country=[]
          countryCode=[]
          df=pd.DataFrame()

          for line in want_3[20:30]:
          #    query = "name(school)"
              url= "https://api.elsevier.com/metrics/institution/search?query=name({})&start=0
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                           'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
              parsed=json.dumps(resp.json(),
                               sort_keys=True,
                           indent=4, separators=(',', ': '))
              result=json.loads(parsed)
              data=result['results']
              for i in data:
                  if i is not None:
          #    if data[0] is not None:
                      countries=i['country']
                      unames=i['name']
                      uids=i['id']
                      codes=i['countryCode']
                      if (countries is not None):
                          country.append(countries)
                      else:
                          country.append("")
                      if (unames is not None):
                          university_name.append(unames)
                      else:
                          university_name.append("")
                      if (uids is not None):
                          university_id.append(uids)
                      else:
                          university_id.append("")
                      if (codes is not None):
                          countryCode.append(codes)
                      else:
                          countryCode.append("")
                      df=pd.DataFrame({'University Name':university_name, 'University id':unive
                      df.to_csv("THE_CountryCode_Result_1202_3.csv")
```

```
In [ ]: import requests
        import json
        import pandas as pd
        import numpy as np
        from time import sleep
        sleep(0.1)

        university_name=[]
        university_id=[]
        country=[]
        countryCode=[]
        df=pd.DataFrame()

        for line in want_3[20:30]:
        #    query = "name(school)"
            url= "https://api.elsevier.com/metrics/institution/search?query=name({})&start=0&c
            resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                             'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
```

```
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
    result=json.loads(parsed)
    data=result['results']
    for i in data:
        if i is not None:
#    if data[0] is not None:
            countries=i['country']
            unames=i['name']
            uids=i['id']
            codes=i['countryCode']
            if (countries is not None):
                country.append(countries)
            else:
                country.append("")
            if (unames is not None):
                university_name.append(unames)
            else:
                university_name.append("")
            if (uids is not None):
                university_id.append(uids)
            else:
                university_id.append("")
            if (codes is not None):
                countryCode.append(codes)
            else:
                countryCode.append("")
            df=pd.DataFrame({'University Name':university_name, 'University id':univer
            df.to_csv("THE_CountryCode_Result_1202_3.csv")
```

```
In [ ]: import requests
        import json
        import pandas as pd
        import numpy as np
        from time import sleep
        sleep(0.1)

        university_name=[]
        university_id=[]
        country=[]
        countryCode=[]
        df=pd.DataFrame()

        for line in want_3[30:40]:
        #    query = "name(school)"
            url= "https://api.elsevier.com/metrics/institution/search?query=name({})&start=0&c
            resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                     'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
            parsed=json.dumps(resp.json(),
                         sort_keys=True,
                         indent=4, separators=(',', ': '))
            result=json.loads(parsed)
            data=result['results']
```

```
In [151]: pwd
```

```
Out[151]: 'C:\\Users\\jchen148\\THE Rankings\\Report to Jane'
```

```
In [169]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(3)

          university_name=[]
          university_id=[]
          country=[]
          countryCode=[]
          df=pd.DataFrame()

          for line in want_3[75:]:
              line=re.sub('[^A-Za-z0-9]+',' ', line)
          #    query = "name(school)"
              url= "https://api.elsevier.com/metrics/institution/search?query=name({})&start=0&
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                       'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
          #    try:
              parsed=json.dumps(resp.json(),
                                 sort_keys=True,
                                 indent=4, separators=(',', ': '))
              result=json.loads(parsed)
              data=result['results']
          #    except ValueError:
          #           pass
          #            result=json.loads(parsed)
          #            data=result['results']
              for i in data:
                  if i is None:
                      pass
                  else:
          #                    try:
          #    if data[0] is not None:
                      countries=i['country']
                      unames=i['name']
```

```
            uids=i['id']
            codes=i['countryCode']
            if (countries is not None):
                country.append(countries)
            else:
                country.append("")
            if (unames is not None):
                university_name.append(unames)
            else:
                university_name.append("")
            if (uids is not None):
                university_id.append(uids)
            else:
                university_id.append("")
            if (codes is not None):
                countryCode.append(codes)
            else:
                countryCode.append("")
#                    except (RuntimeError, TypeError, NameError,JSONDecodeError):
#                            pass
            df=pd.DataFrame({'University Name':university_name, 'University id':unive
            df.to_csv("THE_CountryCode_Result_1202_12.csv")
#    except ValueError:
#        continue
```

```
In [153]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(3)

          university_name=[]
          university_id=[]
          country=[]
          countryCode=[]
          df=pd.DataFrame()

          for line in want_3[47:50]:
          #    query = "name(school)"
              url= "https://api.elsevier.com/metrics/institution/search?query=name({})&start=0
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                   'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
              try:
                  parsed=json.dumps(resp.json(),
                                 sort_keys=True,
                                 indent=4, separators=(',', ': '))
                  result=json.loads(parsed)
```

```
        data=result['results']
        for i in data:
            if i is None:
                pass
            else:
                try:
#    if data[0] is not None:
                    countries=i['country']
                    unames=i['name']
                    uids=i['id']
                    codes=i['countryCode']
                    if (countries is not None):
                        country.append(countries)
                    else:
                        country.append("")
                    if (unames is not None):
                        university_name.append(unames)
                    else:
                        university_name.append("")
                    if (uids is not None):
                        university_id.append(uids)
                    else:
                        university_id.append("")
                    if (codes is not None):
                        countryCode.append(codes)
                    else:
                        countryCode.append("")
                except (RuntimeError, TypeError, NameError,JSONDecodeError):
                        pass
                        df=pd.DataFrame({'University Name':university_name, 'Univers
                        df.to_csv("THE_CountryCode_Result_1202_8.csv")
    except ValueError:
        continue
```

```
In [1]: cd "C:\Users\jchen148\THE Rankings\Report to Jane"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane
```

```
In [126]: for line in want_3[38:40]:
              print(re.sub('[^A-Za-z0-9]+',' ', line))
```

```
North Carolina at Chapel Hill
Wageningen University Research
```

```
In [ ]: for line in want_3[38:40]:
            line=re.sub('[^A-Za-z0-9]+',' ', line)
```

```
        #    query = "name(school)"
            url= """https://api.elsevier.com/metrics/institution/search?query=name("{}")&start=
        #    resp = requests.get(url.format(line), headers={'Accept':'application/json',
        #                             'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})

In [135]: pwd

Out[135]: 'C:\\Users\\jchen148\\THE Rankings\\Report to Jane'

In [137]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(3)

          university_name=[]
          university_id=[]
          country=[]
          countryCode=[]
          df=pd.DataFrame()

          for line in want_3[40:50]:
          #    line=re.sub('[^A-Za-z0-9]+',' ', line)
          #    query = "name(school)"
              url= """https://api.elsevier.com/metrics/institution/search?query=name("{}")&sta
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                       'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
              parsed=json.dumps(resp.json(),
                           sort_keys=True,
                           indent=4, separators=(',', ': '))
              result=json.loads(parsed)
              data=result['results']
              for i in data:
                  if i is not None:
          #    if data[0] is not None:
                      countries=i['country']
                      unames=i['name']
                      uids=i['id']
                      codes=i['countryCode']
                      if (countries is not None):
                          country.append(countries)
                      else:
                          country.append("")
                      if (unames is not None):
                          university_name.append(unames)
                      else:
                          university_name.append("")
                      if (uids is not None):
                          university_id.append(uids)
                      else:
                          university_id.append("")
                      if (codes is not None):
                          countryCode.append(codes)
                      else:
                          countryCode.append("")
                      df=pd.DataFrame({'University Name':university_name, 'University id':unive
                      df.to_csv("THE_CountryCode_Result_1202_6.csv")
```

```
In [117]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(3)

          university_name=[]
          university_id=[]
          country=[]
          countryCode=[]
          df=pd.DataFrame()

          #for line in want_3[40:50]:
          #    line=re.sub('[^A-Za-z0-9]+',' ', line)
          #    query = "name(school)"
          #name="University of Rochester"
          url= """https://api.elsevier.com/metrics/institution/search?query=name(University%20
          resp = requests.get(url, headers={'Accept':'application/json',
                                       'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
          parsed=json.dumps(resp.json(),
                           sort_keys=True,
                           indent=4, separators=(',', ': '))
          result=json.loads(parsed)
          data=result['results']
          #print(data)
          for i in data:
              if i is not None:
          #    if data[0] is not None:
                  countries=i['country']
                  unames=i['name']
                  uids=i['id']
                  codes=i['countryCode']
                  if (countries is not None):
                      country.append(countries)
```

```
        else:
            country.append("")
        if (unames is not None):
            university_name.append(unames)
        else:
            university_name.append("")
        if (uids is not None):
            university_id.append(uids)
        else:
            university_id.append("")
        if (codes is not None):
            countryCode.append(codes)
        else:
            countryCode.append("")
        df=pd.DataFrame({'University Name':university_name, 'University id':universi
        df.to_csv("THE_CountryCode_Result_1202_13.csv")
```

```
In [110]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(3)

          university_name=[]
          university_id=[]
          country=[]
          countryCode=[]
          df=pd.DataFrame()

          #for line in want_3[40:50]:
          #    line=re.sub('[^A-Za-z0-9]+',' ', line)
          #    query = "name(school)"
          name="University of Rochester"
          url= """https://api.elsevier.com/metrics/institution/search?query=name("{}")&start=0
          resp = requests.get(url.format(name), headers={'Accept':'application/json',
                                       'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
          parsed=json.dumps(resp.json(),
                            sort_keys=True,
                            indent=4, separators=(',', ': '))
          result=json.loads(parsed)
          data=result['results']
          for i in data:
              if i is not None:
          #    if data[0] is not None:
                  countries=i['country']
                  unames=i['name']
                  uids=i['id']
                  codes=i['countryCode']
                  if (countries is not None):
                      country.append(countries)
                  else:
                      country.append("")
                  if (unames is not None):
                      university_name.append(unames)
                  else:
                      university_name.append("")
                  if (uids is not None):
                      university_id.append(uids)
                  else:
                      university_id.append("")
                  if (codes is not None):
                      countryCode.append(codes)
                  else:
                      countryCode.append("")
                  df=pd.DataFrame({'University Name':university_name, 'University id':universi
                  df.to_csv("THE_CountryCode_Result_1202_13.csv")
```

```
In [ ]: import requests
        import json
        import pandas as pd
        import numpy as np
        from time import sleep
        sleep(2)

        university_name=[]
        university_id=[]
        country=[]
        countryCode=[]

        for line in want_3:
        #    query = "name(school)"
            url= "https://api.elsevier.com/metrics/institution/search?name({})&start=0&count=2
            resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                     'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
            parsed=json.dumps(resp.json(),
                         sort_keys=True,
                         indent=4, separators=(',', ': '))
        #    print(parsed)
```

```
In [11]: cd "C:\Users\jchen148\THE Rankings\Report to Jane"
```

```
C:\Users\jchen148\THE Rankings\Report to Jane
```

```
In [39]: pd.read_csv(r"C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_12
```

```
Out[39]:     Unnamed: 0                                    University Name  \
         0            0                               University of Oxford
         1            1  Jet Propulsion Laboratory, California Institut...
         2            2                 California Institute of Technology
         3            3                            University of Cambridge
         4            4                                Stanford University
         5            5              Massachusetts Institute of Technology
         6            6                               Princeton University
         7            7                                 Harvard University
         8            8                                    Yale University
         9            9                              University of Chicago
         10          10                            Imperial College London

             University id         Country Country Code
         0          315091  United Kingdom          GBR
         1          508092   United States          USA
         2          508021   United States          USA
         3          315068  United Kingdom          GBR
         4          508219   United States          USA
         5          508111   United States          USA
         6          508191   United States          USA
         7          508076   United States          USA
         8          508383   United States          USA
         9          508270   United States          USA
         10         315018  United Kingdom          GBR
```

38 concatenate all files

```
In [22]: link =r"C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_{}.

         for i in range(0, 12):
             i+=1
             print(link.format(i))
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_1.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_2.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_3.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_4.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_5.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_6.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_7.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_8.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_9.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_10.csv
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_11.csv
```

```
C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_12.csv
```

```
In [71]: for i in range(0, 12):
             i+=1
             name='data{}'
             print(name.format(i))
```

```
data1
data2
data3
data4
data5
data6
data7
data8
data9
data10
data11
data12
```

```
In [5]: import pandas as pd
```

```
In [118]: filename='THE_CountryCode_Result_1202_{}.csv'
          for i in range(0, 13):
              i+=1
              print(filename.format(i))
```

```
THE_CountryCode_Result_1202_1.csv
THE_CountryCode_Result_1202_2.csv
THE_CountryCode_Result_1202_3.csv
THE_CountryCode_Result_1202_4.csv
THE_CountryCode_Result_1202_5.csv
THE_CountryCode_Result_1202_6.csv
THE_CountryCode_Result_1202_7.csv
THE_CountryCode_Result_1202_8.csv
THE_CountryCode_Result_1202_9.csv
THE_CountryCode_Result_1202_10.csv
THE_CountryCode_Result_1202_11.csv
THE_CountryCode_Result_1202_12.csv
THE_CountryCode_Result_1202_13.csv
```

```
In [4]: chucks=[]

        filename='THE_CountryCode_Result_1202_{}.csv'
        for i in range(0, 13):
            i+=1
            print(filename.format(i))
        #    chucks.append(filename.format(i))

THE_CountryCode_Result_1202_1.csv
THE_CountryCode_Result_1202_2.csv
THE_CountryCode_Result_1202_3.csv
THE_CountryCode_Result_1202_4.csv
THE_CountryCode_Result_1202_5.csv
THE_CountryCode_Result_1202_6.csv
THE_CountryCode_Result_1202_7.csv
THE_CountryCode_Result_1202_8.csv
THE_CountryCode_Result_1202_9.csv
THE_CountryCode_Result_1202_10.csv
THE_CountryCode_Result_1202_11.csv
THE_CountryCode_Result_1202_12.csv
THE_CountryCode_Result_1202_13.csv
```

```
In [5]: import pandas as pd

        filename='THE_CountryCode_Result_1202_{}.csv'

        chucks=[]
        for i in range(0, 13):
            i+=1
            chucks.append(pd.read_csv(filename.format(i)))

        namedata=pd.concat(chucks, ignore_index=True)

        namedata.head()
```

```
Out[5]:    Unnamed: 0                                    University Name  \
        0           0                               University of Oxford
        1           1  Jet Propulsion Laboratory, California Institut...
        2           2                 California Institute of Technology
        3           3                            University of Cambridge
        4           4                                Stanford University

           University id         Country Country Code
        0         315091  United Kingdom          GBR
        1         508092   United States          USA
        2         508021   United States          USA
        3         315068  United Kingdom          GBR
        4         508219   United States          USA
```

```
In [6]: namedata.reset_index()

        namedata2=namedata[:]
        namedata2.head()

        namedata2=namedata.iloc[:,1:] # delete the first column

        namedata2.head()

Out[6]:                                      University Name  University id  \
        0                               University of Oxford         315091
        1  Jet Propulsion Laboratory, California Institut...         508092
        2                 California Institute of Technology         508021
        3                            University of Cambridge         315068
        4                                Stanford University         508219

                  Country Country Code
        0  United Kingdom          GBR
        1   United States          USA
        2   United States          USA
        3  United Kingdom          GBR
        4   United States          USA

In [137]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(3)

          university_name=[]
          university_id=[]
          country=[]
          countryCode=[]
          df=pd.DataFrame()

          for line in want_3[40:50]:
          #    line=re.sub('[^A-Za-z0-9]+',' ', line)
          #    query = "name(school)"
              url= """https://api.elsevier.com/metrics/institution/search?query=name("{}")&sta
              resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                           'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
              parsed=json.dumps(resp.json(),
                           sort_keys=True,
                           indent=4, separators=(',', ': '))
              result=json.loads(parsed)
              data=result['results']
              for i in data:
                  if i is not None:
          #    if data[0] is not None:
                      countries=i['country']
                      unames=i['name']
                      uids=i['id']
                      codes=i['countryCode']
                      if (countries is not None):
                          country.append(countries)
                      else:
                          country.append("")
                      if (unames is not None):
                          university_name.append(unames)
                      else:
                          university_name.append("")
                      if (uids is not None):
                          university_id.append(uids)
                      else:
                          university_id.append("")
                      if (codes is not None):
                          countryCode.append(codes)
                      else:
                          countryCode.append("")
                      df=pd.DataFrame({'University Name':university_name, 'University id':unive
                      df.to_csv("THE_CountryCode_Result_1202_6.csv")
```

```
In [7]: Uidlist=namedata2['University id']
        Uidlist.head()

Out[7]: 0    315091
        1    508092
        2    508021
        3    315068
        4    508219
        Name: University id, dtype: int64

In [8]: import requests
        import requests_oauthlib
        import pandas as pd
        import numpy as np

In [ ]: import time
        time.sleep(2)


        url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citatio


        resp = requests.get(url.format(line), headers={'Accept':'application/json',
                                     'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
        parsed=json.dumps(resp.json(),
                         sort_keys=True,
                         indent=4, separators=(',', ': '))
        result=json.loads(parsed)

In [9]: len(Uidlist)

Out[9]: 1272

In [125]: import requests
          import requests_oauthlib
          import json
          import pandas as pd
          import numpy as np

          import time
          time.sleep(2)

          country=[]
          countryCode=[]
          Uid=[]
          uname=[]
          uri=[]
          metric=[]
          CitationCount2014=[]
          CitationCount2015=[]
          CitationCount2016=[]
          CitationCount2017=[]
          CitationCount2018=[]

          url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citat

          for uid in Uidlist[1270:]:
          #    print(url.format(uid))
              resp = requests.get(url.format(uid), headers={'Accept':'application/json',
                                                'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
              parsed=json.dumps(resp.json(),
                                 sort_keys=True,
                                 indent=4, separators=(',', ': '))
              result=json.loads(parsed)
          #    print(result)
              if 'results' not in result:
                  pass
              else:
                  if list(result['results']) is None:
                      pass
                  else:
          #         if list(result['results'])[0] is None:
          #             pass
          #        else:
          #        data=result['results']
                      if len(list(result['results']))<1:
                         pass
                      else:
                          if 'institution' not in list(result['results'])[0]:
                              pass
                          else:
                              if 'country' in result['results'][0]['institution']:
                                  country.append(result['results'][0]['institution']['country'
                              else:
                                  country.append("")
                              if 'countryCode' in result['results'][0]['institution']:
                                  countryCode.append(result['results'][0]['institution']['coun
                              else:
                                  countryCode.append("")
                              if 'id' in result['results'][0]['institution']:
                                  Uid.append(result['results'][0]['institution']['id'])
                              else:
                                  Uid.append("")
                              if 'name' in result['results'][0]['institution']:
                                  uname.append(result['results'][0]['institution']['name'])
                              else:
                                  uname.append("")
                              if 'uri' in result['results'][0]:
                                  uri.append(result['results'][0]['institution']['uri'])
                              else:
                                  uri.append("")
                          if 'metrics' not in result['results'][0]:
                              pass
                          else:
                              if 'metricType' not in result['results'][0]['metrics'][0]:
                                  pass
                              else:
                                  metric.append(result['results'][0]['metrics'][0]['metricType
                                  if 'valueByYear' in result['results'][0]['metrics'][0]:
                                      if '2014' in result['results'][0]['metrics'][0]['valueBy
                                          CitationCount2014.append(result['results'][0]['metri
                                      else:
                                          CitationCount2014.append("")
                                      if '2015' in result['results'][0]['metrics'][0]['valueBy
                                          CitationCount2015.append(result['results'][0]['metri
                                      else:
                                          CitationCount2015.append("")
                                      if '2016' in result['results'][0]['metrics'][0]['valueBy
                                          CitationCount2016.append(result['results'][0]['metri
                                      else:
                                          CitationCount2016.append("")
                                      if '2017' in result['results'][0]['metrics'][0]['valueBy
                                          CitationCount2017.append(result['results'][0]['metri
                                      else:
                                          CitationCount2017.append("")
                                      if '2018' in result['results'][0]['metrics'][0]['valueBy
                                          CitationCount2018.append(result['results'][0]['metri
                                      else:
                                          CitationCount2018.append("")
                                  else:
                                      CitationCount2014.append("")
                                      CitationCount2015.append("")
                                      CitationCount2016.append("")
                                      CitationCount2017.append("")
                                      CitationCount2018.append("")
          #            else:
          #                metric.append("")

          s1=pd.Series(country, name='Country')
          s2=pd.Series(countryCode, name='CountryCode')
          s3=pd.Series(Uid, name='Uid')
          s4=pd.Series(uname, name='UniversityName')
          s5=pd.Series(uri, name='uri')
          s6=pd.Series(metric, name='metric')
          s7=pd.Series(CitationCount2014, name='Citation2014')
          s8=pd.Series(CitationCount2015, name='Citation2015')
          s9=pd.Series(CitationCount2016, name='Citation2016')
          s10=pd.Series(CitationCount2017, name='Citation2017')
          s11=pd.Series(CitationCount2018, name='Citation2018')

          Times_df=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11], axis=1)
          Times_df.to_csv("Times_11.csv",index=False)
          #    df=pd.DataFrame(pd.DataFrame(result['results'][0]['metrics']))
          #    df.to_csv("1213_THE.csv", index=False)
```

39 Save data dictionary

```
In [38]: import requests
         import requests_oauthlib
         import json
         import pandas as pd
         import numpy as np

         import time
         time.sleep(2)

         url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citati
         for uid in Uidlist[:5]:
         #    print(url.format(uid))
             resp = requests.get(url.format(uid), headers={'Accept':'application/json',
                                          'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
         #    parsed=json.dumps(resp.json(),
         #                 sort_keys=True,
         #                 indent=4, separators=(',', ': '))
         #    print(parsed)
             #result=json.loads(parsed)
         with open("Uni_Metric_Data_Dictionary_Test4.json", 'w') as jsonfile:
             json.dump(resp.json(),
                              sort_keys=True,
                              indent=4, separators=(',', ': '), fp=jsonfile)
```

```
In [ ]: import requests
        import requests_oauthlib
        import json
        import pandas as pd
        import numpy as np

        import time
        time.sleep(2)

        url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citation

        for uid in Uidlist[:2]:
        #    print(url.format(uid))
            resp = requests.get(url.format(uid), headers={'Accept':'application/json',
                                         'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
            parsed=json.dumps(resp.json(),
                             sort_keys=True,
                             indent=4, separators=(',', ': '))
        #    print(parsed)
        #    parsed = json.loads(resp.text)
        #    print(parsed)
            result=json.loads(parsed)
```

```
In [24]: import requests
         import requests_oauthlib
         import json
         import pandas as pd
         import numpy as np

         import time
         time.sleep(2)

         url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citatio
         for uid in Uidlist[25:]:
         #    print(url.format(uid))
             resp = requests.get(url.format(uid), headers={'Accept':'application/json',
                                          'X-ELS-APIKey': "dcfb521197bf15867d12c3c86c46c69b"})
             parsed=json.dumps(resp.json(),
                          sort_keys=True,
                          indent=4, separators=(',', ': '))
         #    print(parsed)
             #result=json.loads(parsed)
         with open("Uni_Metric_Data_Dic_2.json", 'w') as jsonfile:
             json.dump(parsed, jsonfile)

In [125]: import requests
          import requests_oauthlib
          import json
          import pandas as pd
          import numpy as np

          import time
          time.sleep(2)

          country=[]
          countryCode=[]
          Uid=[]
          uname=[]
          uri=[]
          metric=[]
          CitationCount2014=[]
          CitationCount2015=[]
          CitationCount2016=[]
          CitationCount2017=[]
          CitationCount2018=[]

          url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citat

          for uid in Uidlist[1270:]:
          #    print(url.format(uid))
              resp = requests.get(url.format(uid), headers={'Accept':'application/json',
                                           'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
              parsed=json.dumps(resp.json(),
                           sort_keys=True,
                           indent=4, separators=(',', ': '))
              result=json.loads(parsed)
          #    print(result)
              if 'results' not in result:
                  pass
              else:
                  if list(result['results']) is None:
```

```
            pass
        else:
#        if list(result['results'])[0] is None:
#            pass
#        else:
#        data=result['results']
            if len(list(result['results']))<1:
               pass
            else:
                if 'institution' not in list(result['results'])[0]:
                    pass
                else:
                    if 'country' in result['results'][0]['institution']:
                        country.append(result['results'][0]['institution']['country'
                    else:
                        country.append("")
                    if 'countryCode' in result['results'][0]['institution']:
                        countryCode.append(result['results'][0]['institution']['coun
                    else:
                        countryCode.append("")
                    if 'id' in result['results'][0]['institution']:
                        Uid.append(result['results'][0]['institution']['id'])
                    else:
                        Uid.append("")
                    if 'name' in result['results'][0]['institution']:
                        uname.append(result['results'][0]['institution']['name'])
                    else:
                        uname.append("")
                    if 'uri' in result['results'][0]:
                        uri.append(result['results'][0]['institution']['uri'])
                    else:
                        uri.append("")
                if 'metrics' not in result['results'][0]:
                    pass
                else:
                    if 'metricType' not in result['results'][0]['metrics'][0]:
                        pass
                    else:
                        metric.append(result['results'][0]['metrics'][0]['metricType
                        if 'valueByYear' in result['results'][0]['metrics'][0]:
                            if '2014' in result['results'][0]['metrics'][0]['valueBy
                                CitationCount2014.append(result['results'][0]['metric
                            else:
                                CitationCount2014.append("")
                            if '2015' in result['results'][0]['metrics'][0]['valueBy
                                CitationCount2015.append(result['results'][0]['metric
                            else:
                                CitationCount2015.append("")
                            if '2016' in result['results'][0]['metrics'][0]['valueBy
                                CitationCount2016.append(result['results'][0]['metri
                            else:
                                CitationCount2016.append("")
                            if '2017' in result['results'][0]['metrics'][0]['valueBy
                                CitationCount2017.append(result['results'][0]['metri
                            else:
                                CitationCount2017.append("")
                            if '2018' in result['results'][0]['metrics'][0]['valueBy
                                CitationCount2018.append(result['results'][0]['metri
                            else:
                                CitationCount2018.append("")
                        else:
                            CitationCount2014.append("")
                            CitationCount2015.append("")
                            CitationCount2016.append("")
                            CitationCount2017.append("")
                            CitationCount2018.append("")
#            else:
#                metric.append("")

s1=pd.Series(country, name='Country')
s2=pd.Series(countryCode, name='CountryCode')
s3=pd.Series(Uid, name='Uid')
s4=pd.Series(uname, name='UniversityName')
s5=pd.Series(uri, name='uri')
s6=pd.Series(metric, name='metric')
s7=pd.Series(CitationCount2014, name='Citation2014')
s8=pd.Series(CitationCount2015, name='Citation2015')
s9=pd.Series(CitationCount2016, name='Citation2016')
s10=pd.Series(CitationCount2017, name='Citation2017')
s11=pd.Series(CitationCount2018, name='Citation2018')

Times_df=pd.concat([s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11], axis=1)
Times_df.to_csv("Times_11.csv",index=False)
#    df=pd.DataFrame(pd.DataFrame(result['results'][0]['metrics']))
#    df.to_csv("1213_THE.csv", index=False)
```

40 Combine all subfiles

```
In [126]: filename='Times_{}.csv'

          for i in range(1,12):
              print(filename.format(i))
```

```
Times_1.csv
Times_2.csv
```

```
Times_3.csv
Times_4.csv
Times_5.csv
Times_6.csv
Times_7.csv
Times_8.csv
Times_9.csv
Times_10.csv
Times_11.csv
```

```
In [127]: chuck=[]
          for i in range(1,12):
              chuck.append(pd.read_csv(filename.format(i)))

          total=pd.concat(chuck, ignore_index=True)

          total.head()
```

```
Out[127]:           Country CountryCode     Uid  \
          0  United Kingdom         GBR  315091   
          1   United States         USA  508092   
          2   United States         USA  508021   
          3  United Kingdom         GBR  315068   
          4   United States         USA  508219   

                                               UniversityName  uri         metric  \
          0                              University of Oxford  NaN  CitationCount   
          1  Jet Propulsion Laboratory, California Institut...  NaN  CitationCount   
          2                 California Institute of Technology  NaN  CitationCount   
          3                           University of Cambridge  NaN  CitationCount   
          4                               Stanford University  NaN  CitationCount   

             Citation2014  Citation2015  Citation2016  Citation2017  Citation2018  
          0      355751.0      313129.0      238271.0      149907.0       75747.0  
          1       39797.0       30488.0       32933.0       18670.0        9264.0  
          2      129593.0       97259.0       90365.0       58679.0       29486.0  
          3      260407.0      236169.0      197754.0      127682.0       64830.0  
          4      404346.0      363567.0      282005.0      194136.0       95069.0  
```

```
In [128]: del total['uri']
```

```
In [129]: total.head()

          total.to_csv("THE_Ranked_University_CitationCount_2014_2018.csv", index=False)
```

```
In [130]: total.head()
```

```
Out[130]:           Country CountryCode     Uid  \
          0  United Kingdom         GBR  315091   
```

```
1   United States          USA  508092
2   United States          USA  508021
3  United Kingdom          GBR  315068
4   United States          USA  508219

                                      UniversityName         metric  \
0                               University of Oxford  CitationCount
1  Jet Propulsion Laboratory, California Institut...  CitationCount
2                California Institute of Technology  CitationCount
3                          University of Cambridge  CitationCount
4                              Stanford University  CitationCount

   Citation2014  Citation2015  Citation2016  Citation2017  Citation2018
0      355751.0      313129.0      238271.0      149907.0       75747.0
1       39797.0       30488.0       32933.0       18670.0        9264.0
2      129593.0       97259.0       90365.0       58679.0       29486.0
3      260407.0      236169.0      197754.0      127682.0       64830.0
4      404346.0      363567.0      282005.0      194136.0       95069.0
```

```
In [132]: ranked=total.sort_values(by='Citation2018', ascending=False)


          ranked.to_csv("THE_Ranked_Universites_CitationCounts_2014_2018.csv", index=False)
```

```
In [135]: ranked=ranked.drop_duplicates()
          ranked.to_csv("Updated_THE_Ranked_Universites_CitationCounts_2014_2018.csv", index=Fa
```

```
In [97]: url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citati

         for uid in Uidlist[:1]:
         #    print(url.format(uid))
             resp = requests.get(url.format(uid), headers={'Accept':'application/json',
                                          'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
             parsed=json.dumps(resp.json(),
                          sort_keys=True,
                          indent=4, separators=(',', ': '))
             result=json.loads(parsed)
             print(result['results'][0])
```

```
{'institution': {'country': 'United Kingdom', 'countryCode': 'GBR', 'id': 315091, 'link': {'@hr
```

```
In [4]: link =r"C:\Users\jchen148\THE Rankings\Report to Jane\THE_CountryCode_Result_1202_{}.cs

        for i in range(0, 12):
            i+=1
        #    print(link.format(i))
            name = 'data{}'
            want = name.format(i)
```

```
    want = pd.read_csv(link.format(i))
want
```

```
Out[4]:       Unnamed: 0                                     University Name  \
        0              0                 The American University of Paris
        1              1                     Vrije Universiteit Amsterdam
        2              2                          Pompeu Fabra University
        3              3                            Trinity College Dublin
        4              4                          University of Liverpool
        5              5                  Hong Kong Polytechnic University
        6              6                University of Alabama at Birmingham
        7              7                        University of East Anglia
        8              8                           University of Canberra
        9              9                                Aalborg University
        10            10                          University of Barcelona
        11            11               Autonomous University of Barcelona
        12            12                             University of Bergen
        13            13                              Brandeis University
        14            14                            University of Calgary
        15            15                        Copenhagen Business School
        16            16                             University of Dundee
        17            17                      Griffith University Queensland
        18            18                      Hebrew University of Jerusalem
        19            19                          University of Hohenheim
        20            20                                Howard University
        21            21                               University of Iowa
        22            22                    James Cook University Queensland
        23            23                        King Abdulaziz University
        24            24                           University of Konstanz
        25            25                         University of Luxembourg
        26            26                             Macquarie University
        27            27             University of Massachusetts Dartmouth
        28            28                University of Massachusetts Boston
        29            29          University of Massachusetts Medical School
        ...          ...                                              ...
        1114        1114                              University of Fukui
        1115        1115                        Bursa Orhan Gazi University
        1116        1116                                  Gazi University
        1117        1117                             Osmangazi University
        1118        1118                             Gaziantep University
        1119        1119                        Gebze Technical University
        1120        1120                                  Gifu University
        1121        1121               Government College University Lahore
        1122        1122  Iuliu Hatieganu University of Medicine and Pha...
        1123        1123  Grigore T. Popa University of Medicine and Pha...
        1124        1124   Carol Davila University of Medicine and Pharmacy
        1125        1125  University of Medicine and Pharmacy of Tirgu M...
        1126        1126   Victor Babes University of Medicine and Pharmacy
```

```
1127        1127             Guangxi University for Nationalities
1128        1128                 Guangxi University of Technology
1129        1129                               Guangxi University
1130        1130  I. M. Gubkin Russian State University of Oil a...
1131        1131  Ivano-Frankivsk National Technical University ...
1132        1132                                 Gunma University
1133        1133                                Hallym University
1134        1134                             Hashemite University
1135        1135                             University of Havana
1136        1136                                Helwan University
1137        1137                                 Hosei University
1138        1138                               Huaqiao University
1139        1139                              University of Hyogo
1140        1140                               Ibaraki University
1141        1141               Imam Abdulrahman Bin Faisal University
1142        1142                         Istanbul Medipol University
1143        1143       Ivane Javakhishvili Tbilisi State University
```

```
      University id            Country Country Code
0            703235             France          FRA
1            325016        Netherlands          NLD
2            312052              Spain          ESP
3            319006            Ireland          IRL
4            315086     United Kingdom          GBR
5            205004          Hong Kong          HKG
6            508253      United States          USA
7            315072     United Kingdom          GBR
8            201024          Australia          AUS
9            310001            Denmark          DNK
10           312046              Spain          ESP
11           312045              Spain          ESP
12           326006             Norway          NOR
13           508015      United States          USA
14           501037             Canada          CAN
15           310002            Denmark          DNK
16           315070     United Kingdom          GBR
17           201011          Australia          AUS
18           403004             Israel          ISR
19           309077            Germany          DEU
20           508079      United States          USA
21           508286      United States          USA
22           201012          Australia          AUS
23           409001       Saudi Arabia          SAU
24           309081            Germany          DEU
25           336001         Luxembourg          LUX
26           201014          Australia          AUS
27           508297      United States          USA
28           508296      United States          USA
```

```
        29           508299       United States          USA
        ...             ...                 ...          ...
        1114         208174               Japan          JPN
        1115         705106              Turkey          TUR
        1116         410022              Turkey          TUR
        1117         410044              Turkey          TUR
        1118         410052              Turkey          TUR
        1119         410024              Turkey          TUR
        1120         208024               Japan          JPN
        1121         214010            Pakistan          PAK
        1122         329015             Romania          ROU
        1123         329007             Romania          ROU
        1124         329003             Romania          ROU
        1125         705035             Romania          ROU
        1126         329025             Romania          ROU
        1127         704848               China          CHN
        1128         703985               China          CHN
        1129         203069               China          CHN
        1130         331030  Russian Federation          RUS
        1131         714884             Ukraine          UKR
        1132         208026               Japan          JPN
        1133         209022         South Korea          KOR
        1134         405002              Jordan          JOR
        1135         503001                Cuba          CUB
        1136         104007               Egypt          EGY
        1137         208035               Japan          JPN
        1138         203097               China          CHN
        1139         208030               Japan          JPN
        1140         208038               Japan          JPN
        1141         703099        Saudi Arabia          SAU
        1142         705124              Turkey          TUR
        1143         204001             Georgia          GEO

        [1144 rows x 5 columns]
```

```
In [5]: data=want.sort_values(by='Country Code')
        data.head()
```

```
Out[5]:       Unnamed: 0                              University Name  University id  \
        291          291           American University of Afghanistan         715769
        189          189              United Arab Emirates University         401002
        285          285        American University of Ras Al Khaimah         709859
        1077        1077  Al Ain University of Science and Technology         700486
        1035        1035                             Amity University         712406

                           Country Country Code
        291            Afghanistan          AFG
        189   United Arab Emirates          ARE
        285   United Arab Emirates          ARE
        1077  United Arab Emirates          ARE
        1035  United Arab Emirates          ARE

In [29]: len(data) # 1144

Out[29]: 1144

In [32]: # want to get the CitationCount for top 300 universities

         want.head(300)

         len(want)

Out[32]: 1144

In [59]: test_data = want[:2]
         test_data = test_data['University id']

         test_data

         df_id = pd.DataFrame({'uid':test_data})

         df_id

Out[59]:       uid
         0  703235
         1  325016

In [60]: for uid in df_id['uid']:
             print(uid)

703235
325016


In [62]: df_id

Out[62]:       uid
         0  703235
         1  325016

In [167]: url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citat

          for uid in df_id['uid']:
          #    query = "name(school)"
          #    url= "https://api.elsevier.com/metrics/institution/search?name({})&start=0&coun

              resp = requests.get(url.format(uid), headers={'Accept':'application/json',
                                   'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
```

```
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    print(parsed)
    result=json.loads(parsed)
#    result=parsed[2]
    data=result['results']
#    print(data[0])
    for i in data:
#        print(i['metrics'][2]) # ScholarlyOutput
#        print(i['metrics'][0]) # CitationCount
#        print(i['metrics'][1]) # CitedPublications
#        print(i['metrics'][3]['impactType'])# impactType
        print(i['metrics'][3]) # CiteScore and PublicationsInTopJournalPercentiles
#        print(i['metrics'][3]['values'])
#        print(i['metrics'][3]['values'][0]['percentageByYear'])
#        print(i['metrics'][3]['values'][0]['valueByYear'])
```

```
{'impactType': 'CiteScore', 'metricType': 'PublicationsInTopJournalPercentiles', 'values': [{'
{'impactType': 'CiteScore', 'metricType': 'PublicationsInTopJournalPercentiles', 'values': [{'
```

```
In [11]: import json
```

```
In [22]: url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citati

         #for uid in df_id['uid']:
         for item in Uidlist[100:]:
         #    query = "name(school)"
         #    url= "https://api.elsevier.com/metrics/institution/search?name({})&start=0&count=

             resp = requests.get(url.format(item), headers={'Accept':'application/json',
                                      'X-ELS-APIKey': "ba88a424c653ea37282b6a4cdf423a1d"})
             parsed=json.dumps(resp.json(),
                          sort_keys=True,
                          indent=4, separators=(',', ': '))
         #    print(parsed)
         #    result=json.loads(parsed)
         with open("Data_Dic_1218_6.txt", "a") as text_file:
             print(parsed, file=text_file)
         #    result=parsed[2]
```

```
In [180]: import requests
          import json
          import pandas as pd
          import numpy as np
          from time import sleep
          sleep(2)
```

```
country=[]
countryCode=[]
universityid=[]
uniname=[]
metricType=[]
percentage2014=[]
percentage2015=[]
percentage2016=[]
percentage2017=[]
percentage2018=[]
value2014=[]
value2015=[]
value2016=[]
value2017=[]
value2018=[]
ScholarlyOutput2014=[]
ScholarlyOutput2015=[]
ScholarlyOutput2016=[]
ScholarlyOutput2017=[]
ScholarlyOutput2018=[]
CitationCount2014=[]
CitationCount2015=[]
CitationCount2016=[]
CitationCount2017=[]
CitationCount2018=[]
CitedPublicationsValue2014=[]
CitedPublicationsValue2015=[]
CitedPublicationsValue2016=[]
CitedPublicationsValue2017=[]
CitedPublicationsValue2018=[]
CitedPublicationspercentage2014=[]
CitedPublicationspercentage2015=[]
CitedPublicationspercentage2016=[]
CitedPublicationspercentage2017=[]
CitedPublicationspercentage2018=[]
impactType=[]
CiteScorepercentage2014=[]
CiteScorepercentage2015=[]
CiteScorepercentage2016=[]
CiteScorepercentage2017=[]
CiteScorepercentage2018=[]
CiteScorevalue2014=[]
CiteScorevalue2015=[]
CiteScorevalue2016=[]
CiteScorevalue2017=[]
CiteScorevalue2018=[]
PublicationsInTopJournalPercentilespercentage2014=[]
PublicationsInTopJournalPercentilespercentage2015=[]
```

```
PublicationsInTopJournalPercentilespercentage2016=[]
PublicationsInTopJournalPercentilespercentage2017=[]
PublicationsInTopJournalPercentilespercentage2018=[]
PublicationsInTopJournalPercentilesvalue2014=[]
PublicationsInTopJournalPercentilesvalue2015=[]
PublicationsInTopJournalPercentilesvalue2016=[]
PublicationsInTopJournalPercentilesvalue2017=[]
PublicationsInTopJournalPercentilesvalue2018=[]

PublicationsInTopJournalPercentByYear2014=[]
PublicationsInTopJournalPercentByYear2015=[]
PublicationsInTopJournalPercentByYear2016=[]
PublicationsInTopJournalPercentByYear2017=[]
PublicationsInTopJournalPercentByYear2018=[]

url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citat

#for uid in df_id['uid']:
for item in inputdata:
#    query = "name(school)"
#    url= "https://api.elsevier.com/metrics/institution/search?name({})&start=0&coun

    resp = requests.get(url.format(item), headers={'Accept':'application/json',
                             'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    print(parsed)
    result=json.loads(parsed)
#    result=parsed[2]
    data=result['results']
#    print(data[0])
    for i in data:
        if i is None:
            pass
        else:
            if i['institution'] is None:
                pass
            else:
                if i['institution']['country'] is not None:
                    country.append(i['institution']['country'])
                else:
                    country.append("")
                if i['institution']['countryCode'] is not None:
                    countryCode.append(i['institution']['countryCode'])
                else:
                    countryCode.append("")
                if i['institution']['id'] is not None:
```

```
        universityid.append(i['institution']['id'])
    else:
        universityid.append("")
    if i['institution']['name'] is not None:
        uniname.append(i['institution']['name'])
    else:
        uniname.append("")
if i['metrics'] is None:
    pass
else:
    if i['metrics'][0] is None:
        pass
    else:
        if i['metrics'][0]['metricType'] is not None:
            metricType.append(i['metrics'][0]['metricType'])
        else:
            metricType.append("")
        if i['metrics'][0]['valueByYear'] is None:
            pass
        else:
            if i['metrics'][0]['valueByYear']['2014'] is not None:
                CitationCount2014.append(i['metrics'][0]['valueByYear'][
            else:
                CitationCount2014.append("")
            if i['metrics'][0]['valueByYear']['2015'] is not None:
                CitationCount2015.append(i['metrics'][0]['valueByYear'][
            else:
                CitationCount2015.append("")
            if i['metrics'][0]['valueByYear']['2016'] is not None:
                CitationCount2016.append(i['metrics'][0]['valueByYear'][
            else:
                CitationCount2016.append("")
            if i['metrics'][0]['valueByYear']['2017'] is not None:
                CitationCount2017.append(i['metrics'][0]['valueByYear'][
            else:
                CitationCount2017.append("")
            if i['metrics'][0]['valueByYear']['2018'] is not None:
                CitationCount2018.append(i['metrics'][0]['valueByYear'][
            else:
                CitationCount2018.append("")
    if i['metrics'][1] is None:
        pass
    else:
        if i['metrics'][1]['metricType'] is not None:
            metricType.append(i['metrics'][1]['metricType'])
        else:
            metricType.append("")
        if i['metrics'][1]['percentageByYear'] is None:
```

```
        pass
    else:
        if i['metrics'][1]['percentageByYear']['2014'] is not None:
            CitedPublicationspercentage2014.append(i['metrics'][1]['
        else:
            CitedPublicationspercentage2014.append("")
        if i['metrics'][1]['percentageByYear']['2015'] is not None:
            CitedPublicationspercentage2015.append(i['metrics'][1]['
        else:
            CitedPublicationspercentage2015.append("")
        if i['metrics'][1]['percentageByYear']['2016'] is not None:
            CitedPublicationspercentage2016.append(i['metrics'][1]['
        else:
            CitedPublicationspercentage2016.append("")
        if i['metrics'][1]['percentageByYear']['2017'] is not None:
            CitedPublicationspercentage2017.append(i['metrics'][1]['
        else:
            CitedPublicationspercentage2017.append("")
        if i['metrics'][1]['percentageByYear']['2018'] is not None:
            CitedPublicationspercentage2018.append(i['metrics'][1]['
        else:
            CitedPublicationspercentage2018.append("")
    if i['metrics'][1]['valueByYear'] is None:
        pass
    else:
        if i['metrics'][1]['valueByYear']['2014'] is not None:
            CitedPublicationsValue2014.append(i['metrics'][1]['value
        else:
            CitedPublicationsValue2014.append("")
        if i['metrics'][1]['valueByYear']['2015'] is not None:
            CitedPublicationsValue2015.append(i['metrics'][1]['value
        else:
            CitedPublicationsValue2015.append("")
        if i['metrics'][1]['valueByYear']['2016'] is not None:
            CitedPublicationsValue2016.append(i['metrics'][1]['value
        else:
            CitedPublicationsValue2016.append("")
        if i['metrics'][1]['valueByYear']['2017'] is not None:
            CitedPublicationsValue2017.append(i['metrics'][1]['value
        else:
            CitedPublicationsValue2017.append("")
        if i['metrics'][1]['valueByYear']['2018'] is not None:
            CitedPublicationsValue2018.append(i['metrics'][1]['value
        else:
            CitedPublicationsValue2018.append("")
if i['metrics'][2] is None:
    pass
else:
```

```
                    if i['metrics'][2]['metricType'] is not None:
                        metricType.append(i['metrics'][2]['metricType'])
#                        ScholarlyOutput2014.append(i['metrics'][2]['valueByYear']['
                    else:
                        metricType.append("")
                    if i['metrics'][2]['valueByYear'] is None:
                        pass
                    else:
                        if i['metrics'][2]['valueByYear']['2014'] is not None:
                            ScholarlyOutput2014.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2014.append("")
                        if i['metrics'][2]['valueByYear']['2015'] is not None:
                            ScholarlyOutput2015.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2015.append("")
                        if i['metrics'][2]['valueByYear']['2016'] is not None:
                            ScholarlyOutput2016.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2016.append("")
                        if i['metrics'][2]['valueByYear']['2017'] is not None:
                            ScholarlyOutput2017.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2017.append("")
                        if i['metrics'][2]['valueByYear']['2018'] is not None:
                            ScholarlyOutput2018.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2018.append("")
                if i['metrics'][3] is None:
                    pass
                else:
                    if i['metrics'][3]['impactType'] is not None:
                        impactType.append(i['metrics'][3]['impactType'])
                    else:
                        impactType.append("")
                    if i['metrics'][3]['metricType'] is not None:
                        metricType.append(i['metrics'][3]['metricType'])
                    else:
                        metricType.append("")
                    if i['metrics'][3]['values'] is None:
                        pass
                    else:
                        if i['metrics'][3]['values'][0]['percentageByYear'] is None:
                            pass
                        else:
                            if i['metrics'][3]['values'][0]['percentageByYear']['2014
                                CiteScorepercentage2014.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2014.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2015
                                CiteScorepercentage2015.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2015.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2016
                                CiteScorepercentage2016.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2016.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2017
                                CiteScorepercentage2017.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2017.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2018
                                CiteScorepercentage2018.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2018.append("")
                        if i['metrics'][3]['values'][0]['percentageByYear'] is None:
                            pass
                        else:
                            if i['metrics'][3]['values'][0]['valueByYear']['2014'] i
                                CiteScorevalue2014.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2014.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2015'] i
                                CiteScorevalue2015.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2015.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2016'] i
                                CiteScorevalue2016.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2016.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2017'] i
                                CiteScorevalue2017.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2017.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2018'] i
                                CiteScorevalue2018.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2018.append("")

testfile= pd.DataFrame({'country': country, 'countryCode': countryCode, 'universityi
                       'uniname':uniname, 'CitationCount2014':CitationCount2014,
                       'CitationCount2015':CitationCount2015, 'CitationCount2016':Ci
                       'CitationCount2017':CitationCount2017, 'CitationCount2018':Ci
                        'CitedPublicationspercentage2014':CitedPublicationspercentag
                        'CitedPublicationspercentage2015':CitedPublicationspercentag
                        'CitedPublicationspercentage2016':CitedPublicationspercentag
```

```
                                  'CitedPublicationspercentage2017':CitedPublicationspercentage
                                  'CitedPublicationspercentage2018':CitedPublicationspercentage
                                  'CitedPublicationsValue2014':CitedPublicationsValue2014,
                                  'CitedPublicationsValue2015':CitedPublicationsValue2015,
                                  'CitedPublicationsValue2016':CitedPublicationsValue2016,
                                  'CitedPublicationsValue2017':CitedPublicationsValue2017,
                                  'CitedPublicationsValue2018':CitedPublicationsValue2018,
                                  'ScholarlyOutput2014':ScholarlyOutput2014, 'ScholarlyOutput20
                                  'ScholarlyOutput2016': ScholarlyOutput2016, 'ScholarlyOutput2
                                  'ScholarlyOutput2018':ScholarlyOutput2018,
                                  'CiteScorepercentage2014':CiteScorepercentage2014,
                                  'CiteScorepercentage2015':CiteScorepercentage2015,
                                  'CiteScorepercentage2016':CiteScorepercentage2016,
                                  'CiteScorepercentage2017':CiteScorepercentage2017,
                                  'CiteScorepercentage2018':CiteScorepercentage2018,
                                  'CiteScorevalue2014':CiteScorevalue2014,
                                  'CiteScorevalue2015':CiteScorevalue2015,
                                  'CiteScorevalue2016':CiteScorevalue2016,
                                  'CiteScorevalue2017':CiteScorevalue2017,
                                  'CiteScorevalue2018':CiteScorevalue2018})

          testfile.to_csv("testfile_01.csv", index=False)

          #    data_dict = data[0]['institution']
          #    data_dict_2 = data[0]['institution']
          #    df_file_2=pd.DataFrame(data_dict_2)
          #    df_file_2.to_csv("File_3.csv", index=False)
          #    data_df=pd.DataFrame(data=data_dict.value())
          #    data_df.to_csv("File.csv", index=False)
          #    print(data[0]['institution']['name'])
          #    print(data[0]) # get 'MetricsType'
          #    inst=data[0]['institution']
          #    metrics=data[0]['metrics']
          #    df_test = pd.DataFrame({'institution':inst, 'metrics':metrics})
          #    df_test.to_csv("Test_Inst.csv", index=False)
          #    df=pd.DataFrame(data[0]['metrics'][0])
          #    df.to_csv("Test_MetricsType.csv", index=False)
          #    metrics=result[1]['metrics']

          #    print(data)
          #    print(data)
          #    df=pd.DataFrame(parsed)
          #    df.to_csv("Test_DataFrame.csv", index=False)

In [141]: import requests
          import json
          import pandas as pd
          import numpy as np
```

```
from time import sleep
sleep(2)

country=[]
countryCode=[]
universityid=[]
uniname=[]
metricType=[]
percentage2014=[]
percentage2015=[]
percentage2016=[]
percentage2017=[]
percentage2018=[]
value2014=[]
value2015=[]
value2016=[]
value2017=[]
value2018=[]
ScholarlyOutput2014=[]
ScholarlyOutput2015=[]
ScholarlyOutput2016=[]
ScholarlyOutput2017=[]
ScholarlyOutput2018=[]
CitationCount2014=[]
CitationCount2015=[]
CitationCount2016=[]
CitationCount2017=[]
CitationCount2018=[]
CitedPublicationsValue2014=[]
CitedPublicationsValue2015=[]
CitedPublicationsValue2016=[]
CitedPublicationsValue2017=[]
CitedPublicationsValue2018=[]
CitedPublicationspercentage2014=[]
CitedPublicationspercentage2015=[]
CitedPublicationspercentage2016=[]
CitedPublicationspercentage2017=[]
CitedPublicationspercentage2018=[]
impactType=[]
CiteScorepercentage2014=[]
CiteScorepercentage2015=[]
CiteScorepercentage2016=[]
CiteScorepercentage2017=[]
CiteScorepercentage2018=[]
CiteScorevalue2014=[]
CiteScorevalue2015=[]
CiteScorevalue2016=[]
CiteScorevalue2017=[]
```

```
CiteScorevalue2018=[]
PublicationsInTopJournalPercentilespercentage2014=[]
PublicationsInTopJournalPercentilespercentage2015=[]
PublicationsInTopJournalPercentilespercentage2016=[]
PublicationsInTopJournalPercentilespercentage2017=[]
PublicationsInTopJournalPercentilespercentage2018=[]
PublicationsInTopJournalPercentilesvalue2014=[]
PublicationsInTopJournalPercentilesvalue2015=[]
PublicationsInTopJournalPercentilesvalue2016=[]
PublicationsInTopJournalPercentilesvalue2017=[]
PublicationsInTopJournalPercentilesvalue2018=[]

PublicationsInTopJournalPercentByYear2014=[]
PublicationsInTopJournalPercentByYear2015=[]
PublicationsInTopJournalPercentByYear2016=[]
PublicationsInTopJournalPercentByYear2017=[]
PublicationsInTopJournalPercentByYear2018=[]

url='https://api.elsevier.com/analytics/scival/institution/metrics?metricTypes=Citat

#for uid in df_id['uid']:
for item in Uidlist[100:]:
#    query = "name(school)"
#    url= "https://api.elsevier.com/metrics/institution/search?name({})&start=0&coun

    resp = requests.get(url.format(item), headers={'Accept':'application/json',
                             'X-ELS-APIKey': "a464321ef5063d696ada17f8c159a44c"})
    parsed=json.dumps(resp.json(),
                 sort_keys=True,
                 indent=4, separators=(',', ': '))
#    print(parsed)
    result=json.loads(parsed)
#    result=parsed[2]
    data=result['results']
#    print(data[0])
    for i in data:
        if i is None:
            pass
        else:
            if i['institution'] is None:
                pass
            else:
                if i['institution']['country'] is not None:
                    country.append(i['institution']['country'])
                else:
                    country.append("")
                if i['institution']['countryCode'] is not None:
                    countryCode.append(i['institution']['countryCode'])
                else:
                    countryCode.append("")
                if i['institution']['id'] is not None:
                    universityid.append(i['institution']['id'])
                else:
                    universityid.append("")
                if i['institution']['name'] is not None:
                    uniname.append(i['institution']['name'])
                else:
                    uniname.append("")
            if i['metrics'] is None:
                pass
            else:
                if i['metrics'][0] is None:
                    pass
                else:
                    if i['metrics'][0]['metricType'] is not None:
                        metricType.append(i['metrics'][0]['metricType'])
                    else:
                        metricType.append("")
                    if i['metrics'][0]['valueByYear'] is None:
                        pass
                    else:
                        if i['metrics'][0]['valueByYear']['2014'] is not None:
                            CitationCount2014.append(i['metrics'][0]['valueByYear'][
                        else:
                            CitationCount2014.append("")
                        if i['metrics'][0]['valueByYear']['2015'] is not None:
                            CitationCount2015.append(i['metrics'][0]['valueByYear'][
                        else:
                            CitationCount2015.append("")
                        if i['metrics'][0]['valueByYear']['2016'] is not None:
                            CitationCount2016.append(i['metrics'][0]['valueByYear'][
                        else:
                            CitationCount2016.append("")
                        if i['metrics'][0]['valueByYear']['2017'] is not None:
                            CitationCount2017.append(i['metrics'][0]['valueByYear'][
                        else:
                            CitationCount2017.append("")
                        if i['metrics'][0]['valueByYear']['2018'] is not None:
                            CitationCount2018.append(i['metrics'][0]['valueByYear'][
                        else:
                            CitationCount2018.append("")
                if i['metrics'][1] is None:
                    pass
                else:
                    if i['metrics'][1]['metricType'] is not None:
                        metricType.append(i['metrics'][1]['metricType'])
```

```
else:
    metricType.append("")
if i['metrics'][1]['percentageByYear'] is None:
    pass
else:
    if i['metrics'][1]['percentageByYear']['2014'] is not None:
        CitedPublicationspercentage2014.append(i['metrics'][1]['
    else:
        CitedPublicationspercentage2014.append("")
    if i['metrics'][1]['percentageByYear']['2015'] is not None:
        CitedPublicationspercentage2015.append(i['metrics'][1]['
    else:
        CitedPublicationspercentage2015.append("")
    if i['metrics'][1]['percentageByYear']['2016'] is not None:
        CitedPublicationspercentage2016.append(i['metrics'][1]['
    else:
        CitedPublicationspercentage2016.append("")
    if i['metrics'][1]['percentageByYear']['2017'] is not None:
        CitedPublicationspercentage2017.append(i['metrics'][1]['
    else:
        CitedPublicationspercentage2017.append("")
    if i['metrics'][1]['percentageByYear']['2018'] is not None:
        CitedPublicationspercentage2018.append(i['metrics'][1]['
    else:
        CitedPublicationspercentage2018.append("")
if i['metrics'][1]['valueByYear'] is None:
    pass
else:
    if i['metrics'][1]['valueByYear']['2014'] is not None:
        CitedPublicationsValue2014.append(i['metrics'][1]['value
    else:
        CitedPublicationsValue2014.append("")
    if i['metrics'][1]['valueByYear']['2015'] is not None:
        CitedPublicationsValue2015.append(i['metrics'][1]['value
    else:
        CitedPublicationsValue2015.append("")
    if i['metrics'][1]['valueByYear']['2016'] is not None:
        CitedPublicationsValue2016.append(i['metrics'][1]['value
    else:
        CitedPublicationsValue2016.append("")
    if i['metrics'][1]['valueByYear']['2017'] is not None:
        CitedPublicationsValue2017.append(i['metrics'][1]['value
    else:
        CitedPublicationsValue2017.append("")
    if i['metrics'][1]['valueByYear']['2018'] is not None:
        CitedPublicationsValue2018.append(i['metrics'][1]['value
    else:
        CitedPublicationsValue2018.append("")
```

```
                if i['metrics'][2] is None:
                    pass
                else:
                    if i['metrics'][2]['metricType'] is not None:
                        metricType.append(i['metrics'][2]['metricType'])
#                        ScholarlyOutput2014.append(i['metrics'][2]['valueByYear']['
                    else:
                        metricType.append("")
                    if i['metrics'][2]['valueByYear'] is None:
                        pass
                    else:
                        if i['metrics'][2]['valueByYear']['2014'] is not None:
                            ScholarlyOutput2014.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2014.append("")
                        if i['metrics'][2]['valueByYear']['2015'] is not None:
                            ScholarlyOutput2015.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2015.append("")
                        if i['metrics'][2]['valueByYear']['2016'] is not None:
                            ScholarlyOutput2016.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2016.append("")
                        if i['metrics'][2]['valueByYear']['2017'] is not None:
                            ScholarlyOutput2017.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2017.append("")
                        if i['metrics'][2]['valueByYear']['2018'] is not None:
                            ScholarlyOutput2018.append(i['metrics'][2]['valueByYear']
                        else:
                            ScholarlyOutput2018.append("")
                if i['metrics'][3] is None:
                    pass
                else:
                    if i['metrics'][3]['impactType'] is not None:
                        impactType.append(i['metrics'][3]['impactType'])
                    else:
                        impactType.append("")
                    if i['metrics'][3]['metricType'] is not None:
                        metricType.append(i['metrics'][3]['metricType'])
                    else:
                        metricType.append("")
                    if i['metrics'][3]['values'] is None:
                        pass
                    else:
                        if i['metrics'][3]['values'][0]['percentageByYear'] is None:
                            pass
                        else:
                            if i['metrics'][3]['values'][0]['percentageByYear']['2014
                                CiteScorepercentage2014.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2014.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2015
                                CiteScorepercentage2015.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2015.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2016
                                CiteScorepercentage2016.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2016.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2017
                                CiteScorepercentage2017.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2017.append("")
                            if i['metrics'][3]['values'][0]['percentageByYear']['2018
                                CiteScorepercentage2018.append(i['metrics'][3]['valu
                            else:
                                CiteScorepercentage2018.append("")
                        if i['metrics'][3]['values'][0]['percentageByYear'] is None:
                            pass
                        else:
                            if i['metrics'][3]['values'][0]['valueByYear']['2014'] is
                                CiteScorevalue2014.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2014.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2015'] is
                                CiteScorevalue2015.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2015.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2016'] is
                                CiteScorevalue2016.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2016.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2017'] is
                                CiteScorevalue2017.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2017.append("")
                            if i['metrics'][3]['values'][0]['valueByYear']['2018'] is
                                CiteScorevalue2018.append(i['metrics'][3]['values'][
                            else:
                                CiteScorevalue2018.append("")

testfile= pd.DataFrame({'country': country, 'countryCode': countryCode, 'universityi
                       'uniname':uniname, 'CitationCount2014':CitationCount2014,
                       'CitationCount2015':CitationCount2015, 'CitationCount2016':Ci
                       'CitationCount2017':CitationCount2017, 'CitationCount2018':Ci
```

```
                                  'CitedPublicationspercentage2014':CitedPublicationspercentage
                                  'CitedPublicationspercentage2015':CitedPublicationspercentage
                                  'CitedPublicationspercentage2016':CitedPublicationspercentage
                                  'CitedPublicationspercentage2017':CitedPublicationspercentage
                                  'CitedPublicationspercentage2018':CitedPublicationspercentage
                                  'CitedPublicationsValue2014':CitedPublicationsValue2014,
                                  'CitedPublicationsValue2015':CitedPublicationsValue2015,
                                  'CitedPublicationsValue2016':CitedPublicationsValue2016,
                                  'CitedPublicationsValue2017':CitedPublicationsValue2017,
                                  'CitedPublicationsValue2018':CitedPublicationsValue2018,
                                  'ScholarlyOutput2014':ScholarlyOutput2014, 'ScholarlyOutput2
                                  'ScholarlyOutput2016': ScholarlyOutput2016, 'ScholarlyOutput
                                  'ScholarlyOutput2018':ScholarlyOutput2018,
                                  'CiteScorepercentage2014':CiteScorepercentage2014,
                                  'CiteScorepercentage2015':CiteScorepercentage2015,
                                  'CiteScorepercentage2016':CiteScorepercentage2016,
                                  'CiteScorepercentage2017':CiteScorepercentage2017,
                                  'CiteScorepercentage2018':CiteScorepercentage2018,
                                  'CiteScorevalue2014':CiteScorevalue2014,
                                  'CiteScorevalue2015':CiteScorevalue2015,
                                  'CiteScorevalue2016':CiteScorevalue2016,
                                  'CiteScorevalue2017':CiteScorevalue2017,
                                  'CiteScorevalue2018':CiteScorevalue2018})

          testfile.to_csv("1213_THE_4.csv", index=False)

          #    data_dict = data[0]['institution']
          #    data_dict_2 = data[0]['institution']
          #    df_file_2=pd.DataFrame(data_dict_2)
          #    df_file_2.to_csv("File_3.csv", index=False)
          #    data_df=pd.DataFrame(data=data_dict.value())
          #    data_df.to_csv("File.csv", index=False)
          #    print(data[0]['institution']['name'])
          #    print(data[0]) # get 'MetricsType'
          #    inst=data[0]['institution']
          #    metrics=data[0]['metrics']
          #    df_test = pd.DataFrame({'institution':inst, 'metrics':metrics})
          #    df_test.to_csv("Test_Inst.csv", index=False)
          #    df=pd.DataFrame(data[0]['metrics'][0])
          #    df.to_csv("Test_MetricsType.csv", index=False)
          #    metrics=result[1]['metrics']

          #    print(data)
          #    print(data)
          #    df=pd.DataFrame(parsed)
          #    df.to_csv("Test_DataFrame.csv", index=False)

In [143]: filename='1213_THE_{}.csv'
```

```
          for i in range(1,5):
              print(filename.format(i))

1213_THE_1.csv
1213_THE_2.csv
1213_THE_3.csv
1213_THE_4.csv


In [185]: chuck=[]


          filename='1213_THE_{}.csv'

          for i in range(1,5):
              chuck.append(pd.read_csv(filename.format(i)))

          total_df2=pd.concat(chuck, ignore_index=True)

          total_df2.head()

          total_df2.to_csv("Updated_Uni_Metrics.csv", index=False)

In [170]: chuck=[]


          filename='1213_THE_{}.csv'

          for i in range(1,5):
              chuck.append(pd.read_csv(filename.format(i)))

          total_df=pd.concat(chuck, axis=1)

          total_df.head()


          changedtype=lambda x: int(x[:])

In [ ]: total_df.universityid.fillna(0)

In [183]: total_df.to_csv("Updated_THE_Uni_Metrics.csv", index=False)

In [26]: from sklearn.cluster import KMeans

In [11]: import requests
         url = "https://api.elsevier.com/metrics/institution/scopus_id/60027165?apiKey=dcfb5211
         #url = "https://api.elsevier.com/content/abstract/scopus_id/60027165?apiKey=2bbd32fdf
         response = requests.get(url)
         print(response.headers)
```

```
{'allow': 'GET', 'Content-Encoding': 'gzip', 'Content-Type': 'text/html;charset=utf-8', 'Date'
```

```
In [36]: ## read in all the spreadsheets

         import pandas as pd

         First_5 = pd.read_csv(r"C:\Users\jchen148\THE Rankings\THE_Uni_First5.csv", delimiter=
         print(type(First_5))

         Start_6 = pd.read_csv(r"C:\Users\jchen148\THE Rankings\THE_Uni_6.csv", delimiter=",")

         Start_11 = pd.read_csv(r"C:\Users\jchen148\THE Rankings\THE_Uni_11.csv", delimiter=",

         Start_311 = pd.read_csv(r"C:\Users\jchen148\THE Rankings\THE_Uni_311.csv", delimiter=



         combined_df =pd.concat([First_5,Start_6,Start_11,Start_311])
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
In [25]: cd "C:\Users\jchen148\THE Rankings\Json files"
```

```
C:\Users\jchen148\THE Rankings\Json files
```

```
In [27]: import json

         with open("Test_THE_Country", 'w') as fd:
             fd.write(json.dumps(data_loaded, sort_keys=True, indent=4, separators=(',', ': ')
```

```
In [29]: with open("Test_THE_Country", 'r') as fd:
             University_data=json.load(fd)
```

```
In [13]: # University SciVal institution id
         print(u_id)
```

```
['203212', '203166', '706710', '203440', '209064', '207019', '331008', '207104', '217090', '21
```

```
In [14]: # countryCode

         print(country)
```

```
['BWA', 'IND', 'KEN', 'ARE', 'ARE', 'CHN', 'SDN', 'IND', 'CHN', 'IND', 'ARE', 'TWN']
```