Notebook

September 15, 2014

1 Visualize category trees

Module *wikidat.utils.userresolver* retrieves a list of user names for each country in a list of seed countries. Each of these countries is represented by a wikipedia Category. Users which are part of these category or one of its subcategories are associated with that country. Additionally, this module keeps record of the subcategories which belong to each category.

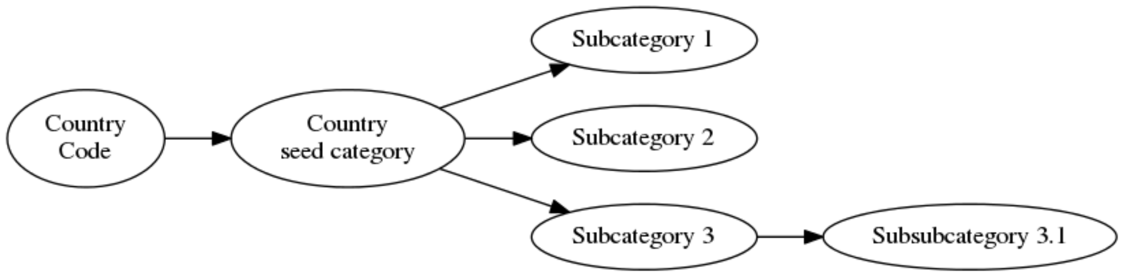
```
In [1]: import unicodedata
        import pydot
        from IPython.display import Image

        import btb.utils.userresolver as usr
```

```
Couldn't import dot_parser, loading of dot files will not be possible.
```

Categories and sub categories can be visualized through a tree graph. The root of this graph tree is the country code, with the first level being all the seed categories associated with that country. The next level contains all of the sub categories of the previous level and so on.

```
In [3]: graph = pydot.Dot('graphname', graph_type='digraph', rankdir='LR')

        graph.add_edge(pydot.Edge('Country\nCode', 'Country\nseed category'))
        graph.add_edge(pydot.Edge('Country\nseed category', 'Subcategory 1'))
        graph.add_edge(pydot.Edge('Country\nseed category', 'Subcategory 2'))
        graph.add_edge(pydot.Edge('Country\nseed category', 'Subcategory 3'))
        graph.add_edge(pydot.Edge('Subcategory 3', 'Subsubcategory 3.1'))

        graphName = 'demoGraph.png'
        graph.write_png(graphName)
        Image(filename=graphName)
```

```
Out[3]:
```



```
In [4]: def edgeStr(name):
            '''
            Format the name of a category for display.
            '''
            name = name.replace('Category:','')
            name = name.replace('Wikipedians in ','')
            name = name.replace('Wikipedians from ','')

            name = name.replace(' Wikipedians','')
            # Make plain ascii
            name = unicodedata.normalize('NFKD', unicode(name)).encode('ascii','ignore')
            return name
```

```
In [4]: def addEdge(graph, fromN, toN):
            '''
            Add an edge from a category to its subcategory
            '''
            if isinstance(toN, int):
                # If node contains number of users, display number of users in node name
                # E.g. Amsterdam_(500)
                fromStr = edgeStr(fromN)
                nodeLabel = fromStr + '\nUsers: ' + str(toN) + ''
                graph.add_node(pydot.Node(fromStr, label=nodeLabel))
            else:
                # Add an edge from X to Y
                fromStr = edgeStr(fromN)
                toStr   = edgeStr(toN)
                graph.add_edge(pydot.Edge(fromStr, toStr))
```

The category and subcategory information is recorded as a list of parent/child tuples. In this list, the parent is the category and each child is one of its subcategories. Additionally, a parent category will have an integer type child; this indicates the number of users in that category.

```
[(DAD, CHILD1),
 (DAD, CHILD2),
 (DAD, CHILD3) ]
```

```
In [6]: def getChildren(dad):
            '''
            Retrieve all the children from a given parent
            '''
            allKids = [ kid for kid in usr.__log__ if kid[0]==dad ]
            searchTerms = []
            for kid in allKids:
                kidName = kid[1]
                searchTerms.append(kidName)
                if not isinstance(kidName, int):
                    if not kidName.startswith('Category:'):
                        searchTerms.append('Category:' + kidName)
            return allKids,searchTerms

        dad = 'Category:Wikipedians in Greece'
        kids,_ = getChildren(dad)
        print 'Children of: ',edgeStr(dad)
        for kid in kids:
            if isinstance(kid[1], int):
                print '  > Number of users:',kid[1],
            else:
                print '  >',edgeStr(kid[1])
```

```
Children of:  Greece
  > Macedonia (Greece)
  > Athens
  > Number of users: 228
```

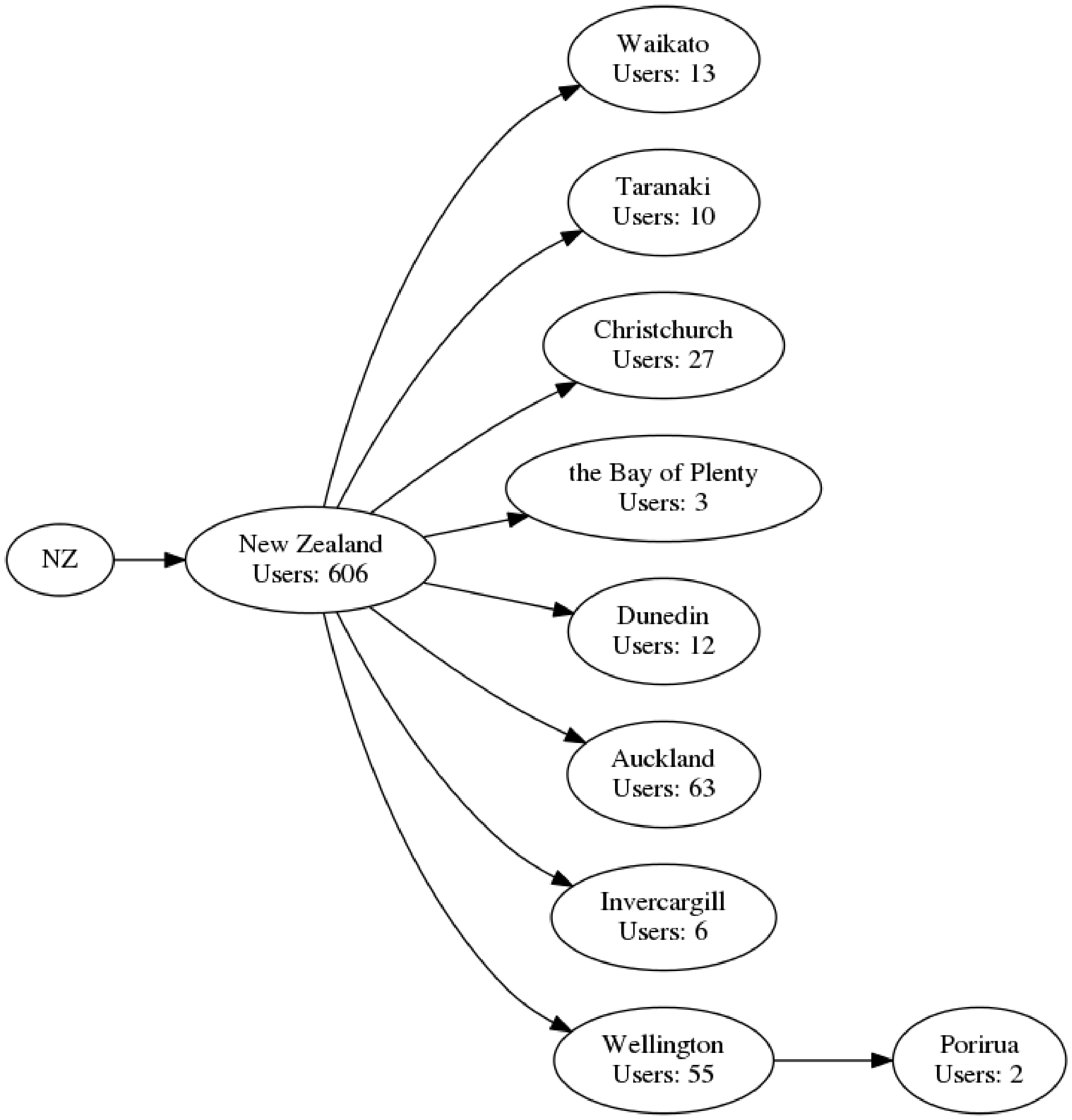
```
In [7]: def getGraphForSeed(seed):
            '''
            Produce a subgraph of all decendents (children and their children and their children...)
            for a given seed country code.
            '''
            searchFor = [ seed ]
            allItems = []
            while len(searchFor)>0:
                seed = searchFor.pop()
                children,searchTerms = getChildren(seed)
                allItems = allItems + children
                searchFor = searchFor + searchTerms
            return allItems
```

```
In [8]: def drawGraphForSeed(seed):
            '''
            Create a graphical representation of all decendents of the given seed country code.
            '''
            allItems = getGraphForSeed(seed)
            graph = pydot.Dot('graphname', graph_type='digraph', rankdir='LR')

            for i in range(len(allItems)):
                addEdge(graph, allItems[i][0], allItems[i][1])

            graphName = 'graph' + seed + '.png'
            graph.write_png(graphName)
            return Image(filename=graphName)
```

A given country code contains a seed category for the whole country, and any number of subcategories for provinces, regions, cities, etc. Each category has a number of users associated with it (displayed in brackets).

```
In [9]: drawGraphForSeed('NZ')
```

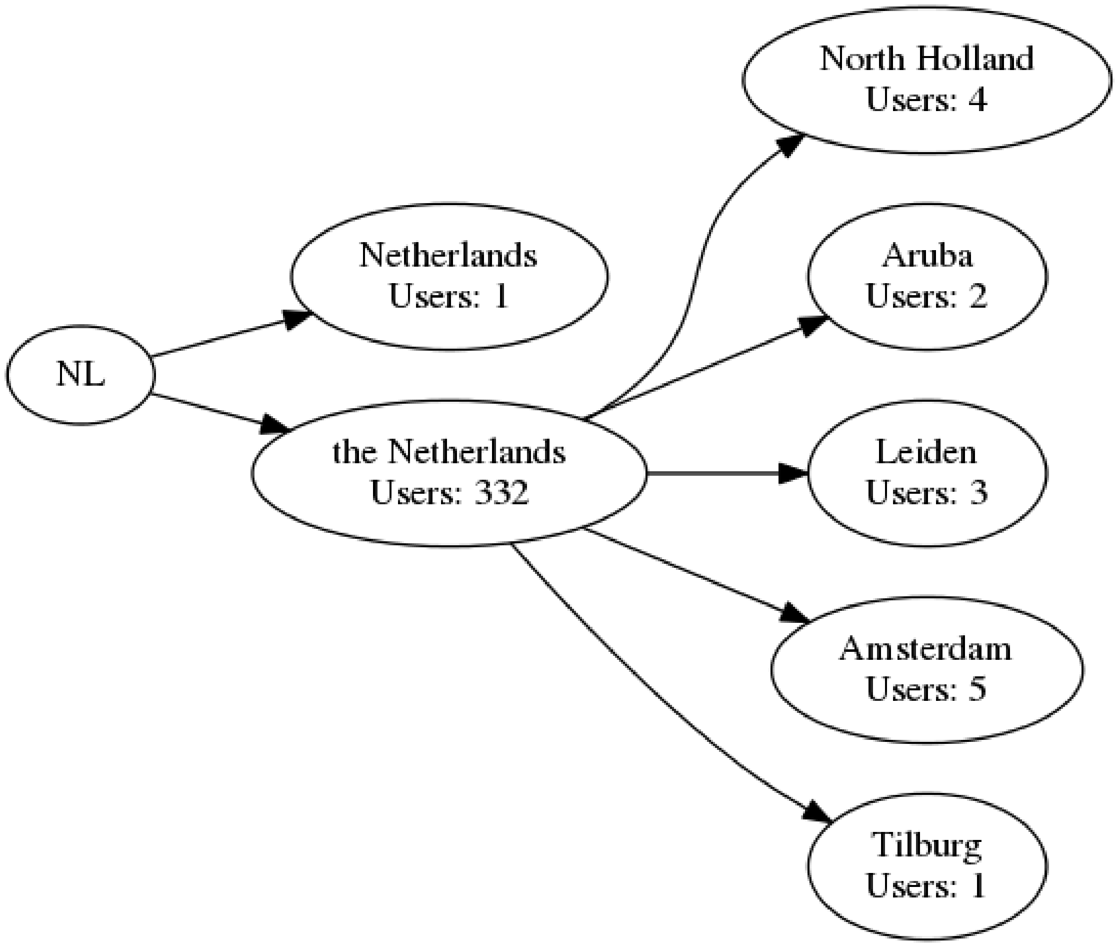
```
Out[9]:
```



Some countries (like the Netherlands) have more than one seed category ('Netherlands' and 'the Netherlands').

```
In [10]: drawGraphForSeed('NL')
```

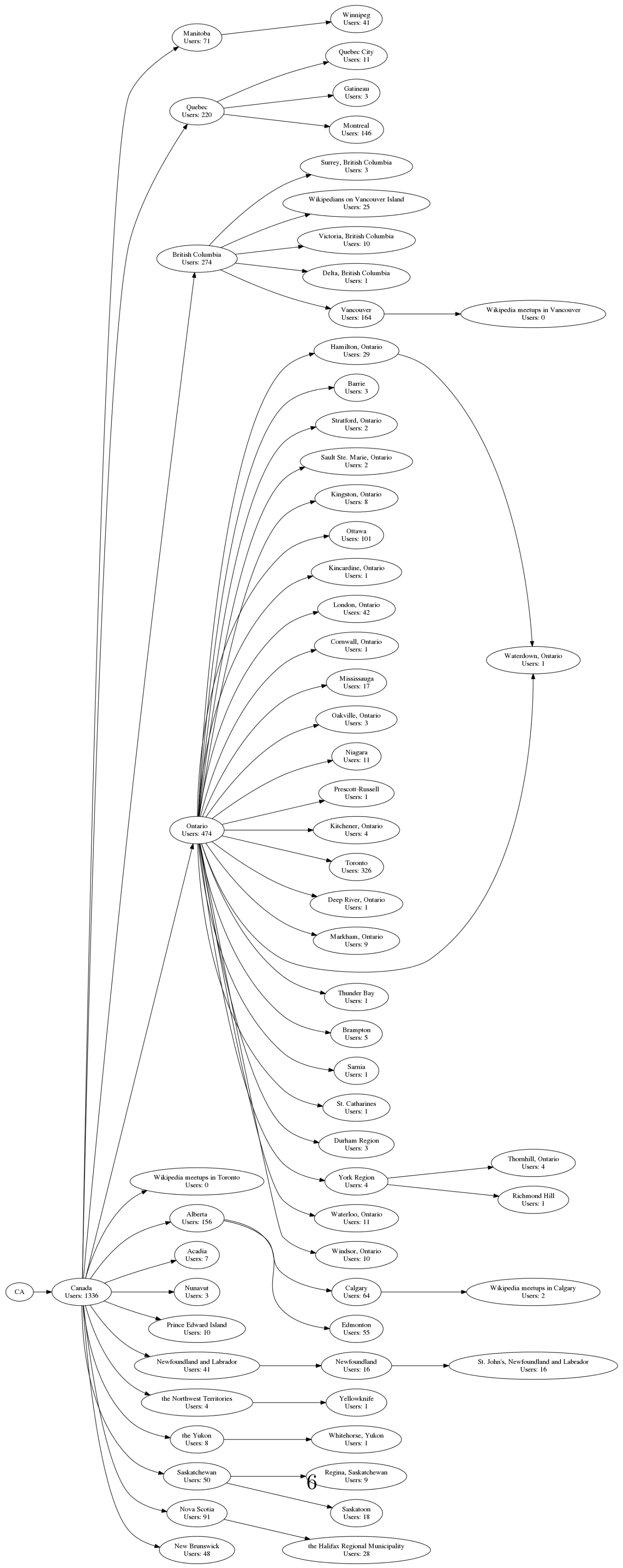
```
Out[10]:
```



The graph structure for Canada is a bit more complicated. Other countries such as USA and India have even larger graphs.

```
In [11]: drawGraphForSeed('CA')
```

```
Out[11]:
```


CA
Canada Users: 1336
Manitoba Users: 71
Winnipeg Users: 41
Quebec Users: 220
Quebec City Users: 11
Gatineau Users: 3
Montreal Users: 146
British Columbia Users: 274
Surrey, British Columbia Users: 3
Wikipedians on Vancouver Island Users: 25
Victoria, British Columbia Users: 10
Delta, British Columbia Users: 1
Vancouver Users: 164
Wikipedia meetups in Vancouver Users: 0
Ontario Users: 474
Hamilton, Ontario Users: 29
Barrie Users: 3
Stratford, Ontario Users: 2
Sault Ste. Marie, Ontario Users: 2
Kingston, Ontario Users: 8
Ottawa Users: 101
Kincardine, Ontario Users: 1
London, Ontario Users: 42
Cornwall, Ontario Users: 1
Mississauga Users: 17
Oakville, Ontario Users: 3
Niagara Users: 11
Prescott-Russell Users: 1
Kitchener, Ontario Users: 4
Toronto Users: 326
Deep River, Ontario Users: 1
Markham, Ontario Users: 9
Waterdown, Ontario Users: 1
Thunder Bay Users: 1
Brampton Users: 5
Sarnia Users: 1
St. Catharines Users: 1
Durham Region Users: 3
York Region Users: 4
Thornhill, Ontario Users: 4
Richmond Hill Users: 1
Waterloo, Ontario Users: 11
Windsor, Ontario Users: 10
Wikipedia meetups in Toronto Users: 0
Alberta Users: 156
Calgary Users: 64
Wikipedia meetups in Calgary Users: 2
Edmonton Users: 55
Acadia Users: 7
Nunavut Users: 3
Prince Edward Island Users: 10
Newfoundland and Labrador Users: 41
Newfoundland Users: 16
St. John's, Newfoundland and Labrador Users: 16
the Northwest Territories Users: 4
Yellowknife Users: 1
the Yukon Users: 8
Whitehorse, Yukon Users: 1
Saskatchewan Users: 50
Regina, Saskatchewan Users: 9
Saskatoon Users: 18
Nova Scotia Users: 91
the Halifax Regional Municipality Users: 28
New Brunswick Users: 48