CS432 Spring 2018

Assignment 2

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Part 1:

1. Write a Python program that extracts 1000 unique links from Twitter. Omit links from the Twitter domain (twitter.com). You might want to take a look at:

Also note that you need to verify that the final target URI (i.e., the one that responds with a 200) is unique. You could have many different shortened URIs for www.cnn.com (t.co, bit.ly, goo.gl, etc.). For example:

To accomplish this task I have utilized two python programs, “GetTwitterURLs.py” and “ModifyURLs.py”. “GetTwitterURLs.py” uses code found on https://stackoverflow.com/questions/42401931/extract-1000-uris-from-twitter-using-tweepy-and-python to extract URLs from tweets, the code was modified to increase the number of URLs extracted and to print them to a file “InitialURLList.txt”. The max number of URLs to be extracted was set to 100000000 and allowed to run overnight, after 8 hours roughly 180000 urls had been extracted. From there we run “ModifiedURLs.py” which finds and removes URLs to twitter and issues a get request allowing redirection to each URL. Any that return a satus_code that doesn’t equal 200 was discarded, those with status_code equal to 200 are written to “ModifiedURLList.txt”, a counter was added to only add 1000 URLs to “ModifiedURLList.txt”

“GetTwitterURLs.py” code snippet:

```
count = 100000000 # moved outside of class definition to avoid getting reset

class StdOutListener(StreamListener):
    def on_data(self, data):

        decoded = json.loads(data)

        global count # get the count
        if count <= 0:
            import sys
            sys.exit()
        else:
            try:
                for url in decoded["entities"]["urls"]:
                    print(count, ':', "%s" % url["expanded_url"] + "\r\n")
                    print("%s" % url["expanded_url"], file=open("InitialURLList.txt", "a"))
                    count -= 1

            except KeyError:
                print(decoded.keys())

    def on_error(self, status):
        print(status)


if __name__ == '__main__':

    l = StdOutListener()
    auth = OAuthHandler(consumer_key, consumer_secret)
    auth.set_access_token(access_token, access_token_secret)
    stream = Stream(auth, l)

    stream.filter(track=['Olympics', 'Football', 'WorldCup', 'Soccer', 'Sports'])
```

“ModifiedURLs.py” code snippet:

```
tString = "https://twitter.com"
inCount = 1
with open(inputFile, "r") as ins:
   urlInput = []
   for line in ins:
       if line[:19].lower() != tString:
           urlInput.append(line)
           #print("Reading input: ", inCount)
           #inCount += 1
                                               .
                                               .
                                               .
for url in urlList:
   print("checking urls for status code and expanded url", urlCounter)
   urlCounter += 1
   try:
       r = requests.get(url, verify=False, allow_redirects=True)
       if int(r.status_code) == 200:
           urlListExpanded.append(r.url)
           goodUrlCounter += 1
           print("url added to list, Status Code: ", r.status_code, "total urls added: ", 
goodUrlCounter)
           print("\t", r.url)
       else:
           badUrlCounter += 1
           print("url not added to list, Status Code: ", r.status_code, "total rejected urls: 
", badUrlCounter)
   except:
       genericErrorInfo()
       badUrlCounter += 1
       print("Error Occurred, URL not Added to List total rejected urls: ", badUrlCounter)
       continue
   urlListExpanded = list(set(urlListExpanded))
   if len(urlListExpanded) == 1000:
       break
```

Part 2:

2. Download the TimeMaps for each of the target URIs. We'll use the ODU Memento Aggregator, so for example:

URI-T = http://memgator.cs.odu.edu/timemap/json/http://www.cs.odu.edu/

Create a histogram* of URIs vs. number of Mementos (as computed from the TimeMaps). For example, 100 URIs with 0 Mementos, 300 URIs with 1 Memento, 400 URIs with 2 Mementos, etc. The x-axis will have the number of mementos, and the y-axis will have the frequency of occurence.

To accomplish this task I used “GetJSONFindMementos.py” and R, the R code can be found in “GenerateMementoHist.txt”. “GetJSONFindMementos.py” opens the file “ModifiedURLList.txt” and for each URL and prepends the URI-T listed above to each URL and retrieves the json information for each URL memento. Any that returns a status_code not equal to 200 is considered to have no mementos. The total number of each unique value of mementos is stored and output to the screen.

“GetJSONFindMementos.py” code snippet:

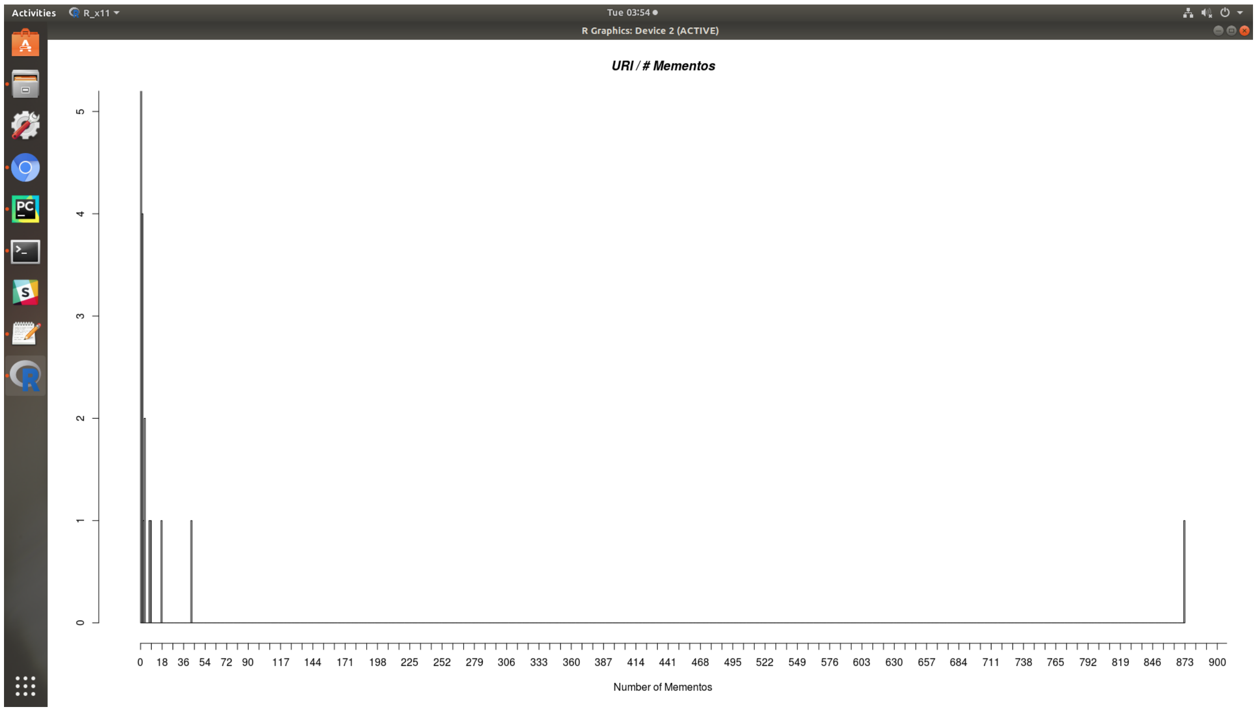
```
for url in urlInput:

    mem = requests.get(urlHead+url)
    if mem.status_code != 200:
        memList.append(0)
        print(urlCounter, ": ", mem.status_code)
        urlCounter += 1

    else:
        jsonFileName = "URL #" + str(urlCounter) + ".json"
        jResponse = json.loads(mem.text)
        jsonList.append(jResponse)
        print(jResponse, file=open(jsonFileName, "w+"))
        print(urlCounter, ": ", mem.status_code, "\n", jResponse)
        urlCounter += 1



for jEntry in jsonList:
    memList.append(len(jEntry['mementos']['list']))
```


Activities
R_x11
Tue 03:54
R Graphics: Device 2 (ACTIVE)
URI / # Mementos
0
1
2
3
4
5
0
18
36
54
72
90
117
144
171
198
225
252
279
306
333
360
387
414
441
468
495
522
549
576
603
630
657
684
711
738
765
792
819
846
873
900
Number of Mementos

Part 3:

3. Estimate the age of each of the 1000 URIs using the "Carbon Date" tool:

For URIs that have > 0 Mementos and an estimated creation date, create a graph with age (in days) on the x-axis and number of mementos on the y-axis.

Not all URIs will have Mementos, and not all URIs will have an estimated creation date. Show how many fall into either categories.

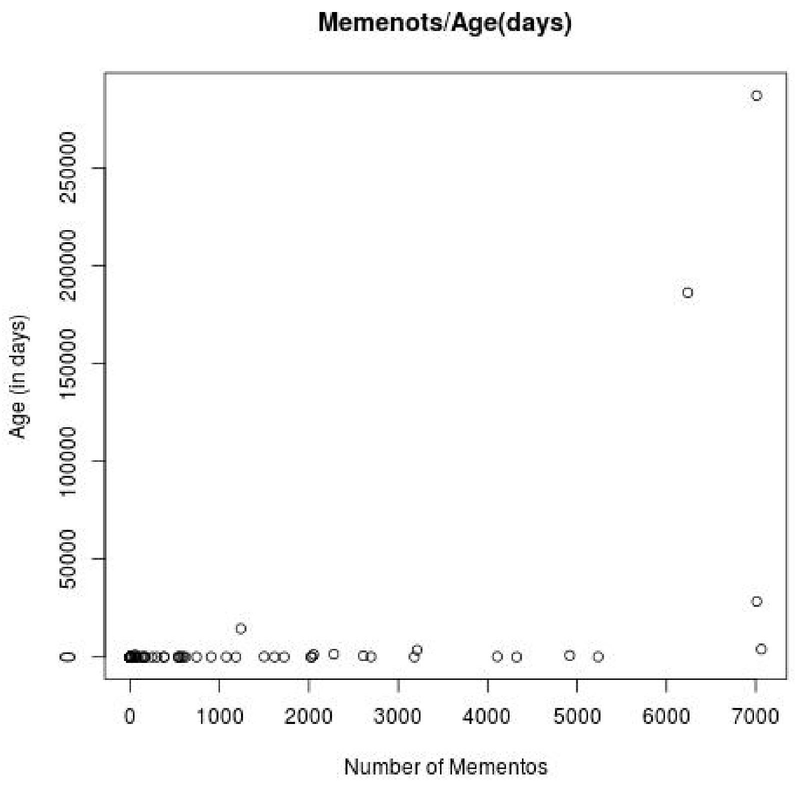
To accomplish the tasks in this part I wrote the program “GetCarbonDate.py”, and utilized docker to run the carbon dating tool from my local host. The “GetCarbonDate.py” program ran though each URL in “ModifiedURLList.txt” and ran two separate request.get() commands,one with the URL prepended with the URL to get the carbon date and another for the memento search, to retrieve the json information for each URL, the json files can be found in the folder “Json Files”, the memento and carbon date json files are separated into two separate folders within the json folder. “GetCarbonDate.py” then calculates the age of each url with a carbon date.

```
for urlNum in range(len(urlInput)):
    carbonDateList.append(getCarbonDate(urlInput[urlNum], urlNum))
    mementoList.append(getMementos(urlInput[urlNum], urlNum))
                                              .
                                              .
                                              .
for x in range(len(urlAge)):
    if urlAge[x] > 1 and mementoList[x] > 0:
        carbonDateWithmemAgeList.append(urlAge[x])
        carbonDateWithMemList.append(mementoList[x])


memAgeList = [[0 for x in range(len(carbonDateWithMemList))] for y in range(2)]

for x in range(len(carbonDateWithMemList)):
    memAgeList[0][x] = carbonDateWithMemList[x]
    memAgeList[1][x] = carbonDateWithmemAgeList[x]
```

The program then outputs two txt files, “AgeMementoList.txt” and “Part3.txt”. “AgeMementoList.txt” is a table composed of the age of any URL (that had an age and mementos) and the number of mementos for the URL, this file is used with the R code found in “GenerateMementoAgeGraph.txt” to generate a graph.



“Part3.txt” simply has the total number of URLs followed by the number without Mementos and the number without a Date, Interestingly when run twice the total without for both changed slightly.

```
Total URIs:          1000
 No Mementos:          852
 No Date Estimation:   460

 Total URIs:           1000
 No Mementos:          866
 No Date Estimation:   463
```