tweet task

December 22, 2020

```
[17]: import tweepy
      import webbrowser
      import time
      import requests
      import base64
      import ison
      import seaborn as sns
      import numpy as np
      import pandas as pd
 [9]: consumer_key = "McleIS9RlMtp6HM6a449tvgYd"
      consumer_secret_key = "qzZ1vpvfftGOMkCSqORaJyLKMg9mnJnPQdVF80eLhno4zib3ws"
 [5]: callback_uri="oob"
 [6]: # Authenticate url
      auth = tweepy.OAuthHandler(consumer_key, consumer_secret, callback_uri)
      redirect_url = auth.get_authorization_url()
      print(redirect_url)
     https://api.twitter.com/oauth/authorize?oauth_token=VhSBjgAAAAABK3xgAAABdoi3xIA
[10]: key_secret = '{}:{}'.format(consumer_key, consumer_secret_key).encode('ascii')
      b64_encoded_key = base64.b64encode(key_secret)
      b64_encoded_key = b64_encoded_key.decode('ascii')
[37]: base_url = 'https://api.twitter.com/'
      auth_url = '{}oauth2/token'.format(base_url)
      auth_headers = {
          'Authorization': 'Basic {}'.format(b64_encoded_key),
          'Content-Type': 'application/x-www-form-urlencoded; charset=UTF-8'
      auth_data = {
          'grant_type': 'client_credentials'
      auth_resp = requests.post(auth_url, headers=auth_headers, data=auth_data)
      print(auth_resp.status_code)
      access_token = auth_resp.json()['access_token']
```

```
[38]: trend headers = {
          'Authorization': 'Bearer {}'.format(access_token)
     }
     trend_params = {
          'id': 20070458,
     }
     trend_url = 'https://api.twitter.com/1.1/trends/place.json'
     trend_resp = requests.get(trend_url, headers=trend_headers, params=trend_params)
[39]: trend_resp
[39]: <Response [200]>
[40]: tweet_data = trend_resp.json()
     print(tweet_data)
     [{'trends': [{'name': '#NationalMathematicsDay', 'url':
     'http://twitter.com/search?q=%23NationalMathematicsDay', 'promoted_content':
     None, 'query': '%23NationalMathematicsDay', 'tweet_volume': None}, {'name':
     '#PanchayatToParliamentBJP', 'url':
     'http://twitter.com/search?q=%23PanchayatToParliamentBJP', 'promoted_content':
     None, 'query': '%23PanchayatToParliamentBJP', 'tweet_volume': 14998}, {'name':
     '#tuesdaymotivations', 'url':
     'http://twitter.com/search?q=%23tuesdaymotivations', 'promoted_content': None,
     'query': '%23tuesdaymotivations', 'tweet_volume': None}, {'name':
     '#SrinivasaRamanujan', 'url':
     'http://twitter.com/search?q=%23SrinivasaRamanujan', 'promoted_content': None,
     'query': '%23SrinivasaRamanujan', 'tweet_volume': None}, {'name':
     '#SaveTodayForFuture', 'url':
     'http://twitter.com/search?q=%23SaveTodayForFuture', 'promoted content': None,
     'query': '%23SaveTodayForFuture', 'tweet_volume': 14832}, {'name': 'Legion of
     Merit', 'url': 'http://twitter.com/search?q=%22Legion+of+Merit%22',
     'promoted_content': None, 'query': '%22Legion+of+Merit%22', 'tweet_volume':
     None}, {'name': 'lee sooman', 'url':
     'http://twitter.com/search?q=%22lee+sooman%22', 'promoted_content': None,
     'query': '%22lee+sooman%22', 'tweet_volume': 20196}, {'name': '
     'url': 'http://twitter.com/search?q=%22%E0%A4%B0%E0%A4%BE%E0%A4%B7%E0%A5%8D%E0%A
     4%9F%E0%A5%8D%E0%A4%B0%E0%A5%80%E0%A4%AF+%E0%A4%97%E0%A4%A3%E0%A4%BF%E0%A4%A4%22
     ', 'promoted content': None, 'query': '%22%E0%A4%B0%E0%A4%BE%E0%A4%B7%E0%A5%8D%E
     0%A4%9F%E0%A5%8D%E0%A4%B0%E0%A5%80%E0%A4%AF+%E0%A4%97%E0%A4%A3%E0%A4%BF%E0%A4%A4
     %22', 'tweet volume': None}, {'name': '
                                                    ', 'url': 'http://twitt
     B5%E0%A4%BE%E0%A4%B8+%E0%A4%B0%E0%A4%BE%E0%A4%AE%E0%A4%BE%E0%A4%A8%E0%A5%81%E0%A
     4%9C%E0%A4%A8%22', 'promoted_content': None, 'query': '%22%E0%A4%B6%E0%A5%8D%E0%
```

```
A4%B0%E0%A5%80%E0%A4%A8%E0%A4%BF%E0%A4%B5%E0%A4%BE%E0%A4%B8+%E0%A4%B0%E0%A4%BE%E
0%A4%AE%E0%A4%BE%E0%A4%A8%E0%A5%81%E0%A4%9C%E0%A4%A8%22', 'tweet volume': None},
{'name': 'US President', 'url':
'http://twitter.com/search?q=%22US+President%22', 'promoted_content': None,
'query': '%22US+President%22', 'tweet volume': 128227}, {'name': 'US-India',
'url': 'http://twitter.com/search?q=US-India', 'promoted_content': None,
'query': 'US-India', 'tweet volume': None}, {'name': 'Infinity', 'url':
'http://twitter.com/search?q=Infinity', 'promoted_content': None, 'query':
'Infinity', 'tweet volume': 26992}, {'name': 'Toronto', 'url':
'http://twitter.com/search?q=Toronto', 'promoted_content': None, 'query':
'Toronto', 'tweet_volume': 38673}, {'name': ' ', 'url': 'http://twitte
r.com/search?q=%22%E0%A4%B6%E0%A5%8D%E0%A4%B0%E0%A5%80+%E0%A4%B9%E0%A4%A8%E0%A5%
81%E0%A4%AE%E0%A4%BE%E0%A4%A8%22', 'promoted_content': None, 'query': '%22%E0%A4
%B6%E0%A5%8D%E0%A4%B0%E0%A5%80+%E0%A4%B9%E0%A4%A8%E0%A5%81%E0%A4%AE%E0%A4%BE%E0%
A4%A8%22', 'tweet_volume': None}, {'name': 'Donald Trump', 'url':
'http://twitter.com/search?q=%22Donald+Trump%22', 'promoted_content': None,
'query': '%22Donald+Trump%22', 'tweet_volume': 223281}, {'name': 'HAPPY BIRTHDAY
SARU', 'url': 'http://twitter.com/search?q=%22HAPPY+BIRTHDAY+SARU%22',
'promoted_content': None, 'query': '%22HAPPY+BIRTHDAY+SARU%22', 'tweet_volume':
None}, {'name': '"Christians"', 'url':
'http://twitter.com/search?q=%22Christians%22', 'promoted content': None,
'query': '%22Christians%22', 'tweet_volume': 24926}, {'name': 'Werner', 'url':
'http://twitter.com/search?q=Werner', 'promoted_content': None, 'query':
'Werner', 'tweet_volume': 65769}, {'name': '#FarmersBeforeCorporations', 'url':
'http://twitter.com/search?q=%23FarmersBeforeCorporations', 'promoted_content':
None, 'query': '%23FarmersBeforeCorporations', 'tweet_volume': 42769}, {'name':
'#FastTrackSSRCase', 'url': 'http://twitter.com/search?q=%23FastTrackSSRCase',
'promoted_content': None, 'query': '%23FastTrackSSRCase', 'tweet_volume':
51402}, {'name': '#tuesdayvibe', 'url':
'http://twitter.com/search?q=%23tuesdayvibe', 'promoted content': None, 'query':
'%23tuesdayvibe', 'tweet_volume': None}, {'name': '#KarimaBaloch', 'url':
'http://twitter.com/search?q=%23KarimaBaloch', 'promoted_content': None,
'query': '%23KarimaBaloch', 'tweet_volume': 10193}, {'name':
'#CoronavirusStrain', 'url': 'http://twitter.com/search?q=%23CoronavirusStrain',
'promoted content': None, 'query': '%23CoronavirusStrain', 'tweet volume':
None}, {'name': '#Gita AGiftToMankind', 'url':
'http://twitter.com/search?q=%23Gita AGiftToMankind', 'promoted content': None,
'query': '%23Gita_AGiftToMankind', 'tweet_volume': 40429}, {'name':
'#TuesdayThoughts', 'url': 'http://twitter.com/search?q=%23TuesdayThoughts',
'promoted_content': None, 'query': '%23TuesdayThoughts', 'tweet_volume': None},
{'name': '#TuesdayFeeling', 'url':
'http://twitter.com/search?q=%23TuesdayFeeling', 'promoted content': None,
'query': '%23TuesdayFeeling', 'tweet_volume': None}, {'name':
            ', 'url': 'http://twitter.com/search?q=%23%E0%A4%B0%E0%A4%B
%A3%E0%A4%BF%E0%A4%A4 %E0%A4%A6%E0%A4%BF%E0%A4%B5%E0%A4%B8', 'promoted_content':
None, 'query': '%23%E0%A4%B0%E0%A4%BE%E0%A4%B7%E0%A5%8D%E0%A4%9F%E0%A5%8D%E0%A4%
B0%E0%A5%80%E0%A4%AF_%E0%A4%97%E0%A4%A3%E0%A4%BF%E0%A4%A4 %E0%A4%A6%E0%A4%BF%E0%
```

```
A4%B5%E0%A4%B8', 'tweet_volume': None}, {'name': '#I_Support_Farmer_Protest',
'url': 'http://twitter.com/search?q=%23I_Support_Farmer_Protest',
'promoted_content': None, 'query': '%23I_Support_Farmer_Protest',
'tweet_volume': None}, {'name': '#maths', 'url':
'http://twitter.com/search?q=%23maths', 'promoted content': None, 'query':
'%23maths', 'tweet_volume': None}, {'name': '#GodMorningTuesday', 'url':
'http://twitter.com/search?q=%23GodMorningTuesday', 'promoted content': None,
'query': '%23GodMorningTuesday', 'tweet_volume': None}, {'name':
'#ModiNaukarAmbaniKa', 'url':
'http://twitter.com/search?q=%23ModiNaukarAmbaniKa', 'promoted_content': None,
'query': '%23ModiNaukarAmbaniKa', 'tweet_volume': 43376}, {'name':
'#tuesdaymorning', 'url': 'http://twitter.com/search?q=%23tuesdaymorning',
'promoted_content': None, 'query': '%23tuesdaymorning', 'tweet_volume': None},
{'name': '#3yearsofsakkapodupoduraja', 'url':
'http://twitter.com/search?q=%233yearsofsakkapodupoduraja', 'promoted_content':
None, 'query': '%233yearsofsakkapodupoduraja', 'tweet_volume': None}, {'name':
'#ProudOfTaylor', 'url': 'http://twitter.com/search?q=%23ProudOfTaylor',
'promoted_content': None, 'query': '%23ProudOfTaylor', 'tweet_volume': 29278},
{'name': '#DDCElections2020', 'url':
'http://twitter.com/search?q=%23DDCElections2020', 'promoted content': None,
'query': '%23DDCE1ections2020', 'tweet volume': None}, {'name': '#
'http://twitter.com/search?q=%23%E0%A4%9C%E0%A4%AF%E0%A4%AD%E0%A5%80%E0%A4%AE',
'promoted_content': None, 'query':
'%23%E0%A4%9C%E0%A4%AF%E0%A4%AD%E0%A5%80%E0%A4%AE', 'tweet_volume': None},
{'name': '#thetop_100', 'url': 'http://twitter.com/search?q=%23thetop_100',
'promoted_content': None, 'query': '%23thetop_100', 'tweet_volume': 142051},
{'name': '#14YearsForRakhi', 'url':
'http://twitter.com/search?q=%2314YearsForRakhi', 'promoted content': None,
'query': '%2314YearsForRakhi', 'tweet_volume': 73909}, {'name': '#CHEWHU',
'url': 'http://twitter.com/search?q=%23CHEWHU', 'promoted_content': None,
'query': '%23CHEWHU', 'tweet_volume': 56929}, {'name': '# _ _ ', 'url': 'h
ttp://twitter.com/search?q=%23%E0%A4%9C%E0%A4%AF_%E0%A4%B6%E0%A5%8D%E0%A4%B0%E0%
A5%80 %E0%A4%B0%E0%A4%BE%E0%A4%AE', 'promoted content': None, 'query': '%23%E0%A
4%9C%E0%A4%AF_%E0%A4%B6%E0%A5%8D%E0%A4%B0%E0%A5%80_%E0%A4%B0%E0%A4%BE%E0%A4%AE',
'tweet volume': None}, {'name': '#nifty50', 'url':
'http://twitter.com/search?q=%23nifty50', 'promoted_content': None, 'query':
'%23nifty50', 'tweet volume': None}, {'name': '#babakadhaba', 'url':
'http://twitter.com/search?q=%23babakadhaba', 'promoted_content': None, 'query':
'%23babakadhaba', 'tweet_volume': None}, {'name': '#Britain', 'url':
'http://twitter.com/search?q=%23Britain', 'promoted_content': None, 'query':
'%23Britain', 'tweet_volume': None}], 'as_of': '2020-12-22T04:52:04Z',
'created_at': '2020-12-20T04:47:29Z', 'locations': [{'name': 'Delhi', 'woeid':
20070458}]}]
```

[41]: type(tweet_data)

[41]: list

```
[42]: len(tweet_data)
[42]: 1
[43]: for i in range(0,10):
        print(tweet_data[0]['trends'][i])
     {'name': '#NationalMathematicsDay', 'url':
     'http://twitter.com/search?q=%23NationalMathematicsDay', 'promoted content':
     None, 'query': '%23NationalMathematicsDay', 'tweet_volume': None}
     {'name': '#PanchayatToParliamentBJP', 'url':
     'http://twitter.com/search?q=%23PanchayatToParliamentBJP', 'promoted_content':
     None, 'query': '%23PanchayatToParliamentBJP', 'tweet_volume': 14998}
     {'name': '#tuesdaymotivations', 'url':
     'http://twitter.com/search?q=%23tuesdaymotivations', 'promoted_content': None,
     'query': '%23tuesdaymotivations', 'tweet_volume': None}
     {'name': '#SrinivasaRamanujan', 'url':
     'http://twitter.com/search?q=%23SrinivasaRamanujan', 'promoted content': None,
     'query': '%23SrinivasaRamanujan', 'tweet_volume': None}
     {'name': '#SaveTodayForFuture', 'url':
     'http://twitter.com/search?q=%23SaveTodayForFuture', 'promoted_content': None,
     'query': '%23SaveTodayForFuture', 'tweet_volume': 14832}
     {'name': 'Legion of Merit', 'url':
     'http://twitter.com/search?q=%22Legion+of+Merit%22', 'promoted content': None,
     'query': '%22Legion+of+Merit%22', 'tweet_volume': None}
     {'name': 'lee sooman', 'url': 'http://twitter.com/search?q=%22lee+sooman%22',
     'promoted_content': None, 'query': '%22lee+sooman%22', 'tweet_volume': 20196}
                      ', 'url': 'http://twitter.com/search?q=%22%E0%A4%B0%E0%A
     {'name': '
     4%BE%E0%A4%B7%E0%A5%8D%E0%A4%9F%E0%A5%8D%E0%A4%B0%E0%A5%80%E0%A4%AF+%E0%A4%97%E0
     %A4%A3%E0%A4%BF%E0%A4%A4%22', 'promoted_content': None, 'query': '%22%E0%A4%B0%E
     0%A4%BE%E0%A4%B7%E0%A5%8D%E0%A4%9F%E0%A5%8D%E0%A4%B0%E0%A5%80%E0%A4%AF+%E0%A4%97
     %E0%A4%A3%E0%A4%BF%E0%A4%A4%22', 'tweet_volume': None}
     {'name': '
                        ', 'url': 'http://twitter.com/search?q=%22%E0%A4%B6%
     E0%A5%8D%E0%A4%B0%E0%A5%80%E0%A4%A8%E0%A4%BF%E0%A4%B5%E0%A4%BE%E0%A4%B8+%E0%A4%B
     0%E0%A4%BE%E0%A4%AE%E0%A4%BE%E0%A4%A8%E0%A5%81%E0%A4%9C%E0%A4%A8%22',
     'promoted_content': None, 'query': '%22%E0%A4%B6%E0%A5%8D%E0%A4%B0%E0%A5%80%E0%A
     4%A8%E0%A4%BF%E0%A4%B5%E0%A4%BE%E0%A4%B8+%E0%A4%B0%E0%A4%BE%E0%A4%AE%E0%A4%BE%E0
     %A4%A8%E0%A5%81%E0%A4%9C%E0%A4%A8%22', 'tweet_volume': None}
     {'name': 'US President', 'url':
     'http://twitter.com/search?q=%22US+President%22', 'promoted_content': None,
     'query': '%22US+President%22', 'tweet_volume': 128227}
[44]: print(type(tweet_data[0]))
```

<class 'dict'>

```
[45]: for key, value in tweet_data[0].items():
          print (key)
     trends
     as_of
     created_at
     locations
[46]: print(tweet_data[0]['locations'])
     [{'name': 'Delhi', 'woeid': 20070458}]
[50]: top_ten_tags=[]
      for i in range (0,10):
        top_ten_tags.append(tweet_data[0]['trends'][i]['name'])
      print(top_ten_tags)
     ['#NationalMathematicsDay', '#PanchayatToParliamentBJP', '#tuesdaymotivations',
     '#SrinivasaRamanujan', '#SaveTodayForFuture', 'Legion of Merit', 'lee sooman',
                          ', 'US President']
[71]: master_hash=top_ten_tags[0][1:]
      print(master_hash)
     NationalMathematicsDay
[73]: trend_headers = {
          'Authorization': 'Bearer {}'.format(access_token)
      '''A UTF-8, URL-encoded search query of 500 characters maximum,
          including operators. Queries may additionally be limited by complexity.'''
      trend params = {
          'q': "%23"+master_hash,
      }
      trend_url = 'https://api.twitter.com/1.1/search/tweets.json'
      trend_resp = requests.get(trend_url, headers=trend_headers, params=trend_params)
[75]: tweets=trend_resp.json()
[76]: #print(tweets)
     {'statuses': [{'created_at': 'Tue Dec 22 05:53:20 +0000 2020', 'id':
     1341260511493517313, 'id_str': '1341260511493517313', 'text': 'RT
     @ieeducation_job: On #NationalMathematicsDay, list of #scholarship for students
     who wish to study math \n\nhttps://t.co/vBDvreKK80', 'truncated': False,
     'entities': {'hashtags': [{'text': 'NationalMathematicsDay', 'indices': [24,
```

```
47]}, {'text': 'scholarship', 'indices': [57, 69]}], 'symbols': [],
'user_mentions': [{'screen_name': 'ieeducation_job', 'name': 'IE Education
Jobs', 'id': 1067361803573841921, 'id str': '1067361803573841921', 'indices':
[3, 19]}], 'urls': [{'url': 'https://t.co/vBDvreKK80', 'expanded_url':
'https://indianexpress.com/article/education/on-national-mathematics-day-list-
of-scholarship-fellowship-programme-available-for-students-7113906/',
'display url': 'indianexpress.com/article/educat...', 'indices': [108, 131]}]},
'metadata': {'iso_language_code': 'en', 'result_type': 'recent'}, 'source': '<a</pre>
href="https://mobile.twitter.com" rel="nofollow">Twitter Web App</a>',
'in_reply_to_status_id': None, 'in_reply_to_status_id_str': None,
'in_reply_to_user_id': None, 'in_reply_to_user_id_str': None,
'in_reply_to_screen_name': None, 'user': {'id': 1313426783757189125, 'id_str':
'1313426783757189125', 'name': 'Iram habib', 'screen_name': 'Iramhabib8',
'location': '', 'description': '', 'url': None, 'entities': {'description':
{'urls': []}}, 'protected': False, 'followers_count': 155, 'friends_count': 308,
'listed_count': 0, 'created_at': 'Tue Oct 06 10:32:24 +0000 2020',
'favourites_count': 289, 'utc_offset': None, 'time_zone': None, 'geo_enabled':
False, 'verified': False, 'statuses_count': 379, 'lang': None,
'contributors_enabled': False, 'is_translator': False, 'is_translation_enabled':
False, 'profile_background_color': 'F5F8FA', 'profile_background_image_url':
None, 'profile_background_image_url_https': None, 'profile_background_tile':
False, 'profile image url':
'http://pbs.twimg.com/profile_images/1313431575913140224/-aCobnbd_normal.jpg',
'profile_image_url_https':
'https://pbs.twimg.com/profile_images/1313431575913140224/-aCobnbd_normal.jpg',
'profile_link_color': '1DA1F2', 'profile_sidebar_border_color': 'CODEED',
'profile_sidebar_fill_color': 'DDEEF6', 'profile_text_color': '333333',
'profile_use_background image': True, 'has extended profile': True,
'default_profile': True, 'default_profile_image': False, 'following': None,
'follow request_sent': None, 'notifications': None, 'translator_type': 'none'},
'geo': None, 'coordinates': None, 'place': None, 'contributors': None,
'retweeted_status': {'created_at': 'Tue Dec 22 05:31:22 +0000 2020', 'id':
1341254986085269505, 'id_str': '1341254986085269505', 'text': 'On
#NationalMathematicsDay, list of #scholarship for students who wish to study
math \n\nhttps://t.co/vBDvreKK80', 'truncated': False, 'entities': {'hashtags':
[{'text': 'NationalMathematicsDay', 'indices': [3, 26]}, {'text': 'scholarship',
'indices': [36, 48]}], 'symbols': [], 'user mentions': [], 'urls': [{'url':
'https://t.co/vBDvreKK80', 'expanded_url':
'https://indianexpress.com/article/education/on-national-mathematics-day-list-
of-scholarship-fellowship-programme-available-for-students-7113906/',
'display_url': 'indianexpress.com/article/educat...', 'indices': [87, 110]}]},
'metadata': {'iso_language_code': 'en', 'result_type': 'recent'}, 'source': '<a</pre>
href="https://about.twitter.com/products/tweetdeck"
rel="nofollow">TweetDeck</a>', 'in_reply_to_status_id': None,
'in_reply_to_status_id_str': None, 'in_reply_to_user_id': None,
'in_reply_to_user_id_str': None, 'in_reply_to_screen_name': None, 'user': {'id':
1067361803573841921, 'id_str': '1067361803573841921', 'name': 'IE Education
Jobs', 'screen_name': 'ieeducation_job', 'location': 'Noida, India',
```

```
'description': '', 'url': 'https://t.co/njoyTJGked', 'entities': {'url':
{'urls': [{'url': 'https://t.co/njoyTJGked', 'expanded_url':
'http://indianexpress.com', 'display_url': 'indianexpress.com', 'indices': [0,
23]}]}, 'description': {'urls': []}}, 'protected': False, 'followers_count':
6843, 'friends count': 2, 'listed count': 25, 'created at': 'Tue Nov 27 10:17:39
+0000 2018', 'favourites_count': 30, 'utc_offset': None, 'time_zone': None,
'geo enabled': False, 'verified': False, 'statuses count': 16358, 'lang': None,
'contributors_enabled': False, 'is_translator': False, 'is_translation_enabled':
False, 'profile_background_color': 'F5F8FA', 'profile_background_image_url':
None, 'profile_background_image_url_https': None, 'profile_background_tile':
False, 'profile_image_url':
'http://pbs.twimg.com/profile_images/1068414753004036096/YkXCtiuU_normal.jpg',
'profile_image_url_https':
'https://pbs.twimg.com/profile_images/1068414753004036096/YkXCtiuU_normal.jpg',
'profile_banner_url':
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'contributors enabled': False, 'is translator': False, 'is translation enabled':
False, 'profile_background_color': 'CODEED', 'profile_background_image_url':
'http://abs.twimg.com/images/themes/theme1/bg.png',
'profile background image url https':
'https://abs.twimg.com/images/themes/theme1/bg.png', 'profile_background_tile':
False, 'profile_image_url':
'http://pbs.twimg.com/profile_images/662735440512860165/3tAKGJVN_normal.jpg',
'profile_image_url_https':
'https://pbs.twimg.com/profile_images/662735440512860165/3tAKGJVN_normal.jpg',
'profile_link_color': '1DA1F2', 'profile_sidebar_border_color': 'CODEED',
'profile_sidebar_fill_color': 'DDEEF6', 'profile_text_color': '333333',
'profile_use_background_image': True, 'has_extended_profile': False,
'default_profile': True, 'default_profile_image': False, 'following': None,
'follow_request_sent': None, 'notifications': None, 'translator_type': 'none'},
'geo': None, 'coordinates': None, 'place': None, 'contributors': None,
'retweeted_status': {'created_at': 'Tue Dec 22 02:45:00 +0000 2020', 'id':
1341213116722536456, 'id str': '1341213116722536456', 'text': 'Mathematics did
not get invented in a classroom. It is in the nature of the Universe.
#SadhguruQuotes... https://t.co/0f6FFguRer', 'truncated': True, 'entities':
{'hashtags': [{'text': 'SadhguruQuotes', 'indices': [86, 101]}], 'symbols': [],
'user_mentions': [], 'urls': [{'url': 'https://t.co/0f6FFguRer', 'expanded_url':
'https://twitter.com/i/web/status/1341213116722536456', 'display_url':
'twitter.com/i/web/status/1...', 'indices': [103, 126]}]}, 'metadata':
{'iso_language_code': 'en', 'result_type': 'recent'}, 'source': '<a
href="https://about.twitter.com/products/tweetdeck"
rel="nofollow">TweetDeck</a>', 'in_reply_to_status_id': None,
'in_reply_to_status_id_str': None, 'in_reply_to_user_id': None,
'in_reply_to_user_id_str': None, 'in_reply_to_screen_name': None, 'user': {'id':
```

```
'location': 'India', 'description': 'A Yogi, Mystic & Visionary. This account is
     managed by volunteers @Ishafoundation. Tweets from Sadhguru himself are signed -
     Sg', 'url': 'http://t.co/S2QHNyuXyg', 'entities': {'url': {'urls': [{'urls':
     'http://t.co/S2QHNyuXyg', 'expanded url': 'http://Isha.Sadhguru.org',
     'display_url': 'Isha.Sadhguru.org', 'indices': [0, 22]}]}, 'description':
     {'urls': []}}, 'protected': False, 'followers count': 3511592, 'friends count':
     2, 'listed_count': 1546, 'created_at': 'Fri Aug 21 13:49:35 +0000 2009',
     'favourites_count': 0, 'utc_offset': None, 'time_zone': None, 'geo_enabled':
     True, 'verified': True, 'statuses_count': 10283, 'lang': None,
     'contributors_enabled': False, 'is_translator': False, 'is_translation_enabled':
     False, 'profile background color': 'B08E76', 'profile background image url':
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     'profile_background_image_url_https':
     'https://abs.twimg.com/images/themes/theme8/bg.gif', 'profile_background_tile':
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     'http://pbs.twimg.com/profile_images/1132191777195085824/KbxIQUxJ_normal.png',
     'profile_image_url_https':
     'https://pbs.twimg.com/profile_images/1132191777195085824/KbxIQUxJ_normal.png',
     'profile_link_color': '04279C', 'profile_sidebar_border_color': '000000',
     'profile sidebar fill color': 'EADEAA', 'profile text color': '333333',
     'profile_use_background_image': True, 'has_extended_profile': False,
     'default_profile': False, 'default_profile_image': False, 'following': None,
     'follow_request_sent': None, 'notifications': None, 'translator_type': 'none'},
     'geo': None, 'coordinates': None, 'place': None, 'contributors': None,
     'is_quote_status': False, 'retweet_count': 2554, 'favorite_count': 5731,
     'favorited': False, 'retweeted': False, 'possibly_sensitive': False, 'lang':
     'en'}, 'is_quote_status': False, 'retweet_count': 2554, 'favorite_count': 0,
     'favorited': False, 'retweeted': False, 'lang': 'en'}], 'search metadata':
     {'completed_in': 0.077, 'max_id': 1341260511493517313, 'max_id_str':
     '1341260511493517313', 'next_results':
     "?max_id=1341260468946690047&q=%2523NationalMathematicsDay&include_entities=1",
     'query': '%2523NationalMathematicsDay', 'refresh_url': '?since_id=13412605114935
     17313&q=%2523NationalMathematicsDay&include_entities=1', 'count': 15,
     'since id': 0, 'since id str': '0'}}
[74]: print(trend_params)
     {'q': '%23NationalMathematicsDay'}
[77]: print(type(tweets))
     <class 'dict'>
[78]: for key, value in tweets.items():
          print (key)
```

67611162, 'id_str': '67611162', 'name': 'Sadhguru', 'screen_name': 'SadhguruJV',

statuses

search_metadata

```
[79]: tweets['search_metadata']
[79]: {'completed_in': 0.077,
       'max_id': 1341260511493517313,
       'max_id_str': '1341260511493517313',
       'next results':
      '?max id=1341260468946690047&q=%2523NationalMathematicsDay&include entities=1',
       'query': '%2523NationalMathematicsDay',
       'refresh_url': '?since_id=1341260511493517313&q=%2523NationalMathematicsDay&inc
      lude_entities=1',
       'count': 15,
       'since_id': 0,
       'since_id_str': '0'}
[81]: type(tweets['statuses'])
[81]: list
     len(tweets['statuses'])
[82]: 15
[83]: tweets['statuses'][0]
[83]: {'created_at': 'Tue Dec 22 05:53:20 +0000 2020',
       'id': 1341260511493517313,
       'id_str': '1341260511493517313',
       'text': 'RT @ieeducation_job: On #NationalMathematicsDay, list of #scholarship
      for students who wish to study math \n\nhttps://t.co/vBDvreKK80',
       'truncated': False,
       'entities': {'hashtags': [{'text': 'NationalMathematicsDay',
          'indices': [24, 47]},
         {'text': 'scholarship', 'indices': [57, 69]}],
        'symbols': [],
        'user mentions': [{'screen name': 'ieeducation job',
          'name': 'IE Education Jobs',
          'id': 1067361803573841921,
          'id_str': '1067361803573841921',
          'indices': [3, 19]}],
        'urls': [{'url': 'https://t.co/vBDvreKK80',
          'expanded_url': 'https://indianexpress.com/article/education/on-national-
      mathematics-day-list-of-scholarship-fellowship-programme-available-for-
      students-7113906/',
          'display_url': 'indianexpress.com/article/educat...',
          'indices': [108, 131]}]},
```

```
'metadata': {'iso_language_code': 'en', 'result_type': 'recent'},
 'source': '<a href="https://mobile.twitter.com" rel="nofollow">Twitter Web
App</a>',
 'in_reply_to_status_id': None,
 'in_reply_to_status_id_str': None,
 'in_reply_to_user_id': None,
 'in_reply_to_user_id_str': None,
 'in_reply_to_screen_name': None,
 'user': {'id': 1313426783757189125,
  'id str': '1313426783757189125',
  'name': 'Iram habib',
  'screen_name': 'Iramhabib8',
  'location': '',
  'description': '',
  'url': None,
  'entities': {'description': {'urls': []}},
  'protected': False,
  'followers_count': 155,
  'friends_count': 308,
  'listed_count': 0,
  'created_at': 'Tue Oct 06 10:32:24 +0000 2020',
  'favourites_count': 289,
  'utc_offset': None,
  'time zone': None,
  'geo_enabled': False,
  'verified': False,
  'statuses_count': 379,
  'lang': None,
  'contributors_enabled': False,
  'is_translator': False,
  'is_translation_enabled': False,
  'profile_background_color': 'F5F8FA',
  'profile_background_image_url': None,
  'profile_background_image_url_https': None,
  'profile_background_tile': False,
  'profile_image_url':
'http://pbs.twimg.com/profile_images/1313431575913140224/-aCobnbd_normal.jpg',
  'profile_image_url_https':
'https://pbs.twimg.com/profile images/1313431575913140224/-aCobnbd normal.jpg',
  'profile link color': '1DA1F2',
  'profile_sidebar_border_color': 'CODEED',
  'profile_sidebar_fill_color': 'DDEEF6',
  'profile_text_color': '333333',
  'profile_use_background_image': True,
  'has_extended_profile': True,
  'default_profile': True,
  'default_profile_image': False,
```

```
'following': None,
  'follow_request_sent': None,
  'notifications': None,
  'translator_type': 'none'},
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 'place': None,
 'contributors': None,
 'retweeted_status': {'created_at': 'Tue Dec 22 05:31:22 +0000 2020',
  'id': 1341254986085269505,
  'id_str': '1341254986085269505',
  'text': 'On #NationalMathematicsDay, list of #scholarship for students who
wish to study math \n\nhttps://t.co/vBDvreKK80',
  'truncated': False,
  'entities': {'hashtags': [{'text': 'NationalMathematicsDay',
     'indices': [3, 26]},
    {'text': 'scholarship', 'indices': [36, 48]}],
   'symbols': [],
   'user_mentions': [],
   'urls': [{'url': 'https://t.co/vBDvreKK80',
     'expanded_url': 'https://indianexpress.com/article/education/on-national-
mathematics-day-list-of-scholarship-fellowship-programme-available-for-
students-7113906/',
     'display url': 'indianexpress.com/article/educat...',
     'indices': [87, 110]}]},
  'metadata': {'iso language code': 'en', 'result type': 'recent'},
  'source': '<a href="https://about.twitter.com/products/tweetdeck"
rel="nofollow">TweetDeck</a>',
  'in_reply_to_status_id': None,
  'in_reply_to_status_id_str': None,
  'in_reply_to_user_id': None,
  'in_reply_to_user_id_str': None,
  'in_reply_to_screen_name': None,
  'user': {'id': 1067361803573841921,
   'id_str': '1067361803573841921',
   'name': 'IE Education Jobs',
   'screen_name': 'ieeducation_job',
   'location': 'Noida, India',
   'description': '',
   'url': 'https://t.co/njoyTJGked',
   'entities': {'url': {'urls': [{'url': 'https://t.co/njoyTJGked',
       'expanded_url': 'http://indianexpress.com',
       'display_url': 'indianexpress.com',
       'indices': [0, 23]}]},
    'description': {'urls': []}},
   'protected': False,
   'followers_count': 6843,
```

```
'friends_count': 2,
   'listed_count': 25,
   'created_at': 'Tue Nov 27 10:17:39 +0000 2018',
   'favourites_count': 30,
   'utc_offset': None,
   'time_zone': None,
   'geo enabled': False,
   'verified': False,
   'statuses_count': 16358,
   'lang': None,
   'contributors enabled': False,
   'is_translator': False,
   'is_translation_enabled': False,
   'profile_background_color': 'F5F8FA',
   'profile_background_image_url': None,
   'profile_background_image_url_https': None,
   'profile_background_tile': False,
   'profile_image_url':
'http://pbs.twimg.com/profile_images/1068414753004036096/YkXCtiuU_normal.jpg',
   'profile_image_url_https':
'https://pbs.twimg.com/profile_images/1068414753004036096/YkXCtiuU_normal.jpg',
   'profile banner url':
'https://pbs.twimg.com/profile_banners/1067361803573841921/1593237469',
   'profile link color': '1DA1F2',
   'profile_sidebar_border_color': 'CODEED',
   'profile_sidebar_fill_color': 'DDEEF6',
   'profile_text_color': '333333',
   'profile_use_background_image': True,
   'has_extended_profile': False,
   'default_profile': True,
   'default_profile_image': False,
   'following': None,
   'follow_request_sent': None,
   'notifications': None,
   'translator_type': 'none'},
  'geo': None,
  'coordinates': None,
  'place': None,
  'contributors': None,
  'is_quote_status': False,
  'retweet count': 6,
  'favorite_count': 29,
  'favorited': False,
  'retweeted': False,
  'possibly_sensitive': False,
  'lang': 'en'},
 'is_quote_status': False,
```

```
'retweet_count': 6,
'favorite_count': 0,
'favorited': False,
'retweeted': False,
'possibly_sensitive': False,
'lang': 'en'}
```

CHecking the keys present in dict of a single tweet

0.1 Converting list of dicts to a dataframe

https://stackoverflow.com/q/20638006/6427607

```
[88]: df = pd.DataFrame(tweets['statuses'])
[90]: pd.set_option('display.max_columns', None)
      df
[90]:
                              created_at
                                                            id
                                                                              id_str \
      0
          Tue Dec 22 05:53:20 +0000 2020
                                           1341260511493517313
                                                                1341260511493517313
          Tue Dec 22 05:53:17 +0000 2020
      1
                                           1341260502991695874
                                                                1341260502991695874
      2
          Tue Dec 22 05:53:14 +0000 2020
                                           1341260489930715136
                                                                1341260489930715136
          Tue Dec 22 05:53:14 +0000 2020
      3
                                           1341260488697470977
                                                                1341260488697470977
          Tue Dec 22 05:53:13 +0000 2020
                                           1341260483366539266
                                                                1341260483366539266
      5
          Tue Dec 22 05:53:11 +0000 2020
                                           1341260477821669378 1341260477821669378
      6
          Tue Dec 22 05:53:11 +0000 2020
                                           1341260476622065664 1341260476622065664
      7
          Tue Dec 22 05:53:11 +0000 2020
                                           1341260475514818560 1341260475514818560
          Tue Dec 22 05:53:11 +0000 2020
                                           1341260474566918149 1341260474566918149
          Tue Dec 22 05:53:11 +0000 2020
                                           1341260473740664833 1341260473740664833
      10
         Tue Dec 22 05:53:10 +0000 2020
                                           1341260472742518789 1341260472742518789
          Tue Dec 22 05:53:10 +0000 2020
                                           1341260471676981253
                                                                1341260471676981253
      12
          Tue Dec 22 05:53:10 +0000 2020
                                           1341260471442178048 1341260471442178048
          Tue Dec 22 05:53:10 +0000 2020
      13
                                           1341260471110750208
                                                                1341260471110750208
          Tue Dec 22 05:53:09 +0000 2020
                                           1341260468946690048 1341260468946690048
                                                        text truncated \
      0
          RT @ieeducation_job: On #NationalMathematicsDa...
                                                                False
      1
          RT @AmitAgarwal: It's #NationalMathematicsDay,...
                                                                False
      2
          RT @SadhguruJV: Mathematics did not get invent...
                                                                False
      3
          RT @dineshjoshilax:
                                      #SrinivasaRam...
                                                          False
      4
          RT @indutiwarijbp:
                                                 False
      5
          RT @punia_tanuj:
                                                False
          RT @dinesh_ve: An equation means nothing to me...
      6
                                                                False
      7
          RT @NTPatel1999: Born on this day in the year ...
                                                                False
      8
          RT @DainikBhaskar:
                                                     False
      9
          RT @PANKAJ_RJ46: Shrinivasa Ramanujan made inc...
                                                                False
         RT @SadhguruJV: Mathematics did not get invent...
                                                                False
```

```
11
                                 True
12
                                        True
13
    RT @PranavKVFC: Nee epo en life kulla vandhiyo...
                                                             False
14
    RT @SadhguruJV: Mathematics did not get invent...
                                                             False
                                                entities \
0
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    {'hashtags': [{'text': 'NationalMathematicsDay...
    {'hashtags': [{'text': 'SadhguruQuotes', 'indi...
2
3
    {'hashtags': [{'text': 'SrinivasaRamanujan', '...
    {'hashtags': [], 'symbols': [], 'user_mentions...
4
5
    {'hashtags': [], 'symbols': [], 'user_mentions...
6
    {'hashtags': [], 'symbols': [], 'user_mentions...
7
    {'hashtags': [], 'symbols': [], 'user_mentions...
    {'hashtags': [], 'symbols': [], 'user_mentions...
8
    {'hashtags': [], 'symbols': [], 'user_mentions...
9
    {'hashtags': [{'text': 'SadhguruQuotes', 'indi...
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11
12
    {'hashtags': [], 'symbols': [], 'user_mentions...
13
    {'hashtags': [], 'symbols': [], 'user_mentions...
    {'hashtags': [{'text': 'SadhguruQuotes', 'indi...
                                                metadata \
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    {'iso_language_code': 'en', 'result_type': 're...
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    {'iso_language_code': 'en', 'result_type': 're...
    {'iso_language_code': 'hi', 'result_type': 're...
3
    {'iso_language_code': 'hi', 'result_type': 're...
4
5
    {'iso_language_code': 'hi', 'result_type': 're...
    {'iso_language_code': 'en', 'result_type': 're...
6
7
    {'iso_language_code': 'en', 'result_type': 're...
    {'iso_language_code': 'hi', 'result_type': 're...
8
    {'iso_language_code': 'en', 'result_type': 're...
9
    {'iso_language_code': 'en', 'result_type': 're...
    {'iso_language_code': 'te', 'result_type': 're...
11
12
    {'iso_language_code': 'hi', 'result_type': 're...
    {'iso_language_code': 'et', 'result_type': 're...
13
    {'iso_language_code': 'en', 'result_type': 're...
                                                  source in_reply_to_status_id \
0
    <a href="https://mobile.twitter.com" rel="nofo...</pre>
                                                                          None
1
    <a href="http://twitter.com/download/iphone" r...</pre>
                                                                          None
2
    <a href="https://mobile.twitter.com" rel="nofo...</pre>
                                                                          None
3
    <a href="http://twitter.com/download/android" ...
                                                                          None
4
    <a href="http://twitter.com/download/android" ...</pre>
                                                                          None
5
    <a href="https://mobile.twitter.com" rel="nofo...</pre>
                                                                          None
    <a href="http://twitter.com/download/android" ...</pre>
                                                                          None
```

```
7
    <a href="http://twitter.com/download/android" ...
                                                                           None
    <a href="http://twitter.com/download/android" ...</pre>
8
                                                                           None
9
    <a href="http://twitter.com/download/android" ...
                                                                           None
    <a href="http://twitter.com/download/android" ...</pre>
10
                                                                           None
    <a href="http://twitter.com/download/android" ...
                                                                           None
12
    <a href="https://mobile.twitter.com" rel="nofo...</pre>
                                                                           None
    <a href="http://twitter.com/download/android" ...</pre>
                                                                           None
13
    <a href="http://twitter.com/download/android" ...
                                                                           None
   in_reply_to_status_id_str in_reply_to_user_id in_reply_to_user_id_str
0
                          None
                                               None
                                                                          None
1
                          None
                                               None
                                                                          None
2
                          None
                                               None
                                                                          None
3
                          None
                                               None
                                                                          None
4
                          None
                                               None
                                                                          None
5
                          None
                                               None
                                                                          None
6
                                                                          None
                          None
                                               None
7
                          None
                                               None
                                                                          None
8
                          None
                                               None
                                                                          None
9
                          None
                                               None
                                                                          None
10
                          None
                                               None
                                                                          None
11
                                                                          None
                          None
                                               None
12
                          None
                                               None
                                                                          None
13
                                                                          None
                          None
                                               None
14
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                                               None
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   in_reply_to_screen_name
                                                                               user
0
                              {'id': 1313426783757189125, 'id_str': '1313426...
                        None
1
                       None
                              {'id': 3276476922, 'id_str': '3276476922', 'na...
2
                              {'id': 1163437429543411713, 'id_str': '1163437...
                       None
3
                              {'id': 844852568580796419, 'id_str': '84485256...
                       None
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4
                       None
5
                       None
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                       None
7
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8
                       None
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9
                             {'id': 1193451099023233025, 'id str': '1193451...
                       None
10
                       None
                              {'id': 856114818, 'id_str': '856114818', 'name...
11
                       None
                              {'id': 1153918154755588096, 'id_str': '1153918...
12
                              {'id': 2506662439, 'id_str': '2506662439', 'na...
                       None
13
                              {'id': 1337284744090828800, 'id_str': '1337284...
                       None
14
                             {'id': 4149915859, 'id_str': '4149915859', 'na...
     geo coordinates place contributors
0
    None
                 None
                       None
                                      None
1
    None
                 None
                       None
                                      None
2
    None
                 None
                       None
                                      None
```

```
3
    None
                 None
                       None
                                     None
4
    None
                 None
                       None
                                     None
5
    None
                 None
                       None
                                     None
6
    None
                 None
                       None
                                     None
7
    None
                 None
                      None
                                     None
8
    None
                 None
                       None
                                     None
9
    None
                 None None
                                     None
10
   None
                 None None
                                     None
11
   None
                 None None
                                     None
12
   None
                 None None
                                     None
13
    None
                 None
                       None
                                     None
14
   None
                 None
                       None
                                     None
                                        retweeted_status
                                                           is_quote_status \
0
    {'created_at': 'Tue Dec 22 05:31:22 +0000 2020...
                                                                    False
1
    {'created_at': 'Tue Dec 22 05:48:20 +0000 2020...
                                                                    False
2
    {'created_at': 'Tue Dec 22 02:45:00 +0000 2020...
                                                                    False
3
    {'created_at': 'Tue Dec 22 03:34:52 +0000 2020...
                                                                    False
4
    {'created_at': 'Tue Dec 22 05:31:22 +0000 2020...
                                                                    False
5
    {'created_at': 'Tue Dec 22 02:35:23 +0000 2020...
                                                                    False
    {'created_at': 'Tue Dec 22 05:07:18 +0000 2020...
6
                                                                    False
7
    {'created at': 'Mon Dec 21 18:33:59 +0000 2020...
                                                                    False
    {'created_at': 'Tue Dec 22 03:45:00 +0000 2020...
8
                                                                    False
9
    {'created at': 'Tue Dec 22 05:53:02 +0000 2020...
                                                                    False
    {'created_at': 'Tue Dec 22 02:45:00 +0000 2020...
                                                                    False
11
                                                      NaN
                                                                      False
12
                                                                      False
                                                      NaN
13
    {'created_at': 'Tue Dec 22 03:54:44 +0000 2020...
                                                                    False
    {'created_at': 'Tue Dec 22 02:45:00 +0000 2020...
                                                                    False
    retweet_count
                    favorite_count
                                     favorited retweeted possibly_sensitive \
0
                 6
                                  0
                                                      False
                                                                          False
                                          False
                 2
1
                                  0
                                          False
                                                      False
                                                                            NaN
                                  0
2
              2554
                                          False
                                                      False
                                                                            NaN
3
                                  0
                                          False
                                                      False
                                                                            NaN
                 1
4
                 3
                                  0
                                          False
                                                      False
                                                                            NaN
5
                 9
                                  0
                                          False
                                                      False
                                                                            NaN
6
                 4
                                  0
                                          False
                                                      False
                                                                            NaN
7
                 5
                                  0
                                          False
                                                      False
                                                                            NaN
8
                23
                                  0
                                          False
                                                      False
                                                                            NaN
9
                                  0
                 1
                                          False
                                                      False
                                                                            NaN
10
              2554
                                  0
                                          False
                                                      False
                                                                            NaN
                                  0
                                          False
                                                      False
                                                                          False
11
                 0
12
                 1
                                  2
                                          False
                                                      False
                                                                          False
                                  0
13
                                          False
                                                      False
                                                                            NaN
                11
14
                                  0
              2554
                                          False
                                                      False
                                                                            NaN
```

```
lang
0
     en
1
     en
2
     en
3
     hi
4
     hi
5
     hi
6
     en
7
     en
8
     hi
9
     en
10
     en
11
     te
12
     hi
13
     et
14
     en
```

1 Extracting tweets

```
[137]: def get_tweets_since(url_given):
           trend_headers = {
               'Authorization': 'Bearer {}'.format(access_token)
           '''A UTF-8, URL-encoded search query of 500 characters maximum,
               including operators. Queries may additionally be limited by complexity.
        \hookrightarrow III
           trend_params = {
               'q': "%23"+master_hash,
               'count': 100,
               'min_id':0
           }
           if url_given==-1:
               trend_url = 'https://api.twitter.com/1.1/search/tweets.json'
               trend_resp = requests.get(trend_url, headers=trend_headers,__
        →params=trend_params)
           else:
               trend_url='https://api.twitter.com/1.1/search/tweets.json'+url_given
               trend_resp = requests.get(trend_url, headers=trend_headers,__
        →params=trend_params)
           tweets=trend_resp.json()
           #return tweets['statuses'], tweets['search_metadata']["max_id"]
           return tweets
```

```
[138]: | tweets_list=[]
      give_url=-1
      for i in range (0,105):
          tweets_obj=get_tweets_since(give_url)
          #print(type(tweets_obj))
          #print(tweets_obj)
          tmp_list=tweets_obj['statuses']
          #print(now_min_id)
          #now min id=tweets obj['search metadata']["max id"]+1
          print('Netx res',tweets_obj['search_metadata']["next_results"])
          give url=tweets obj['search metadata']["next results"]
          tweets_list.extend(tmp_list)
          print("len of master list now is",len(tweets list))
          print(tweets_obj['search_metadata']["max_id"])
          print('len of tmp_list is ',len(tmp_list))
          print("id of first tweet in current stint is ",tmp_list[0]['id'])
          #for j in tmp_list:
              #print(j['id'])
       Netx res ?max_id=1341289202781020162&q=%2523NationalMathematicsDay&count=100&inc
      lude entities=1
      len of master list now is 100
      1341289965087379457
      len of tmp_list is 100
      id of first tweet in current stint is 1341289965087379457
      Netx res ?max_id=1341288596234358784&q=%2523NationalMathematicsDay&count=100&inc
      lude entities=1
      len of master list now is 200
      1341289202781020162
      len of tmp_list is 100
      id of first tweet in current stint is 1341289195898167296
      Netx res ?max id=1341287878740029439&q=%2523NationalMathematicsDay&count=100&inc
      lude_entities=1
      len of master list now is 300
      1341288596234358784
      len of tmp_list is 100
      id of first tweet in current stint is 1341288593168486401
```

Netx res ?max_id=1341287180103077889&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 400
1341287878740029439
len of tmp_list is 100
id of first tweet in current stint is 1341287877100019717
Netx res ?max_id=1341286541927170048&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 500
1341287180103077889
len of tmp_list is 100
id of first tweet in current stint is 1341287176697380865
Netx res ?max_id=1341285929454071808&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 600
1341286541927170048
len of tmp_list is 100
id of first tweet in current stint is 1341286538420752384
Netx res ?max_id=1341285318238949375&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 700
1341285929454071808
len of tmp_list is 100
id of first tweet in current stint is 1341285929386790912
Netx res ?max_id=1341284711155556351&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 800
1341285318238949375
len of tmp_list is 100
id of first tweet in current stint is 1341285316527677443
Netx res ?max_id=1341284079677784063&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 900
1341284711155556351
len of tmp_list is 100
id of first tweet in current stint is 1341284705145139202
```

Netx res ?max_id=1341283440965009419&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 1000
1341284079677784063
len of tmp_list is 100
id of first tweet in current stint is 1341284073918976001
Netx res ?max_id=1341282892224323584&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 1100
1341283440965009419
len of tmp_list is 100
id of first tweet in current stint is 1341283435130671106
Netx res ?max_id=1341282360843620351&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 1200
1341282892224323584
len of tmp_list is 100
id of first tweet in current stint is 1341282880962449408
Netx res ?max_id=1341281850019332095&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 1300
1341282360843620351
len of tmp_list is 100
id of first tweet in current stint is 1341282360717836289
Netx res ?max_id=1341281296601894913&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 1400
1341281850019332095
len of tmp_list is 100
id of first tweet in current stint is 1341281839982342145
Netx res ?max_id=1341280715426557952&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 1500
1341281296601894913
len of tmp_list is 100
id of first tweet in current stint is 1341281294475436039
```

Netx res ?max_id=1341280179071508482&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 1600
1341280715426557952
len of tmp_list is 100
id of first tweet in current stint is 1341280707629383682
Netx res ?max_id=1341279663570739201&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 1700
1341280179071508482
len of tmp_list is 100
id of first tweet in current stint is 1341280177905573889
Netx res ?max_id=1341279148623364095&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 1800
1341279663570739201
len of tmp_list is 100
id of first tweet in current stint is 1341279659242135553
Netx res ?max_id=1341278632644206594&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 1900
1341279148623364095
len of tmp_list is 100
id of first tweet in current stint is 1341279144496119809
Netx res ?max_id=1341278000780701696&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 2000
1341278632644206594
len of tmp_list is 100
id of first tweet in current stint is 1341278620187119617
Netx res ?max_id=1341277534265114623&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 2100
1341278000780701696
len of tmp_list is 100
id of first tweet in current stint is 1341277990827794433
```

Netx res ?max_id=1341276900031832063&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 2200
1341277534265114623
len of tmp_list is 100
id of first tweet in current stint is 1341277533136855040
Netx res ?max_id=1341276365769752576&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 2300
1341276900031832063
len of tmp_list is 100
id of first tweet in current stint is 1341276899079639040
Netx res ?max_id=1341275827271475201&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 2400
1341276365769752576
len of tmp_list is 100
id of first tweet in current stint is 1341276358614368257
Netx res ?max_id=1341275257416470531&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 2500
1341275827271475201
len of tmp_list is 100
id of first tweet in current stint is 1341275826625507328
Netx res ?max_id=1341274679823060992&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 2600
1341275257416470531
len of tmp_list is 100
id of first tweet in current stint is 1341275257001414656
Netx res ?max_id=1341274137809973247&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 2700
1341274679823060992
len of tmp_list is 100
id of first tweet in current stint is 1341274676547313664
```

Netx res ?max_id=1341273628474658818&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 2800
1341274137809973247
len of tmp_list is 100
id of first tweet in current stint is 1341274132571275264
Netx res ?max_id=1341273094590091263&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 2900
1341273628474658818
len of tmp_list is 100
id of first tweet in current stint is 1341273601308168195
Netx res ?max_id=1341272591885996031&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3000
1341273094590091263
len of tmp_list is 100
id of first tweet in current stint is 1341273082288164864
Netx res ?max_id=1341272142336278532&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3100
1341272591885996031
len of tmp_list is 100
id of first tweet in current stint is 1341272586089426945
Netx res ?max_id=1341271680329547778&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3200
1341272142336278532
len of tmp_list is 100
id of first tweet in current stint is 1341272138691440640
Netx res ?max_id=1341271176400621567&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3300
1341271680329547778
len of tmp_list is 100
id of first tweet in current stint is 1341271679733911552
```

Netx res ?max_id=1341270717988392964&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 3400
1341271176400621567
len of tmp_list is 100
id of first tweet in current stint is 1341271166103605255
Netx res ?max_id=1341270376182030337&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 3500
1341270717988392964
len of tmp_list is 100
id of first tweet in current stint is 1341270717833175041
Netx res ?max_id=1341269838115684355&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3600
1341270376182030337
len of tmp_list is 100
id of first tweet in current stint is 1341270368930070536
Netx res ?max_id=1341269339584999428&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3700
1341269838115684355
len of tmp_list is 100
id of first tweet in current stint is 1341269838103080960
Netx res ?max_id=1341268725106790399&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3800
1341269339584999428
len of tmp_list is 100
id of first tweet in current stint is 1341269337705914368
Netx res ?max_id=1341268299472990209&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 3900
1341268725106790399
len of tmp_list is 100
id of first tweet in current stint is 1341268721017511936
```

Netx res ?max_id=1341267755450814463&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 4000
1341268299472990209
len of tmp_list is 100
id of first tweet in current stint is 1341268295475838978
Netx res ?max_id=1341267224707751936&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4100
1341267755450814463
len of tmp_list is 100
id of first tweet in current stint is 1341267755316596736
Netx res ?max_id=1341266806044946431&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4200
1341267224707751936
len of tmp_list is 100
id of first tweet in current stint is 1341267224649150472
Netx res ?max_id=1341266408794017796&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4300
1341266806044946431
len of tmp_list is 100
id of first tweet in current stint is 1341266802089738242
Netx res ?max_id=1341265891606941698&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4400
1341266408794017796
len of tmp_list is 100
id of first tweet in current stint is 1341266400598355968
Netx res ?max_id=1341265397127921666&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4500
1341265891606941698
len of tmp_list is 100
id of first tweet in current stint is 1341265888746504192
```

Netx res ?max_id=1341264890862788609&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 4600
1341265397127921666
len of tmp_list is 100
id of first tweet in current stint is 1341265396402278402
Netx res ?max_id=1341264432165371904&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4700
1341264890862788609
len of tmp_list is 100
id of first tweet in current stint is 1341264883728334850
Netx res ?max_id=1341263931759718406&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4800
1341264432165371904
len of tmp_list is 100
id of first tweet in current stint is 1341264425580294144
Netx res ?max_id=1341263482604331008&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 4900
1341263931759718406
len of tmp_list is 100
id of first tweet in current stint is 1341263929415090177
Netx res ?max_id=1341262989165391872&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 5000
1341263482604331008
len of tmp_list is 100
id of first tweet in current stint is 1341263467794186241
Netx res ?max_id=1341262464168591360&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 5100
1341262989165391872
len of tmp_list is 100
id of first tweet in current stint is 1341262980663558145
```

Netx res ?max_id=1341261965692461056&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 5200
1341262464168591360
len of tmp_list is 100
id of first tweet in current stint is 1341262449731751936
Netx res ?max_id=1341261496366469120&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 5300
1341261965692461056
len of tmp_list is 100
id of first tweet in current stint is 1341261960722059266
Netx res ?max_id=1341261042324656127&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 5400
1341261496366469120
len of tmp_list is 100
id of first tweet in current stint is 1341261488929968128
Netx res ?max_id=1341260548365676545&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 5500
1341261042324656127
len of tmp_list is 100
id of first tweet in current stint is 1341261039883542529
Netx res ?max_id=1341260135679737856&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 5600
1341260548365676545
len of tmp_list is 100
id of first tweet in current stint is 1341260544162951170
Netx res ?max_id=1341259698868129791&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 5700
1341260135679737856
len of tmp_list is 100
id of first tweet in current stint is 1341260131636428800
```

Netx res ?max_id=1341259224693665795&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 5800
1341259698868129791
len of tmp_list is 100
id of first tweet in current stint is 1341259695743373313
Netx res ?max_id=1341258792525123584&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 5900
1341259224693665795
len of tmp_list is 100
id of first tweet in current stint is 1341259217391427585
Netx res ?max_id=1341258334775570432&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6000
1341258792525123584
len of tmp_list is 100
id of first tweet in current stint is 1341258779325734914
Netx res ?max_id=1341257805236322303&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6100
1341258334775570432
len of tmp_list is 100
id of first tweet in current stint is 1341258333399879680
Netx res ?max_id=1341257267312779264&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6200
1341257805236322303
len of tmp_list is 100
id of first tweet in current stint is 1341257798248587265
Netx res ?max_id=1341256841737584644&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6300
1341257267312779264
len of tmp_list is 100
id of first tweet in current stint is 1341257266918346752
```

Netx res ?max_id=1341256412450619391&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 6400
1341256841737584644
len of tmp_list is 100
id of first tweet in current stint is 1341256841238462464
Netx res ?max_id=1341255887336271871&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6500
1341256412450619391
len of tmp_list is 100
id of first tweet in current stint is 1341256409468440576
Netx res ?max_id=1341255357306261505&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6600
1341255887336271871
len of tmp_list is 100
id of first tweet in current stint is 1341255856952774656
Netx res ?max_id=1341254969962319871&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6700
1341255357306261505
len of tmp_list is 100
id of first tweet in current stint is 1341255349400084481
Netx res ?max_id=1341254640193720320&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6800
1341254969962319871
len of tmp_list is 100
id of first tweet in current stint is 1341254966632058883
Netx res ?max_id=1341254250228113407&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 6900
1341254640193720320
len of tmp_list is 100
id of first tweet in current stint is 1341254640109715458
```

Netx res ?max_id=1341253933222662144&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 7000
1341254250228113407
len of tmp_list is 100
id of first tweet in current stint is 1341254249041129474
Netx res ?max_id=1341253517084745727&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 7100
1341253933222662144
len of tmp_list is 100
id of first tweet in current stint is 1341253930873810948
Netx res ?max_id=1341253222569164803&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 7200
1341253517084745727
len of tmp_list is 100
id of first tweet in current stint is 1341253515847430144
Netx res ?max_id=1341252881161154561&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 7300
1341253222569164803
len of tmp_list is 100
id of first tweet in current stint is 1341253219813474304
Netx res ?max_id=1341252527786926080&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 7400
1341252881161154561
len of tmp_list is 100
id of first tweet in current stint is 1341252879760257024
Netx res ?max_id=1341252230456856575&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 7500
1341252527786926080
len of tmp_list is 100
id of first tweet in current stint is 1341252519519895553
```

Netx res ?max_id=1341251809629798399&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 7600
1341252230456856575
len of tmp_list is 100
id of first tweet in current stint is 1341252229383122945
Netx res ?max_id=1341251424697511936&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 7700
1341251809629798399
len of tmp_list is 100
id of first tweet in current stint is 1341251803099357190
Netx res ?max_id=1341251096451239937&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 7800
1341251424697511936
len of tmp_list is 100
id of first tweet in current stint is 1341251423137193984
Netx res ?max_id=1341250732457017344&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 7900
1341251096451239937
len of tmp_list is 100
id of first tweet in current stint is 1341251096262496256
Netx res ?max_id=1341250396870696962&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8000
1341250732457017344
len of tmp_list is 100
id of first tweet in current stint is 1341250727943933953
Netx res ?max_id=1341250010533351424&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8100
1341250396870696962
len of tmp_list is 100
id of first tweet in current stint is 1341250396455485440
```

Netx res ?max_id=1341249635256422400&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 8200
1341250010533351424
len of tmp_list is 100
id of first tweet in current stint is 1341250004367753218
Netx res ?max_id=1341249227972743169&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8300
1341249635256422400
len of tmp_list is 100
id of first tweet in current stint is 1341249629757685760
Netx res ?max_id=1341248814833778687&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8400
1341249227972743169
len of tmp_list is 100
id of first tweet in current stint is 1341249226911535104
Netx res ?max_id=1341248460050186240&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8500
1341248814833778687
len of tmp_list is 100
id of first tweet in current stint is 1341248813839761409
Netx res ?max_id=1341248085423345663&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8600
1341248460050186240
len of tmp_list is 100
id of first tweet in current stint is 1341248460046086144
Netx res ?max_id=1341247783496536068&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8700
1341248085423345663
len of tmp_list is 100
id of first tweet in current stint is 1341248081044463617
```

Netx res ?max_id=1341247463039016959&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 8800
1341247783496536068
len of tmp_list is 100
id of first tweet in current stint is 1341247781344747520
Netx res ?max_id=1341247029054373889&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 8900
1341247463039016959
len of tmp_list is 100
id of first tweet in current stint is 1341247461109628928
Netx res ?max_id=1341246622995345407&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9000
1341247029054373889
len of tmp_list is 100
id of first tweet in current stint is 1341247027313709056
Netx res ?max_id=1341246274125762559&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9100
1341246622995345407
len of tmp_list is 100
id of first tweet in current stint is 1341246620013236224
Netx res ?max_id=1341245948802912255&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9200
1341246274125762559
len of tmp_list is 100
id of first tweet in current stint is 1341246273769238529
Netx res ?max_id=1341245565904900096&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9300
1341245948802912255
len of tmp_list is 100
id of first tweet in current stint is 1341245936241012737
```

Netx res ?max_id=1341245136580198400&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 9400
1341245565904900096
len of tmp_list is 100
id of first tweet in current stint is 1341245547034730502
Netx res ?max_id=1341244771923156993&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 9500
1341245136580198400
len of tmp_list is 100
id of first tweet in current stint is 1341245128074137600
Netx res ?max_id=1341244330774687749&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9600
1341244771923156993
len of tmp_list is 100
id of first tweet in current stint is 1341244757897404421
Netx res ?max_id=1341243917602189311&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9700
1341244330774687749
len of tmp_list is 100
id of first tweet in current stint is 1341244329608691717
Netx res ?max_id=1341243547320610815&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9800
1341243917602189311
len of tmp_list is 100
id of first tweet in current stint is 1341243914041192448
Netx res ?max_id=1341243141240672255&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 9900
1341243547320610815
len of tmp_list is 100
id of first tweet in current stint is 1341243545621950464
```

Netx res ?max_id=1341242766978809855&q=%2523NationalMathematicsDay&count=100&inc

```
lude_entities=1
len of master list now is 10000
1341243141240672255
len of tmp_list is 100
id of first tweet in current stint is 1341243137444904960
Netx res ?max_id=1341242394885246975&q=%2523NationalMathematicsDay&count=100&inc
lude entities=1
len of master list now is 10100
1341242766978809855
len of tmp_list is 100
id of first tweet in current stint is 1341242763568791552
Netx res ?max_id=1341242048213442559&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 10200
1341242394885246975
len of tmp_list is 100
id of first tweet in current stint is 1341242391966011392
Netx res ?max_id=1341241711616434175&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 10300
1341242048213442559
len of tmp_list is 100
id of first tweet in current stint is 1341242047676600321
Netx res ?max_id=1341241366328844287&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 10400
1341241711616434175
len of tmp_list is 100
id of first tweet in current stint is 1341241709330513920
Netx res ?max_id=1341241078561685503&q=%2523NationalMathematicsDay&count=100&inc
lude_entities=1
len of master list now is 10500
1341241366328844287
len of tmp_list is 100
id of first tweet in current stint is 1341241355100557313
```

```
[]:
[117]: len(tweets_list)
[117]: 100
```

1.1 Storing the 105k tweets as JSON

1.2 Involving useful columns in a dataframe

Link describing the field meanings: https://developer.twitter.com/en/docs/twitter-api/v1/data-dictionary/object-model/tweet

```
[64]: i=0
print(tweets_list[i]["id"])

# The actual UTF-8 text of the status update.
print(tweets_list[i]["text"])

# Name of the user
print(tweets_list[i]["user"]["name"])
print(tweets_list[i]["user"]["followers_count"])
print(tweets_list[i]["user"]["friends_count"])
print(tweets_list[i]["user"]["verified"])

#Number of times this Tweet has been retweeted.
print(tweets_list[i]["retweet_count"])
print(tweets_list[i]["favorite_count"])
print(tweets_list[i]["lang"])

# Entities
```

```
print(tweets_list[i]["entities"])
print(tweets_list[i]["entities"]["hashtags"])
print(tweets_list[i]["entities"]["urls"])
#print(tweets_list[i]["entities"]["media"])
1341289965087379457
Remembering the Legendary Mathematician, #SrinivasaRamanujan on his birth
anniversary, which is also celebrated as... https://t.co/yBFxhF8Iio
Sujeet Kumar
3670
340
True
0
0
{'hashtags': [{'text': 'SrinivasaRamanujan', 'indices': [41, 60]}], 'symbols':
[], 'user_mentions': [], 'urls': [{'url': 'https://t.co/yBFxhF8Iio',
'expanded_url': 'https://twitter.com/i/web/status/1341289965087379457',
```

'display_url': 'twitter.com/i/web/status/1...', 'indices': [116, 139]}]}

'https://twitter.com/i/web/status/1341289965087379457', 'display_url':

1.3 Selecting useful fields and other processing

[{'text': 'SrinivasaRamanujan', 'indices': [41, 60]}] [{'url': 'https://t.co/yBFxhF8Iio', 'expanded url':

'twitter.com/i/web/status/1...', 'indices': [116, 139]}]

```
[65]: mod_list=[]
      cnt=0
      user_id_list=[]
      extra hashtags list=[]
      text str=""
      user_map={}
      for a_tweet in tweets_list:
          tmp_d={}
          #tmp_d["id"]=a_tweet["id"]
          tmp_d["user_name"]=a_tweet["user"]["name"]
          tmp_d["num_retweets"] = a_tweet["retweet_count"]
          tmp_d["num_likes"] = a_tweet["favorite_count"]
          tmp_d["lang"] = a_tweet["lang"]
          tmp_d["num_user_followers"] = a_tweet["user"]["followers_count"]
          tmp d["num user friends"] = a tweet["user"]["friends count"]
          tmp_d["num_ext_hashtags"]=0
          tmp d["num ext urls"]=0
          tmp d["num ext media"]=0
          tmp d['text'] = a tweet['text']
          text_str=text_str+"\n\n"+tmp_d['text']
```

```
if a_tweet["user"]["verified"]==True:
              tmp_d["is_verified"]="verified"
          else:
              tmp_d["is_verified"]="not_verified"
          if "hashtags" in a_tweet["entities"].keys():
              tmp_d["num_ext_hashtags"]=len(a_tweet["entities"]["hashtags"])
              for x in a_tweet["entities"]["hashtags"]:
                  extra hashtags list.append(x['text'])
          if "urls" in a tweet["entities"].keys():
              tmp d["num ext urls"]=len(a tweet["entities"]["urls"])
          if "media" in a_tweet["entities"].keys():
              tmp_d["num_ext_media"]=len(a_tweet["entities"]["media"])
          if "coordinates" in a_tweet.keys() and a_tweet["coordinates"]!=None:
              #print(a_tweet.keys())
              #print(a_tweet["coordinates"]["coordinates"])
              tmp_d["longitude"] = a_tweet["coordinates"]["coordinates"][0]
              tmp_d["latitude"] = a_tweet["coordinates"]["coordinates"][1]
              cnt+=1
          elif a_tweet["place"]!=None:
              #print(a_tweet["place"]["bounding_box"]["coordinates"][0][0])
       →tmp_d["longitude"]=a_tweet["place"]["bounding_box"]["coordinates"][0][0][0]
       →tmp_d["latitude"]=a_tweet["place"]["bounding_box"]["coordinates"][0][0][1]
              cnt+=1
          mod list.append(tmp d)
          user_id_list.append(a_tweet["user"]["id"])
          user_map[a_tweet["user"]["id"]]=a_tweet["user"]["name"]
          #print(tmp_d)
          #break
[66]: print(len(mod_list))
     10500
[67]: print(len(extra_hashtags_list))
     10286
[68]: df = pd.DataFrame(mod list)
```

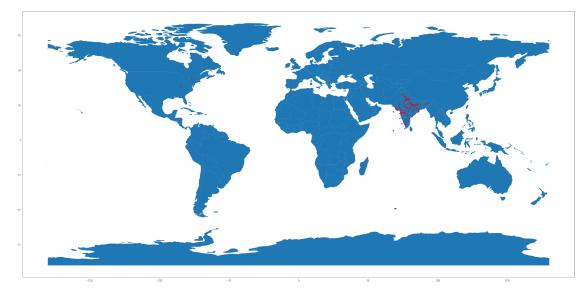
2 Analysis

```
[70]: df.columns
[70]: Index(['user_name', 'num_retweets', 'num_likes', 'lang', 'num_user_followers',
             'num_user_friends', 'num_ext_hashtags', 'num_ext_urls', 'num_ext_media',
              'text', 'is_verified', 'longitude', 'latitude'],
            dtype='object')
[71]: df.dtypes
[71]: user_name
                              object
      num_retweets
                               int64
      num_likes
                               int64
      lang
                              object
                               int64
      num_user_followers
      num_user_friends
                               int64
      num_ext_hashtags
                               int64
      num ext urls
                               int64
      num ext media
                               int64
      text
                              object
      is_verified
                              object
      longitude
                             float64
      latitude
                             float64
      dtype: object
[73]:
     df.describe()
[73]:
             num retweets
                               num likes
                                           num user followers
                                                                num user friends
             10500.000000
                            10500.000000
                                                 1.050000e+04
                                                                    10500.000000
      count
               655.819238
                                1.168095
                                                 5.808436e+03
                                                                      634.710095
      mean
                                                 1.201445e+05
                               10.243694
                                                                     1930.947001
      std
              1282.876843
      min
                 0.000000
                                0.000000
                                                 0.000000e+00
                                                                        0.000000
      25%
                  1.000000
                                0.000000
                                                 1.900000e+01
                                                                       40.000000
      50%
                                                 1.010000e+02
                 13.000000
                                0.000000
                                                                      155.000000
      75%
               205.000000
                                0.000000
                                                 5.362500e+02
                                                                      548.250000
      max
              3456.000000
                              670.000000
                                                 7.846488e+06
                                                                    82600.000000
                                                                longitude
                                                                              latitude
             num_ext_hashtags
                                num_ext_urls
                                               num_ext_media
                  10500.000000
                                10500.000000
      count
                                                10500.000000
                                                               123.000000
                                                                            123.000000
                                    0.204762
                                                                74.592504
                                                                             22.917072
      mean
                      0.979619
                                                    0.113143
      std
                                                    0.316782
                                                                20.845186
                                                                              5.699447
                      1.070771
                                    0.418380
      min
                                                               -84.820309
                      0.000000
                                    0.000000
                                                    0.000000
                                                                              6.622513
      25%
                      0.00000
                                    0.000000
                                                    0.000000
                                                                72.744840
                                                                             20.080191
      50%
                                    0.000000
                                                    0.000000
                                                                77.000000
                                                                             23.005830
                      1.000000
      75%
                      1,000000
                                    0.000000
                                                    0.000000
                                                                80.214405
                                                                             25.852856
      max
                     10.000000
                                    3.000000
                                                    1.000000
                                                                92.325090
                                                                             44.160540
```

```
[76]: df.corr()
[76]:
                          num retweets num likes num user followers \
                                        -0.056754
                              1.000000
                                                             -0.022421
     num_retweets
                             -0.056754
     num_likes
                                         1.000000
                                                             0.214843
      num_user_followers
                             -0.022421
                                         0.214843
                                                             1.000000
                                                             0.022322
      num_user_friends
                             -0.113248 -0.003896
     num_ext_hashtags
                              0.025426 -0.020572
                                                            -0.005334
                             -0.249602
                                       0.154204
                                                             0.065918
     num_ext_urls
     num_ext_media
                             -0.176193
                                         0.017473
                                                            -0.009840
      longitude
                              0.013351 -0.175504
                                                            -0.001794
                              0.084552
      latitude
                                         0.057008
                                                            -0.031984
                          num user friends
                                            num_ext_hashtags num_ext_urls
     num_retweets
                                 -0.113248
                                                    0.025426
                                                                  -0.249602
                                 -0.003896
     num likes
                                                   -0.020572
                                                                  0.154204
     num_user_followers
                                  0.022322
                                                   -0.005334
                                                                  0.065918
     num_user_friends
                                  1.000000
                                                   -0.056368
                                                                  -0.025254
     num_ext_hashtags
                                 -0.056368
                                                    1.000000
                                                                  0.016120
     num_ext_urls
                                 -0.025254
                                                    0.016120
                                                                  1.000000
      num_ext_media
                                  0.042014
                                                    0.203638
                                                                  -0.171225
      longitude
                                  0.090867
                                                                  -0.012629
                                                    0.002644
      latitude
                                 -0.124947
                                                   -0.128955
                                                                  0.054210
                          num_ext_media
                                         longitude latitude
                                          0.013351 0.084552
     num retweets
                              -0.176193
     num likes
                                         -0.175504 0.057008
                               0.017473
     num_user_followers
                              -0.009840
                                         -0.001794 -0.031984
     num_user_friends
                               0.042014
                                          0.090867 -0.124947
     num_ext_hashtags
                                          0.002644 -0.128955
                               0.203638
     num_ext_urls
                              -0.171225 -0.012629 0.054210
     num_ext_media
                               1.000000
                                          0.012049 -0.097763
                                          1.000000 -0.318445
      longitude
                               0.012049
      latitude
                              -0.097763 -0.318445 1.000000
[77]: for i in df.columns:
          print("Number of unique values for {} is {}".format(i,len(df[i].unique())))
     Number of unique values for user name is 8094
     Number of unique values for num_retweets is 94
     Number of unique values for num likes is 74
     Number of unique values for lang is 23
     Number of unique values for num_user_followers is 2219
     Number of unique values for num_user_friends is 1910
     Number of unique values for num_ext_hashtags is 11
     Number of unique values for num_ext_urls is 4
     Number of unique values for num_ext_media is 2
```

```
Number of unique values for text is 4029
Number of unique values for is_verified is 2
Number of unique values for longitude is 84
Number of unique values for latitude is 84
```

3 On magnifying, one can see that tweets related to National Mathematics Day were received from all over India (notice the red dots)



3.1 Do we get some useful correlations in the numerical fields?

```
[80]:
     df.corr()
[80]:
                          num_retweets
                                        num_likes
                                                    num_user_followers
                              1.000000
                                        -0.056754
                                                             -0.022421
      num retweets
      num_likes
                             -0.056754
                                          1.000000
                                                              0.214843
      num_user_followers
                             -0.022421
                                         0.214843
                                                              1.000000
      num_user_friends
                             -0.113248
                                        -0.003896
                                                              0.022322
     num_ext_hashtags
                              0.025426
                                        -0.020572
                                                             -0.005334
      num_ext_urls
                             -0.249602
                                         0.154204
                                                              0.065918
      num_ext_media
                             -0.176193
                                         0.017473
                                                             -0.009840
      longitude
                              0.013351
                                        -0.175504
                                                             -0.001794
      latitude
                              0.084552
                                         0.057008
                                                             -0.031984
                          num_user_friends
                                            num_ext_hashtags num_ext_urls
     num_retweets
                                  -0.113248
                                                     0.025426
                                                                  -0.249602
     num_likes
                                 -0.003896
                                                    -0.020572
                                                                   0.154204
     num_user_followers
                                  0.022322
                                                    -0.005334
                                                                   0.065918
     num_user_friends
                                  1.000000
                                                    -0.056368
                                                                  -0.025254
     num_ext_hashtags
                                                     1.000000
                                                                   0.016120
                                  -0.056368
      num_ext_urls
                                 -0.025254
                                                     0.016120
                                                                   1.000000
      num_ext_media
                                  0.042014
                                                     0.203638
                                                                  -0.171225
      longitude
                                  0.090867
                                                     0.002644
                                                                  -0.012629
      latitude
                                 -0.124947
                                                    -0.128955
                                                                   0.054210
                          num_ext_media longitude latitude
     num_retweets
                              -0.176193
                                           0.013351 0.084552
      num_likes
                                         -0.175504 0.057008
                               0.017473
      num_user_followers
                              -0.009840 -0.001794 -0.031984
     num_user_friends
                                          0.090867 -0.124947
                               0.042014
     num_ext_hashtags
                               0.203638
                                           0.002644 -0.128955
     num_ext_urls
                              -0.171225 -0.012629 0.054210
      num ext media
                               1.000000
                                           0.012049 -0.097763
      longitude
                               0.012049
                                           1.000000 -0.318445
      latitude
                              -0.097763 -0.318445 1.000000
```

3.1.1 Seeing the number of unique values

```
[81]: for i in df.columns:
    print("Number of unique values for {} is {}".format(i,len(df[i].unique())))

Number of unique values for user_name is 8094
Number of unique values for num_retweets is 94
Number of unique values for num_likes is 74
Number of unique values for lang is 23
```

```
Number of unique values for num_user_followers is 2219
Number of unique values for num_user_friends is 1910
Number of unique values for num_ext_hashtags is 11
Number of unique values for num_ext_urls is 4
Number of unique values for num_ext_media is 2
Number of unique values for text is 4029
Number of unique values for is_verified is 2
Number of unique values for longitude is 84
Number of unique values for latitude is 84
Number of unique values for geometry is 84
```

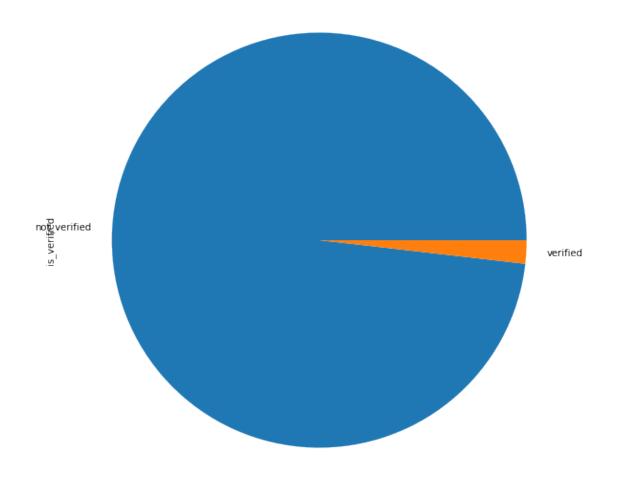
3.1.2 A brief overview of dataset

[82]: df.describe()

[02]									
[82]:		num_retweets	1	num_likes	num_	user_followers	num_user_f	riends \	
	count	10500.000000	105	00.000000		1.050000e+04	10500.	000000	
	mean	655.819238		1.168095		5.808436e+03	634.	710095	
	std	1282.876843		10.243694		1.201445e+05	1930.	947001	
	min	0.000000		0.000000		0.000000e+00	0.	000000	
	25%	1.000000		0.000000		1.900000e+01	40.	000000	
	50%	13.000000		0.000000		1.010000e+02	155.	000000	
	75%	205.000000		0.000000		5.362500e+02	548.	250000	
	max	3456.000000	6	70.000000		7.846488e+06	82600.	000000	
		num_ext_hashta	ags	num_ext_u	rls	num_ext_media	longitude	latitude	
	count	10500.000	000	10500.000	000	10500.000000	123.000000	123.000000	
	mean	0.979	619	0.204	762	0.113143	74.592504	22.917072	
	std	1.070	771	0.418	380	0.316782	20.845186	5.699447	
	min	0.000	000	0.000	000	0.000000	-84.820309	6.622513	
	25%	0.000	000	0.000	000	0.000000	72.744840	20.080191	
	50%	1.0000	000	0.000	000	0.000000	77.000000	23.005830	
	75%	1.000	000	0.000	000	0.000000	80.214405	25.852856	
	max	10.000	000	3.000	000	1.000000	92.325090	44.160540	

4 Verified users vs non-verified users

4.0.1 While the ratio of non-verified to verified users is quite large, I believe that this ratio is much higher than a general case. This seems to happen as an occassion like the 'National Mathematics Day' recieves tweets from politicians, MLAs,govt. officials etc across the country (more so than let's say a hastag of #IndiaVSAus")



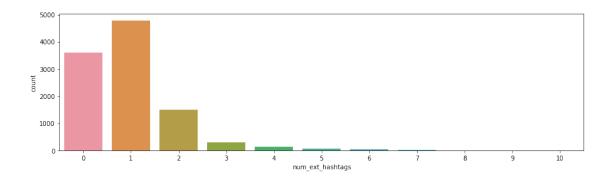
[]:

5 Hashtags

Most tweets had 0-1 hashtags.

```
[83]: #The purpose of using plt.figure() is to create a figure object.
fig = plt.figure(figsize=(15,4))
sns.countplot(x="num_ext_hashtags", data=df)
```

[83]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecb34d0750>



```
[85]: def generate_word_cloud(arr):
    d={}
    import os

    from wordcloud import WordCloud
    for i in arr:
        if i in d.keys():
            d[i]+=1
        else:
            d[i]=1
    wordcloud = WordCloud()
    wordcloud.generate_from_frequencies(frequencies=d)
    plt.figure()
    plt.imshow(wordcloud, interpolation="bilinear")
    plt.axis("off")
    plt.show()
```

6 Wordcloud based on hashtags

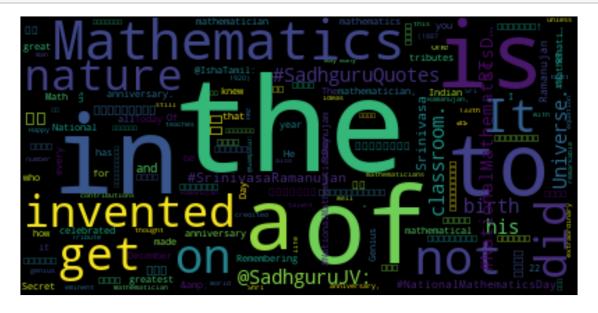
```
[86]: generate_word_cloud(extra_hashtags_list)
```

```
Mational Mathematics Day 2020 Negatives

GmaneGenius ComaneGenius Coma
```

7 Wordcloud based on text of tweets

[93]: generate_word_cloud(text_str.split(' '))



8 Number of followers trend

not_verified

verified

480.0

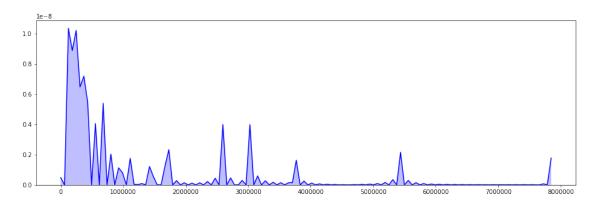
93382.5

351581.0

7846488.0

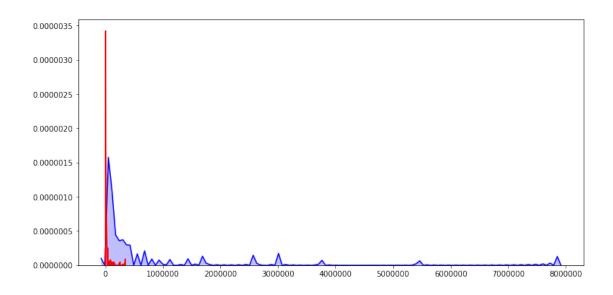
```
[96]: fig = plt.figure(figsize=(16,5))
sns.kdeplot(df['num_user_followers'],shade=True,color="b",legend=False)
```

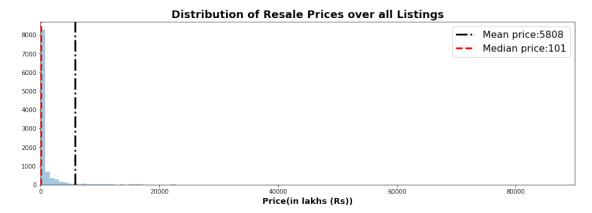
[96]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecb17bbbd0>



8.0.1 We can see that non-verified users (red) have on average much lesser number of followers than verified users (blue).

```
[99]: fig = plt.figure(figsize=(12,6))
      sns.kdeplot(df.
      →loc[(df["is_verified"]=="verified")]['num_user_followers'],shade=True,color="b",legend=Fals
      sns.kdeplot(df.
       →loc[(df["is_verified"]=="not_verified")]['num_user_followers'],shade=True,color='r',legend=
      df.groupby("is_verified")["num_user_followers"].describe()
[99]:
                      count
                                                      std
                                                                      25%
                                                                               50%
                                      mean
                                                             min
      is_verified
     not_verified
                   10309.0
                               1176.021632
                                              7030.663970
                                                             0.0
                                                                              97.0
                                                                     18.0
      verified
                      191.0
                             255837.554974 854951.020319 591.0 6114.0
                                                                          21603.0
                        75%
                                   max
      is_verified
```

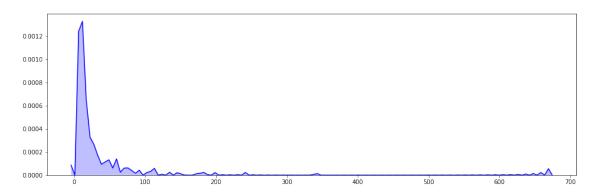




9 Number of likes trend

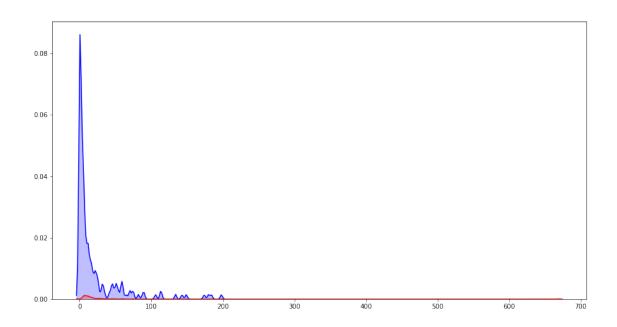
```
[100]: fig = plt.figure(figsize=(16,5))
sns.kdeplot(df['num_likes'],shade=True,color="b",legend=False,bw=1.5)
```

[100]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecb152e8d0>



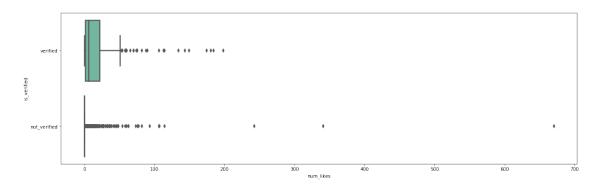
9.0.1 We can see that non-verified users (red) have on average much lesser number of likes on the tweets than verified users (blue).

[102]: 25% 50% 75% mean std min count maxis_verified not_verified 10309.0 0.800757 8.626609 0.0 0.0 0.0 670.0 0.0 verified 20.994764 36.857977 1.0 198.0 191.0 0.0 6.0 21.5



```
[103]: fig = plt.figure(figsize=(20,6)) sns.boxplot(x="num_likes",y="is_verified",data=df,linewidth=2.5,palette="Set2")
```

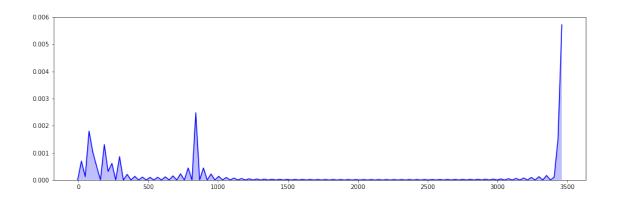
[103]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecabd61790>



10 Number of retweets trend

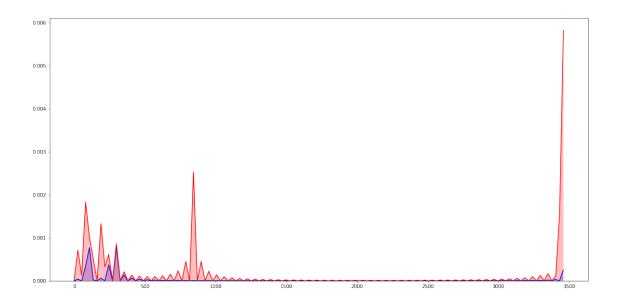
```
[104]: fig = plt.figure(figsize=(16,5))
sns.kdeplot(df['num_retweets'],shade=True,color="b",legend=False,bw=1.5)
```

[104]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecb0977dd0>



10.1 The retweets for tweets by non-verified users (seem higher) but this is misleading as let's say a non-verified (and hence, likely an unpopular user) retweets a tweet by the Prime Minister (where the original tweet by the PM itself has 1M retweets), the retweet by the non-verified user inherits the retweet count of the PM's original tweet and hence, no valid conclusions regarding retweets can be extracted.

```
[105]: fig = plt.figure(figsize=(20,10))
       sns.kdeplot(df.
        →loc[(df["is_verified"]=="verified")]['num_retweets'],shade=True,color="b",legend=False,bw=1
        →5)
       sns.kdeplot(df.
        →loc[(df["is_verified"]=="not_verified")]['num_retweets'],shade=True,color='r',legend=False,
       df.groupby("is_verified")["num_retweets"].describe()
[105]:
                        count
                                     mean
                                                    std
                                                        {\tt min}
                                                              25%
                                                                    50%
                                                                            75%
                                                                                    max
       is_verified
      not_verified
                     10309.0
                               667.336114
                                           1291.433412
                                                         0.0
                                                              1.0
                                                                   14.0
                                                                         205.0
                                                                                3456.0
       verified
                       191.0
                                34.209424
                                            252.524846
                                                        0.0
                                                              1.0
                                                                    3.0
                                                                           12.5
                                                                                3455.0
```



11 Language in which tweets were tweeted

11.0.1 Most of the tweets were in English and hindi but many languages (tweets were observed from all over the country) had their little contributions

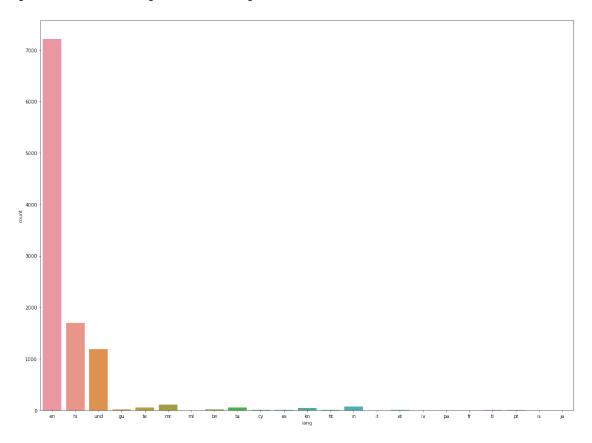
```
[110]: df['lang'].value_counts()
[110]: en
               7209
                1698
       hi
                1188
       und
                 110
       mr
                  71
        in
                  54
        te
        ta
                  54
       kn
                  45
                  17
        gu
                  15
       bn
        et
                   8
                   6
        су
       ht
                   5
                   4
        es
                   3
       pt
        tl
                   3
                   2
        is
                   2
        it
                   2
       ml
                   1
       fr
```

```
ja     1
pa     1
lv     1
```

Name: lang, dtype: int64

```
[114]: fig = plt.figure(figsize=(20,15))
sns.countplot(x="lang", data=df)
```

[114]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecb05f3150>

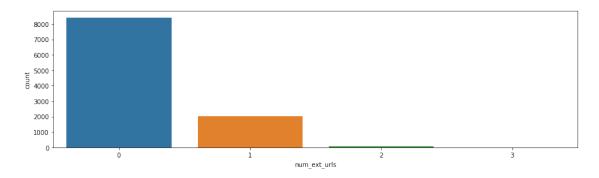


12 Number of external links provided

12.0.1 The proportion of tweets having links is higher than usual. This seems to be due to 'news channels, trivia accounts' etc providing links to their individual articles on Ramanujan and National Mathematics Day.

```
[123]: #The purpose of using plt.figure() is to create a figure object.
fig = plt.figure(figsize=(15,4))
sns.countplot(x="num_ext_urls", data=df)
```

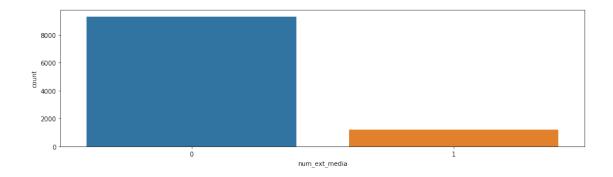
[123]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecabab6d90>



13 Number of images attached with tweets

13.0.1 Again, the number of tweets having an attached image seems higher than the usual case.

[125]: <matplotlib.axes._subplots.AxesSubplot at 0x7fecaba20d50>



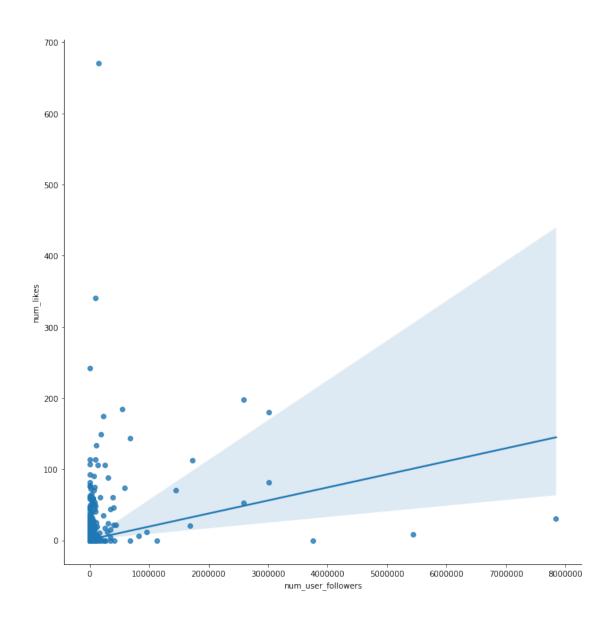
14 Correlation between likes and number of followers

14.0.1 We see that there is a decent correlation between number of followers and likes garenered by the tweet.

```
[135]: sns.

⇒lmplot('num_user_followers', 'num_likes', data=df, order=1, scatter=True, height=10, aspect=1)
```

[135]: <seaborn.axisgrid.FacetGrid at 0x7feca4375e50>



Number of connected components (Failed attempt due to failed authentication :()

```
[]: user_id_list

[]: list_set = set(user_id_list)
    # convert the set to the list
    user_id_list = (list(list_set))
```

```
[]: def is_connected(num1,num2):
         a_headers = {
         'Authorization': 'Bearer {}'.format(access_token)
         paramsa = {
             'source_id': num1,
             'target id': num2,
             'source_screen_name':user_map[num1],
             'target screen name':user map[num2]
         }
         import requests
         from requests.auth import HTTPBasicAuth
         print(paramsa)
         # https://developer.twitter.com/en/docs/twitter-api/v1/accounts-and-users/
      \rightarrow follow-search-qet-users/api-reference/qet-friendships-show
         url = 'https://api.twitter.com/1.1/friendships/lookup.json'
         resp = requests.get(url, headers=a_headers, params=paramsa,auth =__
      →HTTPBasicAuth('anmolagarwal999', '5'))
         rel=resp.json()
         print(rel)
         if rel["source"]["following"]==True or rel["source"]["followed_by"]==True:
             return True
         if rel["target"]["following"]==True or rel["target"]["followed_by"]==True:
             return True
         return False
[]: len(user_id_list)
[ ]: adj={}
     for i in range(0,len(user_id_list)):
         adj[user_id_list[i]]=[]
     for i in range(0,len(user_id_list)):
         num1=user_id_list[i]
         for j in range(i+1,len(user_id_list)):
             num2=user_id_list[j]
             if is_connected(num1,num2) == True:
                 adj[num1].append(num2)
                 adj[num2].append(num1)
[]: ""
```

[]:	
[]:	