wrangle_act

October 18, 2020

Wrangle and Analyze Data Twitter API

Analyzing And Visualizing The Tweet Archive Of Twitter User @Dog_Rates

```python
[1]: import os                 #this module routines for NT or Posix depending on what
     ↪system we're on.
     import tweepy
     import matplotlib.pyplot as plt
     import urllib.parse      # this module Parse (absolute and relative) URLs.
     import requests           # this module Requests is an HTTP library, written in
     ↪Python, for human beings. Basic GET usage:
     import pandas as pd       # this module
     import numpy as np
     import json               # this module:json exposes an API familiar to users of
     ↪the standard library module
     import time               # This module provides various functions to manipulate
     ↪time values.
     import nbconvert          # This module converting notebooks to and from different
     ↪formats
     import pyppeteer
     import pandocfilters      # This Functions to aid writing python scripts that
     ↪process the pandoc AST serialized as JSON.
     import pip

     print ("libarary-Imported")
```

```
libarary-Imported
```

```python
[2]: from tweepy.streaming import StreamListener
     from tweepy import OAuthHandler
     from tweepy import API
     from tweepy import Stream
     from tweepy import Cursor
     from tweepy.streaming import StreamListener
     from timeit import default_timer as timer
     from requests.auth import AuthBase
     from pandas.core.tools.datetimes import to_datetime
     from pandas.core.tools.timedeltas import to_timedelta
```

```python
from nbconvert import LatexExporter
from nbconvert import PDFExporter
from nbconvert import webpdf
from nbconvert import nbconvertapp
from nbconvert import templates


print ("functions-Imported")
```

functions-Imported

```python
[3]: import os
     os.getcwd()
```

[3]: 'C:\\Users\\abdel'

```python
[4]: os.chdir("G:
     ↪\Workshop_Projects\GitHub_Repositories\FWD-Udacity-Wrangle-and-Analyze-Data-Twitter-API")
```

```python
[5]: ls
```

```
 Volume in drive G is Programs
 Volume Serial Number is 0459-BFA6

 Directory of G:\Workshop_Projects\GitHub_Repositories\FWD-Udacity-Wrangle-and-
 Analyze-Data-Twitter-API

10/18/2020  01:48 PM    <DIR>          .
10/18/2020  01:48 PM    <DIR>          ..
10/12/2020  01:54 PM                66 .gitattributes
10/16/2020  03:52 PM    <DIR>          .ipynb_checkpoints
10/12/2020  02:49 PM    <DIR>          .vscode
10/17/2020  02:32 PM    <DIR>          act_report
10/18/2020  01:33 PM            15,914 dog_stages.png
10/13/2020  01:16 AM            38,329 egypt fwd initiative.jpg
10/14/2020  12:56 PM           195,293 FWD.jpg
10/18/2020  01:30 PM           335,079 image_predictions.tsv
10/18/2020  01:33 PM           930,388 main_df.csv
10/18/2020  01:31 PM               117 Popularity_of_dog.csv
10/18/2020  01:31 PM            15,629 Popularity_of_dog.png
10/14/2020  02:06 PM        10,540,363 tweet_json.txt
10/12/2020  01:45 PM        10,609,234 tweet-json
10/12/2020  01:43 PM        10,609,234 tweet-json.txt
10/12/2020  01:46 PM           614,603 tweet-json.zip
10/18/2020  01:33 PM            13,331 Twitter_source.png
10/12/2020  01:42 PM             1,764 twitter-api.py
10/12/2020  02:44 PM           915,692 twitter-archive-enhanced.csv
10/17/2020  03:31 AM    <DIR>          wrangle_act
10/18/2020  01:48 PM           320,198 wrangle_act.ipynb
```

```
10/17/2020  01:40 PM    <DIR>          wrangle_report
              16 File(s)     35,155,234 bytes
               7 Dir(s)  239,267,172,352 bytes free
```

1 1- Gathering Data for this Project

1.0.1 I- Read twitter-archive-enhanced as pandas dataframe and quick check to view structure

```
[6]: archive_df = pd.read_csv("twitter-archive-enhanced.csv")
     archive_df.set_index('tweet_id')
     archive_df.head(2)
```

```
[6]:            tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
     0  892420643555336193                    NaN                  NaN
     1  892177421306343426                    NaN                  NaN

                    timestamp  \
     0  2017-08-01 16:23:56 +0000
     1  2017-08-01 00:17:27 +0000

                                                source  \
     0  <a href="http://twitter.com/download/iphone" r…
     1  <a href="http://twitter.com/download/iphone" r…

                                              text  retweeted_status_id  \
     0  This is Phineas. He's a mystical boy. Only eve…                  NaN
     1  This is Tilly. She's just checking pup on you…                   NaN

        retweeted_status_user_id retweeted_status_timestamp  \
     0                       NaN                        NaN
     1                       NaN                        NaN

                                     expanded_urls  rating_numerator  \
     0  https://twitter.com/dog_rates/status/892420643…                13
     1  https://twitter.com/dog_rates/status/892177421…                13

        rating_denominator      name doggo floofer pupper puppo
     0                  10  Phineas  None    None   None  None
     1                  10    Tilly  None    None   None  None
```

1.0.2 II- Download tweet image predictions TSV using the Requests library and write it to image_predictions.tsv

```
[7]: url = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/
     →599fd2ad_image-predictions/image-predictions.tsv'
     response = requests.get(url)
```

```python
with open('image_predictions.tsv', mode='wb') as file:
    file.write(response.content)

# Import the tweet image predictions TSV file into a DataFrame
image_df = pd.read_csv('image_predictions.tsv', sep='\t')
image_df.set_index('tweet_id')
image_df.head(3)
```

[7]:
```
           tweet_id                                              jpg_url  \
0  666020888022790149  https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg
1  666029285002620928  https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg
2  666033412701032449  https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg

   img_num                    p1   p1_conf  p1_dog                 p2  \
0        1  Welsh_springer_spaniel  0.465074    True              collie
1        1                 redbone  0.506826    True  miniature_pinscher
2        1         German_shepherd  0.596461    True            malinois

    p2_conf  p2_dog                  p3   p3_conf  p3_dog
0  0.156665    True     Shetland_sheepdog  0.061428    True
1  0.074192    True  Rhodesian_ridgeback  0.072010    True
2  0.138584    True            bloodhound  0.116197    True
```

1.0.3 III- Query Twitter API for each tweet in the Twitter archive and save JSON in a text file

[8]:
```python
# These are hidden to comply with Twitter's API terms and conditions
consumer_key = '############################' #'HIDDEN replace #####...with␣
↪consumer_key'
consumer_secret = '##############################' #'HIDDEN replace #####...
↪with access_token'
access_token = '############################' #'HIDDEN replace #####...with␣
↪consumer_secret '
access_secret = '############################' #'HIDDEN replace #####...with␣
↪access_secret'

auth = OAuthHandler(consumer_key, consumer_secret)
auth.set_access_token(access_token, access_secret)

api = tweepy.API(auth, wait_on_rate_limit=True)

print ("ACCSESS Twitter's API")
```

```
ACCSESS Twitter's API
```

[9]:
```python
tweet_ids = archive_df.tweet_id.values
len(tweet_ids)
```

```
[9]:  2356
```

```
[40]:  # Query Twitter's API for JSON data for each tweet ID in the Twitter archive
       count = 0
       fails_dict = {}
       start = timer()
       # Save each tweet's returned JSON as a new line in a .txt file
       with open('tweet_json.txt', 'w') as outfile:
           # This loop will likely take 20-30 minutes to run because of Twitter's rate↵
       ↪limit
           for tweet_id in tweet_ids:
               count += 1
               print(str(count) + ": " + str(tweet_id))
               try:
                   tweet = api.get_status(tweet_id, tweet_mode='extended')
                   print("Success")
                   json.dump(tweet._json, outfile)
                   outfile.write('\n')
               except tweepy.TweepError as e:
                   print("Fail")
                   fails_dict[tweet_id] = e
                   pass
       end = timer()
       print(end - start)
       print(fails_dict)
```

```
1: 892420643555336193
Success
2: 892177421306343426
Success
3: 891815181378084864
Success
4: 891689557279858688
Success
5: 891327558926688256
Success
6: 891087950875897856
Success
7: 890971913173991426
Success
8: 890729181411237888
Success
9: 890609185150312448
Success
10: 890240255349198849
Success
11: 890006608113172480
Success
```

```
12: 889880896479866881
Success
13: 889665388333682689
Success
14: 889638837579907072
Success
15: 889531135344209921
Success
16: 889278841981685760
Success
17: 888917238123831296
Success
18: 888804989199671297
Success
19: 888554962724278272
Success
20: 888202515573088257
Fail
21: 888078434458587136
Success
22: 887705289381826560
Success
23: 887517139158093824
Success
24: 887473957103951883
Success
25: 887343217045368832
Success
26: 887101392804085760
Success
27: 886983233522544640
Success
28: 886736880519319552
Success
29: 886680336477933568
Success
30: 886366144734445568
Success
31: 886267009285017600
Success
32: 886258384151887873
Success
33: 886054160059072513
Success
34: 885984800019947520
Success
35: 885528943205470208
Success
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```
36: 885518971528720385
Success
37: 885311592912609280
Success
38: 885167619883638784
Success
39: 884925521741709313
Success
40: 884876753390489601
Success
41: 884562892145688576
Success
42: 884441805382717440
Success
43: 884247878851493888
Success
44: 884162670584377345
Success
45: 883838122936631299
Success
46: 883482846933004288
Success
47: 883360690899218434
Success
48: 883117836046086144
Success
49: 882992080364220416
Success
50: 882762694511734784
Success
51: 882627270321602560
Success
52: 882268110199369728
Success
53: 882045870035918850
Success
54: 881906580714921986
Success
55: 881666595344535552
Success
56: 881633300179243008
Success
57: 881536004380872706
Success
58: 881268444196462592
Success
59: 880935762899988482
Success
```

```
60: 880872448815771648
Success
61: 880465832366813184
Success
62: 880221127280381952
Success
63: 880095782870896641
Success
64: 879862464715927552
Success
65: 879674319642796034
Success
66: 879492040517615616
Success
67: 879415818425184262
Success
68: 879376492567855104
Success
69: 879130579576475649
Success
70: 879050749262655488
Success
71: 879008229531029506
Success
72: 878776093423087618
Success
73: 878604707211726852
Success
74: 878404777348136964
Success
75: 878316110768087041
Success
76: 878281511006478336
Success
77: 878057613040115712
Success
78: 877736472329191424
Success
79: 877611172832227328
Success
80: 877556246731214848
Success
81: 877316821321428993
Success
82: 877201837425926144
Success
83: 876838120628539392
Success
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84: 876537666061221889
Success
85: 876484053909872640
Success
86: 876120275196170240
Success
87: 875747767867523072
Success
88: 875144289856114688
Success
89: 875097192612077568
Success
90: 875021211251597312
Success
91: 874680097055178752
Success
92: 874434818259525634
Success
93: 874296783580663808
Success
94: 874057562936811520
Success
95: 874012996292530176
Success
96: 873697596434513921
Fail
97: 873580283840344065
Success
98: 873337748698140672
Success
99: 873213775632977920
Success
100: 872967104147763200
Success
101: 872820683541237760
Success
102: 872668790621863937
Fail
103: 872620804844003328
Success
104: 872486979161796608
Success
105: 872261713294495745
Fail
106: 872122724285648897
Success
107: 871879754684805121
Success

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108: 871762521631449091
Success
109: 871515927908634625
Success
110: 871166179821445120
Success
111: 871102520638267392
Success
112: 871032628920680449
Success
113: 870804317367881728
Success
114: 870726314365509632
Success
115: 870656317836468226
Success
116: 870374049280663552
Success
117: 870308999962521604
Success
118: 870063196459192321
Success
119: 869988702071779329
Fail
120: 869772420881756160
Success
121: 869702957897576449
Success
122: 869596645499047938
Success
123: 869227993411051520
Success
124: 868880397819494401
Success
125: 868639477480148993
Success
126: 868622495443632128
Success
127: 868552278524837888
Success
128: 867900495410671616
Success
129: 867774946302451713
Success
130: 867421006826221569
Success
131: 867072653475098625
Success
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Success
133: 866816280283807744
Fail
134: 866720684873056260
Success
135: 866686824827068416
Success
136: 866450705531457537
Success
137: 866334964761202691
Success
138: 866094527597207552
Success
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151: 863062471531167744
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152: 862831371563274240
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153: 862722525377298433
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155: 862096992088072192
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285: 838921590096166913
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Success
291: 838150277551247360
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292: 838085839343206401
Success
293: 838083903487373313
Success
294: 837820167694528512
Success
295: 837482249356513284
Success
296: 837471256429613056
Success
297: 837366284874571778
Fail
298: 837110210464448512
Success
299: 837012587749474308
Fail
```

```
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Success
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Success
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Success
305: 836380477523124226
Success
306: 836260088725786625
Success
307: 836001077879255040
Success
308: 835685285446955009
Success
309: 835574547218894849
Success
310: 835536468978302976
Success
311: 835309094223372289
Success
312: 835297930240217089
Success
313: 835264098648616962
Success
314: 835246439529840640
Success
315: 835172783151792128
Success
316: 835152434251116546
Success
317: 834931633769889797
Success
318: 834786237630337024
Success
319: 834574053763584002
Success
320: 834477809192075265
Success
321: 834458053273591808
Success
322: 834209720923721728
Success
323: 834167344700198914
Success
```

```
324: 834089966724603904
Success
325: 834086379323871233
Success
326: 833863086058651648
Success
327: 833826103416520705
Success
328: 833732339549220864
Success
329: 833722901757046785
Success
330: 833479644947025920
Success
331: 833124694597443584
Success
332: 832998151111966721
Success
333: 832769181346996225
Success
334: 832757312314028032
Success
335: 832682457690300417
Success
336: 832645525019123713
Success
337: 832636094638288896
Success
338: 832397543355072512
Success
339: 832369877331693569
Success
340: 832273440279240704
Success
341: 832215909146226688
Success
342: 832215726631055365
Success
343: 832088576586297345
Success
344: 832040443403784192
Success
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Success
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Success
```

```
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Success
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authorized to see this status.'}]), 770743923962707968: TweepError([{'code':
144, 'message': 'No status found with that ID.'}]), 759566828574212096:
TweepError([{'code': 144, 'message': 'No status found with that ID.'}]),
754011816964026368: TweepError([{'code': 144, 'message': 'No status found with
that ID.'}]), 680055455951884288: TweepError([{'code': 144, 'message': 'No
status found with that ID.'}])}

```
[10]: ## read json file to a list array and strip new line charactor
      lines = [line.rstrip('\n') for line in open('tweet_json.txt')]
      # read one tweet into a temp file to examine its content
      # load the tweet into a json format for easier extraction of information
      temp = json.loads(lines[0])
```

```
[11]: temp
```

[11]: {'created_at': 'Tue Aug 01 16:23:56 +0000 2017',
 'id': 892420643555336193,
 'id_str': '892420643555336193',
 'full_text': "This is Phineas. He's a mystical boy. Only ever appears in the
hole of a donut. 13/10 https://t.co/MgUWQ76dJU",
 'truncated': False,
 'display_text_range': [0, 85],
 'entities': {'hashtags': [],
  'symbols': [],
  'user_mentions': [],
  'urls': [],
  'media': [{'id': 892420639486877696,
    'id_str': '892420639486877696',
    'indices': [86, 109],
    'media_url': 'http://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg',
    'media_url_https': 'https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg',
    'url': 'https://t.co/MgUWQ76dJU',
    'display_url': 'pic.twitter.com/MgUWQ76dJU',
    'expanded_url':

'https://twitter.com/dog_rates/status/892420643555336193/photo/1',
    'type': 'photo',
    'sizes': {'thumb': {'w': 150, 'h': 150, 'resize': 'crop'},
     'medium': {'w': 540, 'h': 528, 'resize': 'fit'},
     'small': {'w': 540, 'h': 528, 'resize': 'fit'},
     'large': {'w': 540, 'h': 528, 'resize': 'fit'}}}]},
  'extended_entities': {'media': [{'id': 892420639486877696,
    'id_str': '892420639486877696',
    'indices': [86, 109],
    'media_url': 'http://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg',
    'media_url_https': 'https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg',
    'url': 'https://t.co/MgUWQ76dJU',
    'display_url': 'pic.twitter.com/MgUWQ76dJU',
    'expanded_url':
'https://twitter.com/dog_rates/status/892420643555336193/photo/1',
    'type': 'photo',
    'sizes': {'thumb': {'w': 150, 'h': 150, 'resize': 'crop'},
     'medium': {'w': 540, 'h': 528, 'resize': 'fit'},
     'small': {'w': 540, 'h': 528, 'resize': 'fit'},
     'large': {'w': 540, 'h': 528, 'resize': 'fit'}}}]},
 'source': 'Twitter
for iPhone',
 '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': 4196983835,
  'id_str': '4196983835',
  'name': 'WeRateDogs®',
  'screen_name': 'dog_rates',
  'location': 'Adoptable Dogs ',
  'description': 'Your Only Source For Professional Dog Ratings Instagram and
Facebook WeRateDogs partnerships@weratedogs.com   ',
  'url': 'https://t.co/4W7xbIw5dg',
  'entities': {'url': {'urls': [{'url': 'https://t.co/4W7xbIw5dg',
     'expanded_url': 'https://campsite.bio/weratedogs',
     'display_url': 'campsite.bio/weratedogs',
     'indices': [0, 23]}]},
   'description': {'urls': []}},
  'protected': False,
  'followers_count': 8869667,
  'friends_count': 18,
  'listed_count': 5915,
  'created_at': 'Sun Nov 15 21:41:29 +0000 2015',
  'favourites_count': 145994,
  'utc_offset': None,

```
    'time_zone': None,
    'geo_enabled': True,
    'verified': True,
    'statuses_count': 12955,
    'lang': None,
    'contributors_enabled': False,
    'is_translator': False,
    'is_translation_enabled': False,
    'profile_background_color': '000000',
    '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/1311690208509747200/KngeU1O9_normal.jpg',
    'profile_image_url_https':
'https://pbs.twimg.com/profile_images/1311690208509747200/KngeU1O9_normal.jpg',
    'profile_banner_url':
'https://pbs.twimg.com/profile_banners/4196983835/1591077312',
    'profile_link_color': 'F5ABB5',
    'profile_sidebar_border_color': '000000',
    'profile_sidebar_fill_color': '000000',
    'profile_text_color': '000000',
    'profile_use_background_image': False,
    'has_extended_profile': False,
    'default_profile': False,
    'default_profile_image': False,
    'following': True,
    'follow_request_sent': False,
    'notifications': False,
    'translator_type': 'none'},
  'geo': None,
  'coordinates': None,
  'place': None,
  'contributors': None,
  'is_quote_status': False,
  'retweet_count': 7510,
  'favorite_count': 35521,
  'favorited': False,
  'retweeted': False,
  'possibly_sensitive': False,
  'possibly_sensitive_appealable': False,
  'lang': 'en'}
```

```python
[12]: # List of dictionaries to read tweet's JSON data line by line and later convert
      ↪to a DataFrame
```

```
df_list = []
with open('tweet_json.txt', 'r') as json_file:
    for line in json_file:
        tweet_df = json.loads(line)

        # Append to list of dictionaries
        df_list.append({'tweet_id': tweet_df['id'],
                        'retweet_count': tweet_df['retweet_count'],
                        'favorite_count': tweet_df['favorite_count'],
                        'display_text_range': tweet_df['display_text_range'],
                        'place':tweet_df['place'],
                        'created_at': tweet_df['created_at']

                        })

# Create a DataFrame with tweet ID, retweet count, favorite count and␣
 ↪display_text_range
tweet_df  = pd.DataFrame(df_list, columns =␣
 ↪['created_at','tweet_id','place','retweet_count', 'favorite_count',␣
 ↪'display_text_range'])
```

[13]:
```
tweet_df.head(2)
```

[13]:
```
                      created_at            tweet_id place  retweet_count  \
0  Tue Aug 01 16:23:56 +0000 2017  892420643555336193  None           7510
1  Tue Aug 01 00:17:27 +0000 2017  892177421306343426  None           5574

   favorite_count display_text_range
0           35521           [0, 85]
1           30744          [0, 138]
```

[14]:
```
tweet_df.rename(columns={'created_at':'timestamp'},inplace=True)
tweet_df.set_index('tweet_id')
tweet_df.head(2)
```

[14]:
```
                       timestamp            tweet_id place  retweet_count  \
0  Tue Aug 01 16:23:56 +0000 2017  892420643555336193  None           7510
1  Tue Aug 01 00:17:27 +0000 2017  892177421306343426  None           5574

   favorite_count display_text_range
0           35521           [0, 85]
1           30744          [0, 138]
```

2 2-Assessing Data for this Project

```
[15]: image_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2075 entries, 0 to 2074
Data columns (total 12 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   tweet_id  2075 non-null   int64
 1   jpg_url   2075 non-null   object
 2   img_num   2075 non-null   int64
 3   p1        2075 non-null   object
 4   p1_conf   2075 non-null   float64
 5   p1_dog    2075 non-null   bool
 6   p2        2075 non-null   object
 7   p2_conf   2075 non-null   float64
 8   p2_dog    2075 non-null   bool
 9   p3        2075 non-null   object
 10  p3_conf   2075 non-null   float64
 11  p3_dog    2075 non-null   bool
dtypes: bool(3), float64(3), int64(2), object(4)
memory usage: 152.1+ KB
```

2.0.1 Quality Issues

```
[16]: tweet_df.info()    #1-place columan almost empty
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2331 entries, 0 to 2330
Data columns (total 6 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   timestamp           2331 non-null   object
 1   tweet_id            2331 non-null   int64
 2   place               1 non-null      object
 3   retweet_count       2331 non-null   int64
 4   favorite_count      2331 non-null   int64
 5   display_text_range  2331 non-null   object
dtypes: int64(3), object(3)
memory usage: 109.4+ KB
```

```
[17]: tweet_df.tweet_id .duplicated    # 2-there is no dublicate in tweeter data frame
```

```
[17]: <bound method Series.duplicated of 0        892420643555336193
      1        892177421306343426
      2        891815181378084864
      3        891689557279858688
```

```
4       891327558926688256
              …
2326    666049248165822465
2327    666044226329800704
2328    666033412701032449
2329    666029285002620928
2330    666020888022790149
Name: tweet_id, Length: 2331, dtype: int64>
```

[18]: `tweet_df.dtypes`

[18]:
```
timestamp             object
tweet_id               int64
place                 object
retweet_count          int64
favorite_count         int64
display_text_range    object
dtype: object
```

[19]: `archive_df.info()` *#3-many columan have null value*

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2356 entries, 0 to 2355
Data columns (total 17 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   tweet_id                    2356 non-null   int64
 1   in_reply_to_status_id       78 non-null     float64
 2   in_reply_to_user_id         78 non-null     float64
 3   timestamp                   2356 non-null   object
 4   source                      2356 non-null   object
 5   text                        2356 non-null   object
 6   retweeted_status_id         181 non-null    float64
 7   retweeted_status_user_id    181 non-null    float64
 8   retweeted_status_timestamp  181 non-null    object
 9   expanded_urls               2297 non-null   object
 10  rating_numerator            2356 non-null   int64
 11  rating_denominator          2356 non-null   int64
 12  name                        2356 non-null   object
 13  doggo                       2356 non-null   object
 14  floofer                     2356 non-null   object
 15  pupper                      2356 non-null   object
 16  puppo                       2356 non-null   object
dtypes: float64(4), int64(3), object(10)
memory usage: 313.0+ KB
```

[20]: `name_count=archive_df.name.value_counts()` *#4-there is a name with*
   `↪just "a" letter`

```
print(name_count.unique)
```

```
<bound method Series.unique of None      745
a            55
Charlie      12
Lucy         11
Cooper       11
             …
Rinna         1
Diogi         1
Molly         1
Iggy          1
Carll         1
Name: name, Length: 957, dtype: int64>
```

[21]: `archive_df.columns`

[21]: Index(['tweet_id', 'in_reply_to_status_id', 'in_reply_to_user_id', 'timestamp',
       'source', 'text', 'retweeted_status_id', 'retweeted_status_user_id',
       'retweeted_status_timestamp', 'expanded_urls', 'rating_numerator',
       'rating_denominator', 'name', 'doggo', 'floofer', 'pupper', 'puppo'],
      dtype='object')

[22]: `archive_df.dtypes`

[22]:
```
tweet_id                         int64
in_reply_to_status_id          float64
in_reply_to_user_id            float64
timestamp                       object
source                          object
text                            object
retweeted_status_id            float64
retweeted_status_user_id       float64
retweeted_status_timestamp      object
expanded_urls                   object
rating_numerator                 int64
rating_denominator               int64
name                            object
doggo                           object
floofer                         object
pupper                          object
puppo                           object
dtype: object
```

[23]: `archive_df.rating_numerator.value_counts()`   *#5-there is number not in the*
      ↪rating range(0-10)
```

```
[23]: 12       558
      11       464
      10       461
      13       351
      9        158
      8        102
      7         55
      14        54
      5         37
      6         32
      3         19
      4         17
      1          9
      2          9
      420        2
      0          2
      15         2
      75         2
      80         1
      20         1
      24         1
      26         1
      44         1
      50         1
      60         1
      165        1
      84         1
      88         1
      144        1
      182        1
      143        1
      666        1
      960        1
      1776       1
      17         1
      27         1
      45         1
      99         1
      121        1
      204        1
      Name: rating_numerator, dtype: int64
```

```
[24]: archive_df.rating_denominator .value_counts()    #5-there is number not in the␣
      ↪rating range(0-10)
```

```
[24]: 10      2333
      11         3
```

```
50         3
80         2
20         2
2          1
16         1
40         1
70         1
15         1
90         1
110        1
120        1
130        1
150        1
170        1
7          1
0          1
Name: rating_denominator, dtype: int64
```

3   3-Cleaning Data for this Project:

```
[25]: #copy of the dataframe:
      tweet_df_clean=tweet_df.copy()
      archive_df_clean=archive_df.copy()
      image_df_clean=image_df.copy()
```

```
[26]: tweet_df_clean.head(1)
```

```
[26]:                          timestamp            tweet_id place  retweet_count  \
      0  Tue Aug 01 16:23:56 +0000 2017   892420643555336193  None           7510

         favorite_count display_text_range
      0           35521             [0, 85]
```

```
[27]: image_df_clean.head(1)
```

```
[27]:            tweet_id                                       jpg_url  \
      0  666020888022790149  https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg

         img_num                    p1   p1_conf  p1_dog      p2   p2_conf  \
      0        1  Welsh_springer_spaniel  0.465074    True  collie  0.156665

         p2_dog                p3   p3_conf  p3_dog
      0    True  Shetland_sheepdog  0.061428    True
```

```
[28]: archive_df_clean.head(1)
```

```
[28]:              tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
       0  892420643555336193                    NaN                  NaN

                      timestamp  \
       0  2017-08-01 16:23:56 +0000

                                                    source  \
       0  <a href="http://twitter.com/download/iphone" r…

                                                       text  retweeted_status_id  \
       0  This is Phineas. He's a mystical boy. Only eve…                    NaN

           retweeted_status_user_id retweeted_status_timestamp  \
       0                        NaN                        NaN

                                        expanded_urls  rating_numerator  \
       0  https://twitter.com/dog_rates/status/892420643…                13

           rating_denominator     name doggo floofer pupper puppo
       0                   10  Phineas  None    None   None  None
```

3.1 Drop Rows with Missing Values

```python
[29]: # Dropping column with missing value
      tweet_df_clean.drop(['place'], axis=1, inplace=True)
```

```python
[30]: #view missing value count for tweet_df
      tweet_df_clean.isnull().sum()
```

```
[30]: timestamp            0
      tweet_id             0
      retweet_count        0
      favorite_count       0
      display_text_range   0
      dtype: int64
```

```python
[31]: # explore data with name a
      archive_df_clean_v2=archive_df_clean.loc[archive_df_clean['name'] =='a']
      archive_df_clean_v2.head(2)
```

```
[31]:             tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
       56   881536004380872706                    NaN                  NaN
       649  792913359805018113                    NaN                  NaN

                       timestamp  \
       56   2017-07-02 15:32:16 +0000
       649  2016-10-31 02:17:31 +0000
```

```
                                                                  source  \
      56  <a href="http://twitter.com/download/iphone" r…
      649  <a href="http://twitter.com/download/iphone" r…


                                              text  retweeted_status_id  \
      56   Here is a pupper approaching maximum borkdrive…                 NaN
      649  Here is a perfect example of someone who has t…                 NaN


            retweeted_status_user_id retweeted_status_timestamp  \
      56                         NaN                        NaN
      649                        NaN                        NaN


                                        expanded_urls  rating_numerator  \
      56   https://twitter.com/dog_rates/status/881536004…                14
      649  https://twitter.com/dog_rates/status/792913359…                13


            rating_denominator name doggo floofer  pupper puppo
      56                    10    a  None    None  pupper  None
      649                   10    a  None    None    None  None
```

```python
#raplace a with name "apple" so we not lost mush more data
archive_df_clean.loc[archive_df_clean['name'] == 'a', 'name'] = 'APPLE'
archive_df_clean.head(2)
```

```
[32]:             tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
      0  892420643555336193                    NaN                  NaN
      1  892177421306343426                    NaN                  NaN


                       timestamp  \
      0  2017-08-01 16:23:56 +0000
      1  2017-08-01 00:17:27 +0000


                                                 source  \
      0  <a href="http://twitter.com/download/iphone" r…
      1  <a href="http://twitter.com/download/iphone" r…


                                              text  retweeted_status_id  \
      0  This is Phineas. He's a mystical boy. Only eve…                 NaN
      1  This is Tilly. She's just checking pup on you…                 NaN


            retweeted_status_user_id retweeted_status_timestamp  \
      0                         NaN                        NaN
      1                         NaN                        NaN


                                        expanded_urls  rating_numerator  \
      0  https://twitter.com/dog_rates/status/892420643…                13
```

```
1  https://twitter.com/dog_rates/status/892177421…                    13
```

```
   rating_denominator      name doggo floofer pupper puppo
0                    10  Phineas  None    None   None  None
1                    10    Tilly  None    None   None  None
```

[33]:
```python
name_count=archive_df_clean.name.value_counts() #6-after replace "a"with "apple"
print(name_count.unique)
```

```
<bound method Series.unique of None       745
APPLE         55
Charlie       12
Lucy          11
Cooper        11
              …
Rinna          1
Diogi          1
Molly          1
Iggy           1
Carll          1
Name: name, Length: 957, dtype: int64>
```

[34]:
```python
# view missing value count for archive
archive_df_clean.isnull().sum()
```

[34]:
```
tweet_id                        0
in_reply_to_status_id        2278
in_reply_to_user_id          2278
timestamp                       0
source                          0
text                            0
retweeted_status_id          2175
retweeted_status_user_id     2175
retweeted_status_timestamp   2175
expanded_urls                  59
rating_numerator                0
rating_denominator              0
name                            0
doggo                           0
floofer                         0
pupper                          0
puppo                           0
dtype: int64
```

[35]:
```python
archive_df_clean.drop(['retweeted_status_id'], axis=1, inplace=True)     #7-drop␣
 ↪empty column
archive_df_clean.drop(['retweeted_status_user_id' ], axis=1, inplace=True)
archive_df_clean.drop(['retweeted_status_timestamp'], axis=1, inplace=True)
```

```
archive_df_clean.drop(['in_reply_to_status_id'], axis=1, inplace=True)
archive_df_clean.drop(['in_reply_to_user_id'], axis=1, inplace=True)
```

[36]:
```
archive_df_clean.count()
```

[36]:
```
tweet_id              2356
timestamp             2356
source                2356
text                  2356
expanded_urls         2297
rating_numerator      2356
rating_denominator    2356
name                  2356
doggo                 2356
floofer               2356
pupper                2356
puppo                 2356
dtype: int64
```

[37]:
```
archive_df_clean.head(2)
```

[37]:
```
            tweet_id                   timestamp  \
0  892420643555336193  2017-08-01 16:23:56 +0000
1  892177421306343426  2017-08-01 00:17:27 +0000

                                             source  \
0  <a href="http://twitter.com/download/iphone" r…
1  <a href="http://twitter.com/download/iphone" r…

                                               text  \
0  This is Phineas. He's a mystical boy. Only eve…
1  This is Tilly. She's just checking pup on you…

                           expanded_urls  rating_numerator  \
0  https://twitter.com/dog_rates/status/892420643…                13
1  https://twitter.com/dog_rates/status/892177421…                13

   rating_denominator     name doggo floofer pupper puppo
0                  10  Phineas  None    None   None  None
1                  10    Tilly  None    None   None  None
```

[38]:
```
#raplace a with name "rating_numerator" with mean
archive_df_clean.loc[archive_df_clean['rating_numerator'] > 13 ,␣
 ↪'rating_numerator'] = 13
archive_df_clean.rating_numerator.value_counts()
```

```
[38]: 12    558
      11    464
      10    461
      13    433
      9     158
      8     102
      7      55
      5      37
      6      32
      3      19
      4      17
      1       9
      2       9
      0       2
      Name: rating_numerator, dtype: int64
```

```
[39]: #raplace a with name "rating_denominator" with mean
      archive_df_clean.loc[archive_df_clean['rating_denominator'] > 20,␣
       ↪'rating_denominator'] = 10
      archive_df_clean.rating_denominator.value_counts()
```

```
[39]: 10    2346
      11       3
      20       2
      15       1
      7        1
      16       1
      2        1
      0        1
      Name: rating_denominator, dtype: int64
```

```
[40]: # view missing value count for archive
      archive_df_clean.isnull().sum()
```

```
[40]: tweet_id             0
      timestamp            0
      source               0
      text                 0
      expanded_urls       59
      rating_numerator     0
      rating_denominator   0
      name                 0
      doggo                0
      floofer              0
      pupper               0
      puppo                0
      dtype: int64
```

```
[41]: archive_df.describe()
```

```
[41]:           tweet_id   in_reply_to_status_id   in_reply_to_user_id  \
      count  2.356000e+03            7.800000e+01          7.800000e+01
      mean   7.427716e+17            7.455079e+17          2.014171e+16
      std    6.856705e+16            7.582492e+16          1.252797e+17
      min    6.660209e+17            6.658147e+17          1.185634e+07
      25%    6.783989e+17            6.757419e+17          3.086374e+08
      50%    7.196279e+17            7.038708e+17          4.196984e+09
      75%    7.993373e+17            8.257804e+17          4.196984e+09
      max    8.924206e+17            8.862664e+17          8.405479e+17

             retweeted_status_id   retweeted_status_user_id   rating_numerator  \
      count          1.810000e+02               1.810000e+02        2356.000000
      mean           7.720400e+17               1.241698e+16          13.126486
      std            6.236928e+16               9.599254e+16          45.876648
      min            6.661041e+17               7.832140e+05           0.000000
      25%            7.186315e+17               4.196984e+09          10.000000
      50%            7.804657e+17               4.196984e+09          11.000000
      75%            8.203146e+17               4.196984e+09          12.000000
      max            8.874740e+17               7.874618e+17        1776.000000

             rating_denominator
      count          2356.000000
      mean             10.455433
      std               6.745237
      min               0.000000
      25%              10.000000
      50%              10.000000
      75%              10.000000
      max             170.000000
```

```
[42]: archive_df_clean.describe()  # 8 -data for␣
      ↪rating_numerator        rating_denominator didnot change after cleaning
```

```
[42]:           tweet_id   rating_numerator   rating_denominator
      count  2.356000e+03        2356.000000          2356.000000
      mean   7.427716e+17          10.692275            10.005518
      std    6.856705e+16           2.162202             0.430734
      min    6.660209e+17           0.000000             0.000000
      25%    6.783989e+17          10.000000            10.000000
      50%    7.196279e+17          11.000000            10.000000
      75%    7.993373e+17          12.000000            10.000000
      max    8.924206e+17          13.000000            20.000000
```

```
[43]: #explore expanded_urls value
      archive_df_clean.expanded_urls.unique()
```

```
[43]: array(['https://twitter.com/dog_rates/status/892420643555336193/photo/1',
              'https://twitter.com/dog_rates/status/892177421306343426/photo/1',
              'https://twitter.com/dog_rates/status/891815181378084864/photo/1',
              ...,
              'https://twitter.com/dog_rates/status/666033412701032449/photo/1',
              'https://twitter.com/dog_rates/status/666029285002620928/photo/1',
              'https://twitter.com/dog_rates/status/666020888022790149/photo/1'],
             dtype=object)
```

```
[44]: # view missing value count for image
      image_df_clean.isnull().sum()
```

```
[44]: tweet_id    0
      jpg_url     0
      img_num     0
      p1          0
      p1_conf     0
      p1_dog      0
      p2          0
      p2_conf     0
      p2_dog      0
      p3          0
      p3_conf     0
      p3_dog      0
      dtype: int64
```

```
[45]: image_df_clean.value_counts
```

```
[45]: <bound method DataFrame.value_counts of                    tweet_id
      jpg_url  \
      0      666020888022790149  https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg
      1      666029285002620928  https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg
      2      666033412701032449  https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg
      3      666044226329800704  https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg
      4      666049248165822465  https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg
      ...                   ...                                              ...
      2070   891327558926688256  https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg
      2071   891689557279858688  https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg
      2072   891815181378084864  https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg
      2073   892177421306343426  https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg
      2074   892420643555336193  https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg

             img_num                     p1  p1_conf  p1_dog                 p2  \
      0            1  Welsh_springer_spaniel  0.465074    True             collie
      1            1                 redbone  0.506826    True  miniature_pinscher
      2            1         German_shepherd  0.596461    True           malinois
      3            1      Rhodesian_ridgeback  0.408143    True            redbone
```

```
4            1       miniature_pinscher  0.560311     True          Rottweiler
...          ...                          ...          ...          ...                 ...
2070         2                   basset  0.555712     True     English_springer
2071         1              paper_towel  0.170278    False   Labrador_retriever
2072         1                Chihuahua  0.716012     True             malamute
2073         1                Chihuahua  0.323581     True             Pekinese
2074         1                   orange  0.097049    False                bagel

        p2_conf  p2_dog                          p3   p3_conf  p3_dog
0      0.156665    True        Shetland_sheepdog   0.061428    True
1      0.074192    True        Rhodesian_ridgeback 0.072010    True
2      0.138584    True                bloodhound   0.116197    True
3      0.360687    True         miniature_pinscher 0.222752    True
4      0.243682    True                  Doberman   0.154629    True
...         ...     ...                       ...        ...     ...
2070   0.225770    True   German_short-haired_pointer 0.175219    True
2071   0.168086    True                   spatula   0.040836   False
2072   0.078253    True                    kelpie   0.031379    True
2073   0.090647    True                  papillon   0.068957    True
2074   0.085851   False                    banana   0.076110   False

[2075 rows x 12 columns]>
```

3.1.1 tidiness issues

```
[46]: archive_df_clean.shape
```

```
[46]: (2356, 12)
```

```
[47]: archive_df_clean.columns
```

```
[47]: Index(['tweet_id', 'timestamp', 'source', 'text', 'expanded_urls',
              'rating_numerator', 'rating_denominator', 'name', 'doggo', 'floofer',
              'pupper', 'puppo'],
             dtype='object')
```

```
[48]: tweet_df_clean.shape
```

```
[48]: (2331, 5)
```

```
[49]: tweet_df_clean.columns
```

```
[49]: Index(['timestamp', 'tweet_id', 'retweet_count', 'favorite_count',
              'display_text_range'],
             dtype='object')
```

```
[50]: archive_df_clean.drop(['timestamp'], axis=1, inplace=True)
      archive_df_clean.head(3)
```

```
[50]:              tweet_id                                         source  \
    0  892420643555336193   <a href="http://twitter.com/download/iphone" r…
    1  892177421306343426   <a href="http://twitter.com/download/iphone" r…
    2  891815181378084864   <a href="http://twitter.com/download/iphone" r…

                                                    text  \
    0  This is Phineas. He's a mystical boy. Only eve…
    1  This is Tilly. She's just checking pup on you…
    2  This is Archie. He is a rare Norwegian Pouncin…

                                     expanded_urls  rating_numerator  \
    0  https://twitter.com/dog_rates/status/892420643…                13
    1  https://twitter.com/dog_rates/status/892177421…                13
    2  https://twitter.com/dog_rates/status/891815181…                12

       rating_denominator      name doggo floofer pupper puppo
    0                  10   Phineas  None    None   None  None
    1                  10     Tilly  None    None   None  None
    2                  10    Archie  None    None   None  None
```

```
[51]:  # marge tweet_df_clean and archive_df_clean
       tweet_df_merge = pd.merge(archive_df_clean, tweet_df_clean ,on='tweet_id')
       tweet_df_merge.set_index('tweet_id')
       tweet_df_merge.head(3)
```

```
[51]:              tweet_id                                         source  \
    0  892420643555336193   <a href="http://twitter.com/download/iphone" r…
    1  892177421306343426   <a href="http://twitter.com/download/iphone" r…
    2  891815181378084864   <a href="http://twitter.com/download/iphone" r…

                                                    text  \
    0  This is Phineas. He's a mystical boy. Only eve…
    1  This is Tilly. She's just checking pup on you…
    2  This is Archie. He is a rare Norwegian Pouncin…

                                     expanded_urls  rating_numerator  \
    0  https://twitter.com/dog_rates/status/892420643…                13
    1  https://twitter.com/dog_rates/status/892177421…                13
    2  https://twitter.com/dog_rates/status/891815181…                12

       rating_denominator      name doggo floofer pupper puppo  \
    0                  10   Phineas  None    None   None  None
    1                  10     Tilly  None    None   None  None
    2                  10    Archie  None    None   None  None

                        timestamp  retweet_count  favorite_count  \
    0  Tue Aug 01 16:23:56 +0000 2017           7510           35521
```

```
1  Tue Aug 01 00:17:27 +0000 2017                 5574                 30744
2  Mon Jul 31 00:18:03 +0000 2017                 3690                 23113


   display_text_range
0            [0, 85]
1           [0, 138]
2           [0, 121]
```

[52]: `tweet_df_merge.shape`

[52]: (2331, 15)

[53]: `tweet_df_merge.describe()`

[53]:
```
              tweet_id  rating_numerator  rating_denominator  retweet_count  \
count  2.331000e+03         2331.000000         2331.000000    2331.000000
mean   7.419079e+17           10.675676           10.005148    2642.187044
std    6.823170e+16            2.164363            0.432548    4468.239152
min    6.660209e+17            0.000000            0.000000       1.000000
25%    6.782670e+17           10.000000           10.000000     536.000000
50%    7.182469e+17           11.000000           10.000000    1236.000000
75%    7.986692e+17           12.000000           10.000000    3067.000000
max    8.924206e+17           13.000000           20.000000   75918.000000


       favorite_count
count     2331.000000
mean      7423.742600
std      11527.811718
min          0.000000
25%       1291.000000
50%       3223.000000
75%       9081.500000
max     153240.000000
```

[54]: `tweet_df_merge.tweet_id .duplicated`

[54]: <bound method Series.duplicated of 0   892420643555336193
```
1         892177421306343426
2         891815181378084864
3         891689557279858688
4         891327558926688256
                 …
2326      666049248165822465
2327      666044226329800704
2328      666033412701032449
2329      666029285002620928
2330      666020088022790149
```

```
Name: tweet_id, Length: 2331, dtype: int64>
```

[55]:
```
tweet_df_merge.doggo.value_counts()
```

[55]:
```
None     2237
doggo      94
Name: doggo, dtype: int64
```

[56]:
```
tweet_df_merge.floofer.value_counts()
```

[56]:
```
None       2321
floofer      10
Name: floofer, dtype: int64
```

[57]:
```
tweet_df_merge.pupper.value_counts()
```

[57]:
```
None      2076
pupper     255
Name: pupper, dtype: int64
```

[58]:
```
tweet_df_merge.puppo.value_counts()
```

[58]:
```
None     2301
puppo      30
Name: puppo, dtype: int64
```

[59]:
```
cols = ['doggo', 'floofer', 'pupper', 'puppo']
tweet_df_merge['stages_of_dog'] = tweet_df_merge[cols].apply(lambda row: '_'.
 ↪join(row.values.astype(str)), axis=1)
tweet_df_merge.drop(['doggo'], axis=1, inplace=True)
tweet_df_merge.drop(['floofer'], axis=1, inplace=True)
tweet_df_merge.drop(['pupper'], axis=1, inplace=True)
tweet_df_merge.drop(['puppo'], axis=1, inplace=True)

tweet_df_merge.head(2)
```

[59]:
```
            tweet_id                                      source  \
0  892420643555336193  <a href="http://twitter.com/download/iphone" r…
1  892177421306343426  <a href="http://twitter.com/download/iphone" r…

                                                text  \
0  This is Phineas. He's a mystical boy. Only eve…
1  This is Tilly. She's just checking pup on you…

                        expanded_urls  rating_numerator  \
0  https://twitter.com/dog_rates/status/892420643…                13
1  https://twitter.com/dog_rates/status/892177421…                13
```

```
   rating_denominator       name                     timestamp  retweet_count  \
0                     10  Phineas  Tue Aug 01 16:23:56 +0000 2017           7510
1                     10   Tilly   Tue Aug 01 00:17:27 +0000 2017           5574

   favorite_count display_text_range        stages_of_dog
0           35521            [0, 85]  None_None_None_None
1           30744           [0, 138]  None_None_None_None
```

[60]: `tweet_df_merge.stages_of_dog.value_counts()`

```
[60]: None_None_None_None      1956
      None_None_pupper_None     243
      doggo_None_None_None       80
      None_None_None_puppo       29
      doggo_None_pupper_None     12
      None_floofer_None_None      9
      doggo_None_None_puppo       1
      doggo_floofer_None_None     1
      Name: stages_of_dog, dtype: int64
```

[61]:
```python
#raplace None_None_None_None with stages_of_dog "None"
tweet_df_mergev2=tweet_df_merge.copy()
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'None_None_None_None', 'stages_of_dog'] = "None"
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'doggo_None_None_None', 'stages_of_dog'] = 'doggo'
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'None_None_pupper_None', 'stages_of_dog'] = 'pupper'
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'doggo_None_pupper_None', 'stages_of_dog'] = 'pupper' #choose the oldest
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'None_None_None_puppo', 'stages_of_dog'] = 'puppo'
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'doggo_None_None_puppo', 'stages_of_dog'] = 'puppo'
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'None_floofer_None_None', 'stages_of_dog'] = 'floofer'
tweet_df_mergev2.loc[tweet_df_mergev2['stages_of_dog'] ==
 ↪'doggo_floofer_None_None', 'stages_of_dog'] = 'floofer'

tweet_df_mergev2.stages_of_dog.value_counts()
```

```
[61]: None       1956
      pupper      255
      doggo        80
      puppo        30
      floofer      10
      Name: stages_of_dog, dtype: int64
```

```
[62]: tweet_df_mergev2.isnull().sum()
```

```
[62]: tweet_id              0
      source                0
      text                  0
      expanded_urls        59
      rating_numerator      0
      rating_denominator    0
      name                  0
      timestamp             0
      retweet_count         0
      favorite_count        0
      display_text_range    0
      stages_of_dog         0
      dtype: int64
```

```
[63]: #Popularity_of_dog
      Popularity_of_dog=pivot = pd.pivot_table(tweet_df_mergev2,␣
       ↪values=('retweet_count','favorite_count'), index=['stages_of_dog'],␣
       ↪aggfunc=np.count_nonzero)
      Popularity_of_dog
```

```
[63]:                favorite_count   retweet_count
      stages_of_dog
      None                     1825            1956
      doggo                      74              80
      floofer                    10              10
      pupper                    234             255
      puppo                      25              30
```

```
[64]: #Popularity_of_dog to csv
      Popularity_of_dog.to_csv('Popularity_of_dog.csv',index=True)
      Popularity_of_dog_df=pd.read_csv('Popularity_of_dog.csv')
      Popularity_of_dog_df
```

```
[64]:   stages_of_dog  favorite_count  retweet_count
      0          None            1825           1956
      1         doggo              74             80
      2       floofer              10             10
      3        pupper             234            255
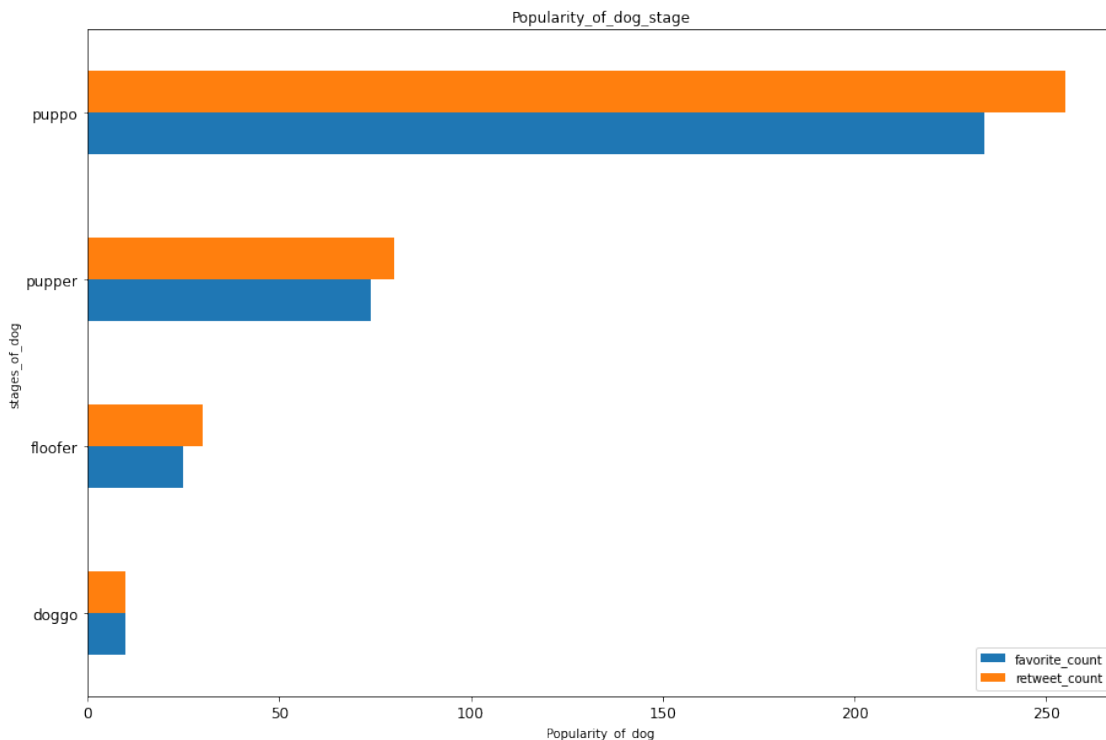      4         puppo              25             30
```

```
[65]: # clean and arenge
      Popularity_of_dog_df.drop(Popularity_of_dog_df.
       ↪loc[Popularity_of_dog_df['stages_of_dog']=='None'].index , inplace=True)
      df=Popularity_of_dog_df.sort_values(['favorite_count', 'retweet_count'],␣
       ↪ascending=[True, False])
```

```python
df.reset_index(drop=True, inplace=True)
index= ['doggo', 'floofer', 'pupper', 'puppo']
df.index=index
df.index
```

[65]: Index(['doggo', 'floofer', 'pupper', 'puppo'], dtype='object')

[66]:
```python
ax=df.plot(kind='barh', figsize=(15,10), legend=True, fontsize=12)
ax.set_ylabel("stages_of_dog")
ax.set_xlabel("Popularity_of_dog")

plt.IndexLocator
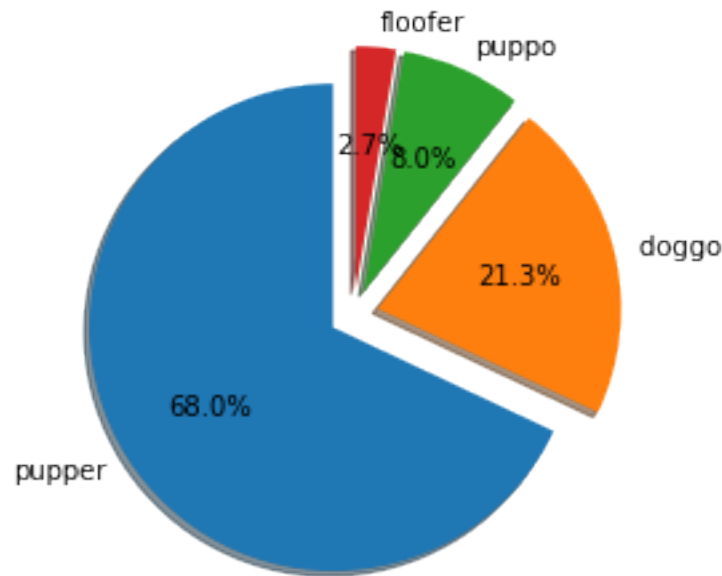plt.title(("Popularity_of_dog_stage"))
plt.savefig('Popularity_of_dog.png')
```


[67]:
```python
# Pie chart for dog_stages, where the slices will be ordered and plotted␣
↪counter-clockwise:
labels = 'pupper', 'doggo ', 'puppo', 'floofer'
sizes = [255, 80, 30, 10]
names=('stages_of_dog')
explode = (0.1, 0.1, 0.1, 0.1)  # only "explode" the 2nd slice (i.e. 'Hogs')

fig1, ax1 = plt.subplots()
```

```
ax1.pie(sizes, explode=explode, labels=labels, autopct='%1.1f%%',
        shadow=True, startangle=90)
ax1.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a circle.

plt.savefig('dog_stages')
```


[68]:
```
#Popularity of user retweet
tweet_df_mergev2.sort_values(['tweet_id', 'retweet_count'], ascending=[True,␣
↪False])

tweet_df_mergev2.head(3)
```

[68]:
```
            tweet_id                                             source  \
0  892420643555336193  <a href="http://twitter.com/download/iphone" r…
1  892177421306343426  <a href="http://twitter.com/download/iphone" r…
2  891815181378084864  <a href="http://twitter.com/download/iphone" r…

                                                text  \
0  This is Phineas. He's a mystical boy. Only eve…
1  This is Tilly. She's just checking pup on you…
2  This is Archie. He is a rare Norwegian Pouncin…

                          expanded_urls  rating_numerator  \
0  https://twitter.com/dog_rates/status/892420643…                13
1  https://twitter.com/dog_rates/status/892177421…                13
2  https://twitter.com/dog_rates/status/891815181…                12
```

```
    rating_denominator     name                              timestamp  retweet_count  \
0                   10  Phineas  Tue Aug 01 16:23:56 +0000 2017           7510
1                   10    Tilly  Tue Aug 01 00:17:27 +0000 2017           5574
2                   10   Archie  Mon Jul 31 00:18:03 +0000 2017           3690

   favorite_count display_text_range stages_of_dog
0           35521            [0, 85]          None
1           30744           [0, 138]          None
2           23113           [0, 121]          None
```

[69]:
```python
# marge tweet_df_merge and image_df_clean
tweet_df_main = pd.merge(tweet_df_mergev2, image_df_clean ,on='tweet_id')
tweet_df_main.set_index('tweet_id')
tweet_df_main.columns
```

[69]:
```
Index(['tweet_id', 'source', 'text', 'expanded_urls', 'rating_numerator',
       'rating_denominator', 'name', 'timestamp', 'retweet_count',
       'favorite_count', 'display_text_range', 'stages_of_dog', 'jpg_url',
       'img_num', 'p1', 'p1_conf', 'p1_dog', 'p2', 'p2_conf', 'p2_dog', 'p3',
       'p3_conf', 'p3_dog'],
      dtype='object')
```

[70]:
```python
tweet_df_main.shape   # deling with one database
```

[70]:
```
(2059, 23)
```

[71]:
```python
tweet_df_main.source.value_counts()
```

[71]:
```
<a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
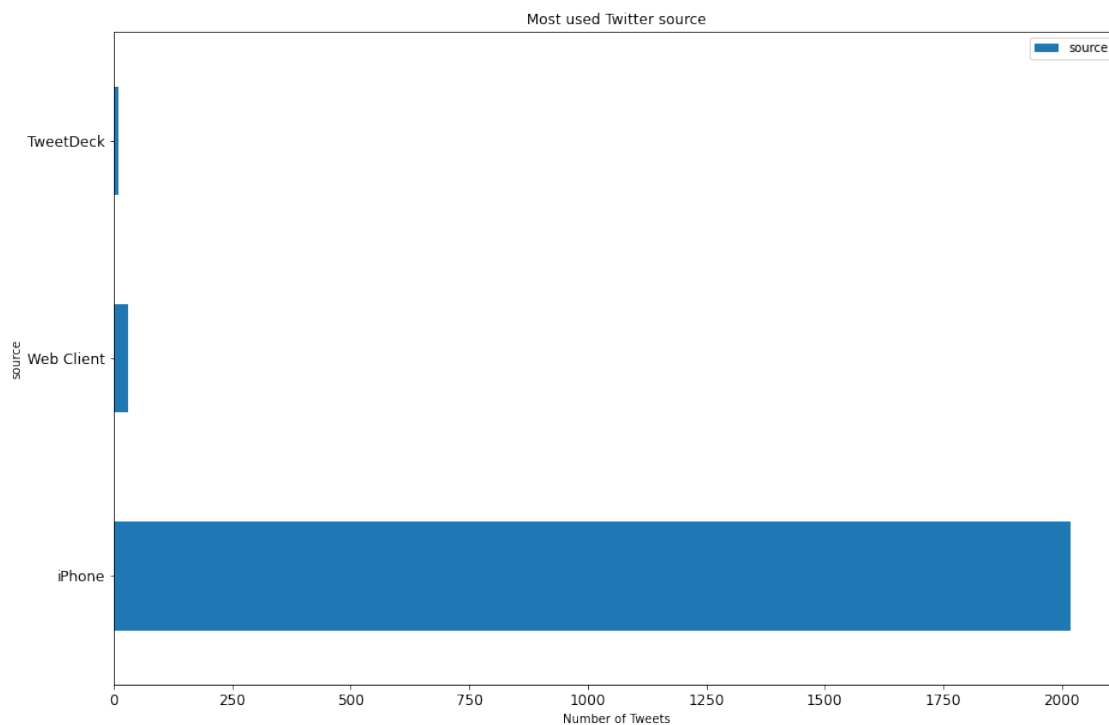iPhone</a>        2019
<a href="http://twitter.com" rel="nofollow">Twitter Web Client</a>
30
<a href="https://about.twitter.com/products/tweetdeck"
rel="nofollow">TweetDeck</a>        10
Name: source, dtype: int64
```

[72]:
```python
#raplace url source by the main source "
tweet_df_mainv2=tweet_df_main.copy()
tweet_df_mainv2.loc[tweet_df_mainv2['source'] == '<a href="http://twitter.com/
 ↪download/iphone" rel="nofollow">Twitter for iPhone</a>', 'source'] = 'iPhone'
tweet_df_mainv2.loc[tweet_df_mainv2['source'] == '<a href="http://twitter.com"␣
 ↪rel="nofollow">Twitter Web Client</a>', 'source'] = 'Web Client'
tweet_df_mainv2.loc[tweet_df_mainv2['source'] == '<a href="https://about.
 ↪twitter.com/products/tweetdeck" rel="nofollow">TweetDeck</a>', 'source'] =␣
 ↪'TweetDeck'
tweet_df_mainv2.source.value_counts()
```

```
[72]: iPhone        2019
      Web Client      30
      TweetDeck       10
      Name: source, dtype: int64
```

```
[73]: # plot Most used Twitter source
      Twitter_source=tweet_df_mainv2['source'].value_counts().plot(kind='barh',␣
       ↪figsize=(15,10), legend=True, fontsize=12)
      Twitter_source.set_ylabel("source")
      Twitter_source.set_xlabel("Number of Tweets")
      plt.title(("Most used Twitter source"))
      plt.savefig('Twitter_source.png')
```



```
[74]: # save new datasets
      tweet_df_mainv2.to_csv('main_df.csv', index=False)
      main_df=pd.read_csv('main_df.csv')
      main_df.columns
```

```
[74]: Index(['tweet_id', 'source', 'text', 'expanded_urls', 'rating_numerator',
             'rating_denominator', 'name', 'timestamp', 'retweet_count',
             'favorite_count', 'display_text_range', 'stages_of_dog', 'jpg_url',
             'img_num', 'p1', 'p1_conf', 'p1_dog', 'p2', 'p2_conf', 'p2_dog', 'p3',
             'p3_conf', 'p3_dog'],
            dtype='object')
```

3.2 Resource

Tweepy Documentation http://docs.tweepy.org/en/latest/index.html

Select & Replace Values in Column based on Condition
https://datatofish.com/select-rows-pandas-dataframe/ https://pythonexamples.org/pandas-dataframe-replace-values-in-column-based-on-condition/ https://www.codegrepper.com/code-examples/python/pandas+replace+values+in+column+based+on+condition
https://thispointer.com/python-pandas-select-rows-in-dataframe-by-conditions-on-multiple-columns/

concatenate multiple column https://stackoverflow.com/questions/392 91499/how-to-concatenate-multiple-column-values-into-a-single-column-in-panda-datafram

Convert Text file to JSON in Python https://www.geeksforgeeks.org/convert-text-file-to-json-in-python/ https://www.marsja.se/how-to-read-and-write-json-files-using-python-and-pandas/ https://amitshankar.github.io/analyzing-twitter-feed-part-1-wrangling-code.htm https://github.com/vprusso/youtube_tutorials/tree/master/twitter_python
https://github.com/gouravaich/wrangle-analyze-weratedogs-twitter

How to Convert Jupyter Notebooks into PDFs https://towardsdatascience.com/how-to-convert-jupyter-notebooks-into-pdf-5accaef3758 https://nbconvert.readthedocs.io/en/latest/ https://pandoc.org/getting-started.html https://github.com/pyppeteer/pyppeteer https://www.latex-project.org/

How to Save a Plot to a File Using Matplotlib
https://chartio.com/resources/tutorials/how-to-save-a-plot-to-a-file-using-matplotlib/

Past project https://github.com/abdelrazekrizk/IBM-Data-Science-by-IBM-on-Coursera-Capstone/blob/master/Capstone%20Project/Business%20Consulting%20Making%20Decisions.ipynb

4 Fun_Out_Project

4.1 My_Signature

```python
[66]: api=tweepy.API(auth) # 30 Days of Python - Day 21 - Twitter API with Tweepy ⌐
      ↪Python TUTORIAL
```

```python
[67]: me=api.me()
```

```python
[68]: # get to know my followers
      print(me.screen_name)
      for friend in me.friends():
          print(friend.screen_name)
```

```
RizkAbdelrazek
HL7
MS_ITProCA
```

```
TwitterDev
dog_rates
VisualStudio
windowsdev
amyklobuchar
crpietschmann
MSVirtAcademy
stevenborg
FirelyTeam
IntelHealth
IBMWatsonHealth
Health_IT
Build5Nines
AzureSQL
SenRonJohnson
AzureDataStudio
eltaeboficial
chadwickboseman
```

```python
[69]: print("followers_count :",me.followers_count)
      print("Signature")

      print (me.screen_name)
```

```
followers_count : 52
Signature
RizkAbdelrazek
```