Project 2

October 2, 2022

0.1 INTRODUCTION

- Below is the twitter archive dataset for @dog_rates, which is also known as WeRateDogs. This dataset will be wrangled,analyzed and visualized. WeRateDogs is where dogs are rated with different types of feedback. There are over 5000+ of their tweets. The text column was used to extract dog names, ratings and dog stages. The tweets have been filtered for tweets with ratings only. In the WeRateDogs twitter archive, images were run throgh neural network, in this dataset, we will be gathering Retweet counts and Favorite counts.

0.2 Table Of Content

- Gathering Data • Assessing Data • Cleaning Data • Storing Data • Data Analysis and visualization

[172]:

```
import pandas as pd
import numpy as np
import requests
import matplotlib.pyplot as plt
%matplotlib inline
```

[205]:

```
#importing Enhanced Twitter Archive
df = pd.read_csv('twitter-archive-enhanced-2.csv')
```

[206]:

```
tsv_data = pd.read_csv('image-predictions-3.tsv', sep='\t')
```

[207]:

```
# Downloading Twitter image predictions
url = "https://video.udacity-data.com/topher/2018/November/
 ↪5bf60c69_image-predictions-3/image-predictions-3.tsv"
response = requests.get(url)

with open('image-predictions.tsv', mode ='wb') as file:
    file.write(response.content)
```

[208]:

```
# importing required libraries
import tweepy
from tweepy import OAuthHandler
import json
from timeit import default_timer as timer
```

```
# Getting tweet data from Twitter API
consumer_key = 'HIDDEN'
consumer_secret = 'HIDDEN'
access_token = 'HIDDEN'
access_secret = 'HIDDEN'

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

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

tweet_ids = df.tweet_id.values
len(tweet_ids)
```

[208]: 2356

[209]:

```
# converting the txt file to data lisr where each element (line) contains one␣
 ↪piece of twitter info
df_list = []

with open('tweet-json.txt') as file:
    for line in file:
        df_list.append(json.loads(line))
```

[210]:

```
print(df_list[0])
```

```
{'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': {'large': {'w': 540, 'h': 528, 'resize': 'fit'}, 'thumb':
{'w': 150, 'h': 150, 'resize': 'crop'}, 'small': {'w': 540, 'h': 528, 'resize':
'fit'}, 'medium': {'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': {'large': {'w': 540, 'h': 528, 'resize': 'fit'}, 'thumb':
{'w': 150, 'h': 150, 'resize': 'crop'}, 'small': {'w': 540, 'h': 528, 'resize':
'fit'}, 'medium': {'w': 540, 'h': 528, 'resize': 'fit'}}}]}, 'source': '<a
href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
iPhone</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': 4196983835, 'id_str':
'4196983835', 'name': 'WeRateDogs (author)', 'screen_name': 'dog_rates',
'location': 'DM YOUR DOGS, WE WILL RATE', 'description': '#1 Source for
Professional Dog Ratings | STORE: @ShopWeRateDogs | IG, FB & SC: WeRateDogs
MOBILE APP: @GoodDogsGame | Business: dogratingtwitter@gmail.com', 'url':
'https://t.co/N7sNNHAEXS', 'entities': {'url': {'urls': [{'url':
'https://t.co/N7sNNHAEXS', 'expanded_url': 'http://weratedogs.com',
'display_url': 'weratedogs.com', 'indices': [0, 23]}]}, 'description': {'urls':
[]}}, 'protected': False, 'followers_count': 3200889, 'friends_count': 104,
'listed_count': 2784, 'created_at': 'Sun Nov 15 21:41:29 +0000 2015',
'favourites_count': 114031, 'utc_offset': None, 'time_zone': None,
'geo_enabled': True, 'verified': True, 'statuses_count': 5288, 'lang': 'en',
'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/861415328504569856/R2xOOfwe_normal.jpg',
'profile_image_url_https':
'https://pbs.twimg.com/profile_images/861415328504569856/R2xOOfwe_normal.jpg',
'profile_banner_url':
'https://pbs.twimg.com/profile_banners/4196983835/1501129017',
'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': True,
'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': 8853, 'favorite_count': 39467,
'favorited': False, 'retweeted': False, 'possibly_sensitive': False,
'possibly_sensitive_appealable': False, 'lang': 'en'}
```

[212]:
```
# Dataframe from previous list that contains id, retweet count and favorite␣
 ↪count is created below
tweet_data = pd.DataFrame(df_list, columns = ['id',
                                              'retweet_count',
                                              'favorite_count'])
```

[213]:
```
tweet_data.head()
```

[213]:

```
                   id  retweet_count  favorite_count
0  892420643555336193           8853           39467
1  892177421306343426           6514           33819
2  891815181378084864           4328           25461
3  891689557279858688           8964           42908
4  891327558926688256           9774           41048
```

[214]:

```
# The name of the id column is changed to tweet_id
tweet_data = tweet_data.rename(columns = {'id':'tweet_id'})
tweet_data.head()
```

[214]:

```
             tweet_id  retweet_count  favorite_count
0  892420643555336193           8853           39467
1  892177421306343426           6514           33819
2  891815181378084864           4328           25461
3  891689557279858688           8964           42908
4  891327558926688256           9774           41048
```

[187]:

```
# The dataframe file is saved as csv for future use
tweet_data.to_csv('tweet_data.csv', index=False)
```

[215]:

```
# This is to check is the file was saved correctly
x = pd.read_csv('tweet_data.csv')
x.head()
```

[215]:

```
             tweet_id  retweet_count  favorite_count
0  892420643555336193           8853           39467
1  892177421306343426           6514           33819
2  891815181378084864           4328           25461
3  891689557279858688           8964           42908
4  891327558926688256           9774           41048
```

0.3 Assessing Data

[190]:

```
## Programmaticalliy and visually assessing data for quality and tidiness issues
## programmatic assessment, using code to view specific portions and summaries␣
 ↪of data.
## visual assessment scrolling through the data on your preferred software␣
 ↪application.
## Tidiness: issues that prevent easy analysis. untidity data is also known as␣
 ↪messy data.
## Tidy requirements: Each variable forms a column. Each observation forms a␣
 ↪row. Each type of observational unit forma a table
## Quality: issues with content. low quality data is also known as dity data
```

0.4 Assessing Enhanced Twitter Archive Data

[216]:
```
df = pd.read_csv('twitter-archive-enhanced-2.csv')
```

[217]:
```
df.head()
```

[217]:
```
             tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
0  892420643555336193                    NaN                  NaN
1  892177421306343426                    NaN                  NaN
2  891815181378084864                    NaN                  NaN
3  891689557279858688                    NaN                  NaN
4  891327558926688256                    NaN                  NaN

                   timestamp  \
0  2017-08-01 16:23:56 +0000
1  2017-08-01 00:17:27 +0000
2  2017-07-31 00:18:03 +0000
3  2017-07-30 15:58:51 +0000
4  2017-07-29 16:00:24 +0000

                                              source  \
0  <a href="http://twitter.com/download/iphone" r…
1  <a href="http://twitter.com/download/iphone" r…
2  <a href="http://twitter.com/download/iphone" r…
3  <a href="http://twitter.com/download/iphone" r…
4  <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
2  This is Archie. He is a rare Norwegian Pouncin…                  NaN
3  This is Darla. She commenced a snooze mid meal…                  NaN
4  This is Franklin. He would like you to stop ca…                  NaN

   retweeted_status_user_id retweeted_status_timestamp  \
0                       NaN                        NaN
1                       NaN                        NaN
2                       NaN                        NaN
3                       NaN                        NaN
4                       NaN                        NaN

                                       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
3  https://twitter.com/dog_rates/status/891689557…                13
4  https://twitter.com/dog_rates/status/891327558…                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
3                  10     Darla  None    None   None  None
4                  10  Franklin  None    None   None  None
```

[91]:

```
df.info()
```

```
<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
```

[218]:

```
df.rating_numerator.describe()
```

[218]:

```
count    2356.000000
mean       13.126486
std        45.876648
min         0.000000
25%        10.000000
50%        11.000000
75%        12.000000
max      1776.000000
Name: rating_numerator, dtype: float64
```

[188]:
```python
# Checking which Ids have numerators with less than 10
df[df.rating_numerator <10].tweet_id
```

[188]:
```
45      883482846933004288
229     848212111729840128
315     835152434251116546
387     826598799820865537
462     817502432452313088
                ...
2351    666049248165822465
2352    666044226329800704
2353    666033412701032449
2354    666029285002620928
2355    666020888022790149
Name: tweet_id, Length: 440, dtype: int64
```

[219]:
```python
# Checking rating_numerator of tweet_id
df.loc[(df.tweet_id == 666337882303524864), 'rating_numerator']
```

[219]:
```
2333    9
Name: rating_numerator, dtype: int64
```

[97]:
```python
# Checking text of tweet id using the number of the row
df.loc[2333, 'text']
```

[97]:
```
'This is an extremely rare horned Parthenon. Not amused. Wears shoes. Overall
very nice. 9/10 would pet aggressively https://t.co/QpRjllzWAL'
```

[98]:
```python
df.rating_denominator.describe()
# some denominators have a zero value
```

[98]:
```
count    2356.000000
mean       10.455433
std         6.745237
min         0.000000
25%        10.000000
50%        10.000000
75%        10.000000
max       170.000000
Name: rating_denominator, dtype: float64
```

[100]:
```python
# Checking which IDs have denominators with a zero value
df[df.rating_denominator == 0].tweet_id
```

[100]:
```
313    835246439529840640
Name: tweet_id, dtype: int64
```

[192]:

```
df.loc[313, 'text']
# it looks like someone was trying to correct @jonnysun
```

[192]:

```
"@jonnysun @Lin_Manuel ok jomny I know you're excited but 960/00 isn't a valid
rating, 13/10 is tho"
```

[103]:

```
df[df.rating_denominator != 10].count()[0]
```

[103]:

```
23
```

[104]:

```
df.name.value_counts()
```

[104]:

```
None          745
a              55
Charlie        12
Cooper         11
Lucy           11
             …
Dex             1
Ace             1
Tayzie          1
Grizzie         1
Christoper      1
Name: name, Length: 957, dtype: int64
```

[105]:

```
i_predictions = pd.read_csv('image-predictions.tsv', sep= '\t')
i_predictions.head()
```

[105]:

```
             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

   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

    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
```

[106]:
```
i_predictions.sample(10)
```

[106]:
```
                tweet_id                                            jpg_url  \
1317  755206590534418437    https://pbs.twimg.com/media/CnsITOWWcAAul8V.jpg
1177  737800304142471168    https://pbs.twimg.com/media/Cj0xdMBVAAEbDHp.jpg
1265  749317047558017024  https://pbs.twimg.com/ext_tw_video_thumb/74931…
1815  833826103416520705    https://pbs.twimg.com/media/C5JYaYoVYAAcEQw.jpg
31    666421158376562688    https://pbs.twimg.com/media/CT-aggCXAAIMfT3.jpg
332   672139350159835138    https://pbs.twimg.com/media/CVPrLE2WwAELCxD.jpg
1242  747204161125646336    https://pbs.twimg.com/media/Cl6aOBhWEAALuti.jpg
481   675362609739206656    https://pbs.twimg.com/media/CV9etctWUAAl5Hp.jpg
1780  828650029636317184    https://pbs.twimg.com/media/C3_0yhCWEAETXj2.jpg
239   670435821946826752    https://pbs.twimg.com/media/CU3d0azWUAA38FD.jpg

      img_num                       p1   p1_conf  p1_dog  \
1317        1                 web_site  0.906673   False
1177        1                 malamute  0.374682    True
1265        1  wire-haired_fox_terrier  0.155144    True
1815        1                Chihuahua  0.438054    True
31          1          Blenheim_spaniel  0.906777    True
332         1               Rottweiler  0.290992    True
1242        2                     coil  0.533699   False
481         1       Labrador_retriever  0.479008    True
1780        1         golden_retriever  0.649209    True
239         1                   sorrel  0.460370   False

                           p2   p2_conf  p2_dog           p3   p3_conf  \
1317                  printer  0.008600   False       carton  0.004533
1177        Norwegian_elkhound  0.334853    True    limousine  0.068173
1265          Lakeland_terrier  0.108382    True      buckeye  0.074617
1815                    kelpie  0.149706    True     Pembroke  0.096480
31               cocker_spaniel  0.090346    True     Shih-Tzu  0.001117
332         American_black_bear  0.238120   False   chimpanzee  0.115541
1242                    dugong  0.087959   False  rain_barrel  0.039221
481                   ice_bear  0.218289   False       kuvasz  0.139911
1780  Chesapeake_Bay_retriever  0.198560    True       vizsla  0.056200
239                    basenji  0.135767    True     Cardigan  0.099174

      p3_dog
1317   False
1177   False
1265   False
1815    True
31      True
332    False
```

```
1242    False
481      True
1780     True
239      True
```

[193]:

```
# Curiosity lies in how a tub was identified
i_predictions.loc[1312, 'jpg_url']
```

[193]:

```
'https://pbs.twimg.com/ext_tw_video_thumb/754481405627957248/pu/img/YY1eBDOlP9QF
C4Bj.jpg'
```

[112]:

```
import pandas as pd
```

[194]:

```
from IPython.display import Image
Image (url = 'https://pbs.twimg.com/ext_tw_video_thumb/754481405627957248/pu/
 ↪img/YY1eBDOlP9QFC4Bj.jpg')
# Now it's clear how the tub was identified.
```

[194]:

```
<IPython.core.display.Image object>
```

[121]:

```
i_predictions.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
```

[122]:

```
tweet_data.head()
```

[122]:

```
             tweet_id  retweet_count  favorite_count
0  892420643555336193           8853           39467
1  892177421306343426           6514           33819
```

```
2  891815181378084864          4328          25461
3  891689557279858688          8964          42908
4  891327558926688256          9774          41048
```

0.5 Assessing Tweet Data from Twitter API

[123]:
```
tweet_data.sample(10)
```

[123]:
```
                tweet_id  retweet_count  favorite_count
819   770293558247038976           1718            6923
1809  676819651066732545            741            1957
1186  718454725339934721           1685            5320
2084  670803562457407488             95             362
1011  747219827526344708           1791            5792
1071  739932936087216128           1217            4443
1391  700029284593901568            661            2262
315   834931633769889797           1878           11838
1298  707693576495472641           1133            3765
2314  666649482315059201            608             923
```

0.6 Twitter Enhanced Data

• Dog names are not valid(a, NAN, an, instead of a name) • invalid tweet_id data type (integer instead of string) • row 313 has a 0 denominator • invalid timestamp data (string not datetime) • There are 181 retweets as indicated by retweeted_status_id • 440 rating numerators less than 10 (ex:1998)

0.7 Tweet Image Predictions

• Underscores are used in multi-word names names in columns p1,p2,p3 instead of spaces. • Some P names start with uppercase letter while others start lowercase. • Missing photos for some IDs (2075 rows instead of 2356.

0.8 Tweet Data From Twitter API

- Missing entries (only 2354 entries instead of 2356)

0.9 Cleaning Data

0.10 Creating Dataframe copies

[220]:
```
clean_df = df.copy()
clean_i_predictions = i_predictions.copy()
clean_tweet_data = tweet_data.copy()
```

[126]:
```
clean_df.head(1)
```

[126]:

```
             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
```

[127]:

```
clean_i_predictions.head(1)
```

[127]:

```
             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
```

[128]:

```
clean_tweet_data.head(1)
```

[128]:

```
             tweet_id  retweet_count  favorite_count
0  892420643555336193           8853           39467
```

0.11 Dog stage is separated into 4 columns

Define • Merge the four columns

Code

[129]:

```
## Dog rate stage is extracted from text column into the new dog_stage cokumn
clean_df['dog_stage'] = clean_df['text'].str.
 ↪extract('(doggo|floofer|pupper|puppo)')
clean_df.head()
```

[129]:

```
             tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
0  892420643555336193                    NaN                  NaN
1  892177421306343426                    NaN                  NaN
2  891815181378084864                    NaN                  NaN
3  891689557279858688                    NaN                  NaN
4  891327558926688256                    NaN                  NaN

                   timestamp  \
0  2017-08-01 16:23:56 +0000
1  2017-08-01 00:17:27 +0000
2  2017-07-31 00:18:03 +0000
3  2017-07-30 15:58:51 +0000
4  2017-07-29 16:00:24 +0000

                                                source  \
0  <a href="http://twitter.com/download/iphone" r…
1  <a href="http://twitter.com/download/iphone" r…
2  <a href="http://twitter.com/download/iphone" r…
3  <a href="http://twitter.com/download/iphone" r…
4  <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
2  This is Archie. He is a rare Norwegian Pouncin…                   NaN
3  This is Darla. She commenced a snooze mid meal…                   NaN
4  This is Franklin. He would like you to stop ca…                   NaN

   retweeted_status_user_id retweeted_status_timestamp  \
0                       NaN                        NaN
1                       NaN                        NaN
2                       NaN                        NaN
3                       NaN                        NaN
4                       NaN                        NaN

                                         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
3  https://twitter.com/dog_rates/status/891689557…                13
4  https://twitter.com/dog_rates/status/891327558…                12

   rating_denominator      name doggo floofer pupper puppo dog_stage
0                  10   Phineas  None    None   None  None       NaN
1                  10     Tilly  None    None   None  None       NaN
2                  10    Archie  None    None   None  None       NaN
3                  10     Darla  None    None   None  None       NaN
```

```
4                    10  Franklin  None     None    None  None        NaN
```

[221]:

```
## Drop unrequired columns
clean_df = clean_df.drop(columns=['doggo', 'floofer', 'pupper', 'puppo'])
```

Test

[132]:

```
clean_df.dog_stage.value_counts()
```

[132]:

```
pupper     265
doggo       93
puppo       37
floofer      4
Name: dog_stage, dtype: int64
```

Test2 All data is related but divided into 3 separate datasets

Define Merge all Datasets into 1 based on tweet_id

Code

[133]:

```
## Merging Twitter enhanced data by cleaning it with tweet data from twitter Api
clean_df = pd.merge(clean_df, clean_tweet_data, on='tweet_id', how='left')
## Merging the resulting merged archive with the tweet image predictions
clean_df = pd.merge(clean_df, clean_i_predictions, on='tweet_id', how='left')
```

Test

[134]:

```
clean_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2356 entries, 0 to 2355
Data columns (total 27 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  dog_stage                   399 non-null    object
 14  retweet_count               2354 non-null   float64
 15  favorite_count              2354 non-null   float64
 16  jpg_url                     2075 non-null   object
 17  img_num                     2075 non-null   float64
 18  p1                          2075 non-null   object
 19  p1_conf                     2075 non-null   float64
 20  p1_dog                      2075 non-null   object
 21  p2                          2075 non-null   object
 22  p2_conf                     2075 non-null   float64
 23  p2_dog                      2075 non-null   object
 24  p3                          2075 non-null   object
 25  p3_conf                     2075 non-null   float64
 26  p3_dog                      2075 non-null   object
dtypes: float64(10), int64(3), object(14)
memory usage: 515.4+ KB
```

0.12 Cleaning Quality Issues

- Some of the data will not be cleaned since some of the data will not be used for analysis.

There are 181 retweets as indicated by retweeted_status_id

Define Delete rows that represent retweets and all related columns

Code

[137]:
```
## Keep only original tweets that have no retweet status id
clean_df = clean_df[clean_df.retweeted_status_id.isnull()]
clean_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 27 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   tweet_id                    2175 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                   2175 non-null   object
 4   source                      2175 non-null   object
 5   text                        2175 non-null   object
 6   retweeted_status_id         0 non-null      float64
 7   retweeted_status_user_id    0 non-null      float64
 8   retweeted_status_timestamp  0 non-null      object
 9   expanded_urls               2117 non-null   object
 10  rating_numerator            2175 non-null   int64
 11  rating_denominator          2175 non-null   int64
 12  name                        2175 non-null   object
 13  dog_stage                   364 non-null    object
 14  retweet_count               2175 non-null   float64
 15  favorite_count              2175 non-null   float64
 16  jpg_url                     1994 non-null   object
 17  img_num                     1994 non-null   float64
 18  p1                          1994 non-null   object
 19  p1_conf                     1994 non-null   float64
 20  p1_dog                      1994 non-null   object
 21  p2                          1994 non-null   object
 22  p2_conf                     1994 non-null   float64
 23  p2_dog                      1994 non-null   object
 24  p3                          1994 non-null   object
 25  p3_conf                     1994 non-null   float64
 26  p3_dog                      1994 non-null   object
dtypes: float64(10), int64(3), object(14)
memory usage: 475.8+ KB
```

[229]:

```
## Deleted related columns
clean_df = columns=('retweeted_status_id', 'retweeted_status_user_id',␣
 ↪'retweeted_status_timestamp')
```

[139]:

```
clean_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 24 columns):
 #   Column                 Non-Null Count  Dtype
---  ------                 --------------  -----
 0   tweet_id               2175 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              2175 non-null   object
 4   source                 2175 non-null   object
 5   text                   2175 non-null   object
 6   expanded_urls          2117 non-null   object
 7   rating_numerator       2175 non-null   int64
 8   rating_denominator     2175 non-null   int64
 9   name                   2175 non-null   object
 10  dog_stage              364 non-null    object
 11  retweet_count          2175 non-null   float64
 12  favorite_count         2175 non-null   float64
 13  jpg_url                1994 non-null   object
 14  img_num                1994 non-null   float64
 15  p1                     1994 non-null   object
 16  p1_conf                1994 non-null   float64
 17  p1_dog                 1994 non-null   object
 18  p2                     1994 non-null   object
 19  p2_conf                1994 non-null   float64
 20  p2_dog                 1994 non-null   object
 21  p3                     1994 non-null   object
 22  p3_conf                1994 non-null   float64
 23  p3_dog                  1994 non-null   object
dtypes: float64(8), int64(3), object(13)
memory usage: 424.8+ KB
```

Some dog names are invalid (None, a, an, and the instead of a name)

Define Convert invalid names (None or starting with lower case letters)to NaN and extract the correct names from the text column (after the word “named”)

code

[141]:

```
clean_df.name = clean_df.name.replace(regex=['^[a-z]+','None'], value= np.nan)
## Checking number of null values in name column after conversion
sum(clean_df.name.isnull())
```

[141]:

```
784
```

[201]:

```
# A function needs to be declared to extract names from the text column, and␣
 ↪return NaN if there is no named word
def function(text):
    txt_list = text.split()
    for word in txt_list:
        if word.lower() == 'named':
            name_index = txt_list.index(word)
            return txt_list[name_index]
        else:
            pass
        return np.nan
```

[144]:

```
clean_df.name = np.where(clean_df.name.isnull(), clean_df.text.apply(function),␣
 ↪clean_df.name)
```

Test

[145]:

```
sum(clean_df.name.isnull())
## Names were added in place of some null vales
```

[145]:

```
784
```

invalid tweet_id data type (integer instead of string)

Define

Correct data that is invalid type bt converting tweet_id to string

Code

[146]:

```
## Tweet_ID is converted to string since no operation will be performed on its␣
 ↪values
clean_df.tweet_id = clean_df.tweet_id.astype(str)
```

Test

[147]:

```
clean_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2175 entries, 0 to 2355
Data columns (total 24 columns):
 #   Column                 Non-Null Count  Dtype
---  ------                 --------------  -----
 0   tweet_id               2175 non-null   object
 1   in_reply_to_status_id  78 non-null     float64
 2   in_reply_to_user_id    78 non-null     float64
 3   timestamp              2175 non-null   object
 4   source                 2175 non-null   object
 5   text                   2175 non-null   object
 6   expanded_urls          2117 non-null   object
 7   rating_numerator       2175 non-null   int64
 8   rating_denominator     2175 non-null   int64
 9   name                   1391 non-null   object
 10  dog_stage              364 non-null    object
 11  retweet_count          2175 non-null   float64
 12  favorite_count         2175 non-null   float64
 13  jpg_url                1994 non-null   object
 14  img_num                1994 non-null   float64
 15  p1                     1994 non-null   object
 16  p1_conf                1994 non-null   float64
 17  p1_dog                 1994 non-null   object
 18  p2                     1994 non-null   object
 19  p2_conf                1994 non-null   float64
 20  p2_dog                 1994 non-null   object
 21  p3                     1994 non-null   object
 22  p3_conf                1994 non-null   float64
 23  p3_dog                 1994 non-null   object
dtypes: float64(8), int64(2), object(14)
memory usage: 424.8+ KB
```

Missing photos for some IDs (2075 rows insteadof 2356)

Define

Delete rows with missing photos

Code

[148]:

```
clean_df = clean_df[clean_df.jpg_url.notnull()]
```

Test

[149]:

```
clean_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1994 entries, 0 to 2355
```

```
Data columns (total 24 columns):
 #   Column                 Non-Null Count  Dtype
---  ------                 --------------  -----
 0   tweet_id               1994 non-null   object
 1   in_reply_to_status_id  23 non-null     float64
 2   in_reply_to_user_id    23 non-null     float64
 3   timestamp              1994 non-null   object
 4   source                 1994 non-null   object
 5   text                   1994 non-null   object
 6   expanded_urls          1994 non-null   object
 7   rating_numerator       1994 non-null   int64
 8   rating_denominator     1994 non-null   int64
 9   name                   1350 non-null   object
 10  dog_stage              326 non-null    object
 11  retweet_count          1994 non-null   float64
 12  favorite_count         1994 non-null   float64
 13  jpg_url                1994 non-null   object
 14  img_num                1994 non-null   float64
 15  p1                     1994 non-null   object
 16  p1_conf                1994 non-null   float64
 17  p1_dog                 1994 non-null   object
 18  p2                     1994 non-null   object
 19  p2_conf                1994 non-null   float64
 20  p2_dog                 1994 non-null   object
 21  p3                     1994 non-null   object
 22  p3_conf                1994 non-null   float64
 23  p3_dog                 1994 non-null   object
dtypes: float64(8), int64(2), object(14)
memory usage: 389.5+ KB
```

Code

[150]:

```
clean_df.p1 = clean_df.p1.str.replace('_', ' ')
clean_df.p2 = clean_df.p2.str.replace('_', ' ')
clean_df.p3 = clean_df.p3.str.replace('_', ' ')
```

Test

[154]:

```
clean_df.p1.head(20)
```

[154]:

```
0                      orange
1                   Chihuahua
2                   Chihuahua
3                 paper towel
4                      basset
5    Chesapeake Bay retriever
6                 Appenzeller
7                  Pomeranian
8               Irish terrier
```

```
9                     Pembroke
10                     Samoyed
11              French bulldog
12                    Pembroke
13              French bulldog
14            golden retriever
15                     whippet
16            golden retriever
17            golden retriever
18              Siberian husky
20              French bulldog
Name: p1, dtype: object
```

```
[156]: clean_df.p2.head(20)
```

```
[156]: 0                  bagel
       1               Pekinese
       2               malamute
       3     Labrador retriever
       4       English springer
       5          Irish terrier
       6          Border collie
       7             Eskimo dog
       8           Irish setter
       9               Cardigan
       10            Pomeranian
       11    Labrador retriever
       12              Cardigan
       13                 boxer
       14    Labrador retriever
       15                borzoi
       16       Tibetan mastiff
       17    Labrador retriever
       18            Eskimo dog
       20                   pug
       Name: p2, dtype: object
```

```
[155]: clean_df.p3.head(20)
```

```
[155]: 0                           banana
       1                         papillon
       2                           kelpie
       3                          spatula
       4     German short-haired pointer
       5                  Indian elephant
       6                        ice lolly
       7                         Pembroke
```

```
8        Chesapeake Bay retriever
9                       Chihuahua
10                           chow
11                         muzzle
12                        basenji
13      Staffordshire bullterrier
14                        redbone
15                         Saluki
16             Labrador retriever
17                 English setter
18                       malamute
20                   bull mastiff
Name: p3, dtype: object
```

Missing enteries only 2354 entries instead of 2356

Define

Delete rows without retweet_count enteries

Code

Deleted in previous steps while cleaning other issues

[157]:
```
sum(clean_df.retweet_count.isnull())
```

[157]:
```
0
```

0.13 Storing Data

[158]:
```
clean_df.to_csv('twitter_archive_master.csv')
```

0.14 Data Analysis and Visualization

Different dog stages percentages

[160]:
```
stage_df = clean_df.dog_stage.value_counts()
stage_df
```

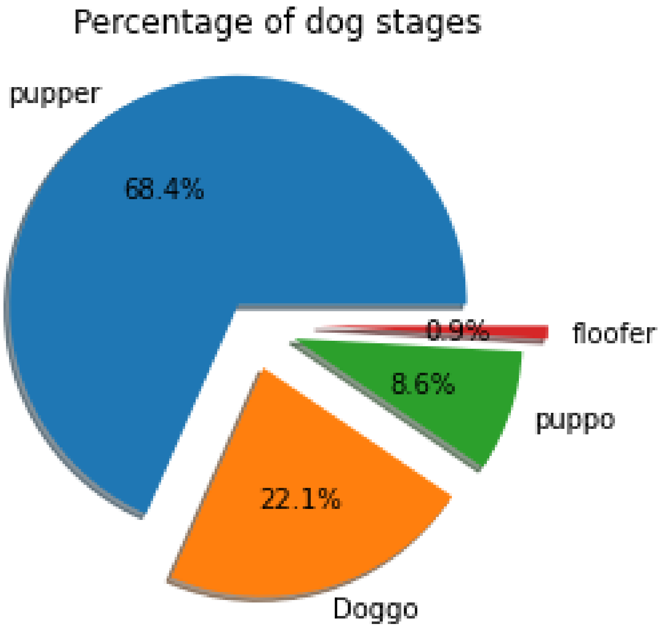
[160]:
```
pupper     223
doggo       72
puppo       28
floofer      3
Name: dog_stage, dtype: int64
```

[164]:
```
import matplotlib.pyplot as plt
```

[170]:
```
plt.pie(stage_df,
        labels = ['pupper', 'Doggo', 'puppo', 'floofer'],
        autopct = '%1.1f%%',
        shadow=True,
        explode=(0.1, 0.2, 0.2, 0.3)
       )
plt.title('Percentage of dog stages')
plt.axis('equal')
```

[170]:

```
(-1.1843354479570871,
 1.4181703555081837,
 -1.3332815068549735,
 1.2056899407062442)
```



Insights

1. Pupper has the highest percentage
2. Floofer has the lowest percentage

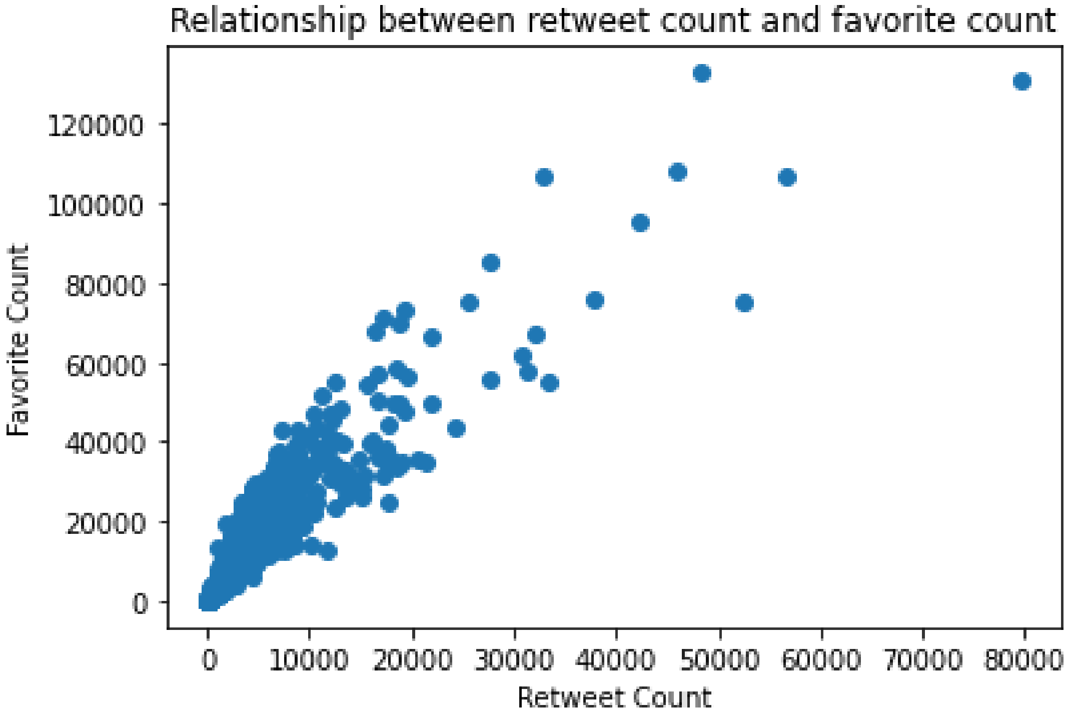
Relationship between retweet count and favorite count

[171]:

```
plt.scatter(clean_df.retweet_count, clean_df.favorite_count)
plt.title('Relationship between retweet count and favorite count')
plt.xlabel('Retweet Count')
plt.ylabel('Favorite Count')
```

[171]:

```
Text(0, 0.5, 'Favorite Count')
```



Insights

It appears that there is a linear relationship between both parameters

1 Wrangle Report

The report that is decribing this data, describes the data wrangling process for this project. The dataset that was wrangled, visualized and analysed was from a twitter dataset archive, WeRateDogs also knonw by their user name on twiiter as @dog_rates. where each dog is rated. WeRatedogs has over 9,3 million followers on twitter.These dog ratings gave denominators and numerators. of which the numerators are always greater than denominators.

The process of wrangling is divided into three steps, which are as follows: 1. Gathering 2. Assessing 3. Cleaning

2 Act Report

The dataset that was wrangled in this project was from the twitter archive data. From the Twitter account WeRateDogs where dogs are rated with comments. The account has over 9,3 million followers. The handle of this account is @dog_rates. where each dog is rated. social media has given this page full recognition, regarding how each dog is rated.