

# wrangle\_act

October 5, 2020

```
In [2]: # import the necessary packages
import tweepy
import pandas as pd
import numpy as np
import requests
import json
import matplotlib.pyplot as plt

% matplotlib inline

from timeit import default_timer as timer

In [3]: # set the option to view all columns within the notebook
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

In [4]: # define the api keys
consumer_key = 'HIDDEN'
consumer_secret = 'HIDDEN'
access_token_key = 'HIDDEN'
access_token_secret = 'HIDDEN'

# initiate the api
auth = tweepy.OAuthHandler(consumer_key, consumer_secret)
auth.set_access_token(access_token_key, access_token_secret)
api = tweepy.API(auth, wait_on_rate_limit = True)

In [5]: # download the tweet image predictions tsv file programmatically
url = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predictions'
response = requests.get(url)
with open('image_predictions.tsv', 'wb') as file:
    file.write(response.content)

In [6]: # read in the archive csv file
archive = pd.read_csv('twitter-archive-enhanced.csv')

In [7]: # Tweet IDs for which to gather additional data via Twitter's API
tweet_ids = archive.tweet_id.values
len(tweet_ids)
```

Out[7]: 2356

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In [10]: # 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)
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Success  
2294: 667152164079423490  
Success  
2295: 667138269671505920  
Success  
2296: 667119796878725120  
Success  
2297: 667090893657276420  
Success  
2298: 667073648344346624  
Success  
2299: 667070482143944705  
Success  
2300: 667065535570550784  
Success  
2301: 667062181243039745  
Success  
2302: 667044094246576128  
Success  
2303: 667012601033924608  
Success  
2304: 666996132027977728  
Success  
2305: 666983947667116034  
Success  
2306: 666837028449972224  
Success  
2307: 666835007768551424  
Success  
2308: 666826780179869698  
Success  
2309: 666817836334096384  
Success  
2310: 666804364988780544  
Success  
2311: 666786068205871104  
Success  
2312: 666781792255496192  
Success  
2313: 666776908487630848  
Success  
2314: 666739327293083650  
Success  
2315: 666701168228331520  
Success  
2316: 666691418707132416

Success  
2317: 666649482315059201  
Success  
2318: 666644823164719104  
Success  
2319: 666454714377183233  
Success  
2320: 666447344410484738  
Success  
2321: 666437273139982337  
Success  
2322: 666435652385423360  
Success  
2323: 666430724426358785  
Success  
2324: 666428276349472768  
Success  
2325: 666421158376562688  
Success  
2326: 666418789513326592  
Success  
2327: 666411507551481857  
Success  
2328: 666407126856765440  
Success  
2329: 666396247373291520  
Success  
2330: 666373753744588802  
Success  
2331: 666362758909284353  
Success  
2332: 666353288456101888  
Success  
2333: 666345417576210432  
Success  
2334: 666337882303524864  
Success  
2335: 666293911632134144  
Success  
2336: 666287406224695296  
Success  
2337: 666273097616637952  
Success  
2338: 666268910803644416  
Success  
2339: 666104133288665088  
Success  
2340: 666102155909144576

```

Success
2341: 666099513787052032
Success
2342: 666094000022159362
Success
2343: 666082916733198337
Success
2344: 666073100786774016
Success
2345: 666071193221509120
Success
2346: 666063827256086533
Success
2347: 666058600524156928
Success
2348: 666057090499244032
Success
2349: 666055525042405380
Success
2350: 666051853826850816
Success
2351: 666050758794694657
Success
2352: 666049248165822465
Success
2353: 666044226329800704
Success
2354: 666033412701032449
Success
2355: 666029285002620928
Success
2356: 666020888022790149
Success
1950.4437940770003
{888202515573088257: TweepError([{'code': 144, 'message': 'No status found with that ID.'}],), 8

```

```

In [152]: # create a dataframe from the resulting json item reading all lines
          tweets_df = pd.read_json('tweet_json.txt', lines = True)

```

```

In [153]: # rename the column 'id' to match the other dataframes
          tweets_df = tweets_df.rename(columns = {'id': 'tweet_id'})

```

```

In [154]: # created a dataframe for the image_predictions tsv file
          images = pd.read_csv('image_predictions.tsv', sep = '\t')

```

```

In [155]: # merged the 'archive' with the 'tweets_df'
          df = pd.merge(archive, tweets_df, on = 'tweet_id', how = 'outer')

```

```
In [156]: # merged the previous result of the merge with 'images' dataframe
df = pd.merge(df, images, on = 'tweet_id', how = 'outer')
```

```
In [157]: # view the columns within the dataframe
df.columns
```

```
Out[157]: Index(['tweet_id', 'in_reply_to_status_id_x', 'in_reply_to_user_id_x',
                'timestamp', 'source_x', 'text', 'retweeted_status_id',
                'retweeted_status_user_id', 'retweeted_status_timestamp',
                'expanded_urls', 'rating_numerator', 'rating_denominator', 'name',
                'doggo', 'floofer', 'pupper', 'puppo', 'contributors', 'coordinates',
                'created_at', 'display_text_range', 'entities', 'extended_entities',
                'favorite_count', 'favorited', 'full_text', 'geo', 'id_str',
                'in_reply_to_screen_name', 'in_reply_to_status_id_y',
                'in_reply_to_status_id_str', 'in_reply_to_user_id_y',
                'in_reply_to_user_id_str', 'is_quote_status', 'lang', 'place',
                'possibly_sensitive', 'possibly_sensitive_appealable', 'quoted_status',
                'quoted_status_id', 'quoted_status_id_str', 'quoted_status_permalink',
                'retweet_count', 'retweeted', 'retweeted_status', 'source_y',
                'truncated', 'user', 'jpg_url', 'img_num', 'p1', 'p1_conf', 'p1_dog',
                'p2', 'p2_conf', 'p2_dog', 'p3', 'p3_conf', 'p3_dog'],
                dtype='object')
```

```
In [158]: # programatically assess the dataframe
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2356 entries, 0 to 2355
Data columns (total 59 columns):
tweet_id                2356 non-null int64
in_reply_to_status_id_x  78 non-null float64
in_reply_to_user_id_x   78 non-null float64
timestamp               2356 non-null object
source_x                2356 non-null object
text                   2356 non-null object
retweeted_status_id      181 non-null float64
retweeted_status_user_id 181 non-null float64
retweeted_status_timestamp 181 non-null object
expanded_urls           2297 non-null object
rating_numerator         2356 non-null int64
rating_denominator       2356 non-null int64
name                    2356 non-null object
doggo                   2356 non-null object
floofer                 2356 non-null object
pupper                  2356 non-null object
puppo                   2356 non-null object
contributors             0 non-null float64
coordinates             0 non-null float64
created_at              2331 non-null datetime64[ns]
```

```

display_text_range      2331 non-null object
entities                2331 non-null object
extended_entities       2059 non-null object
favorite_count          2331 non-null float64
favorited               2331 non-null object
full_text              2331 non-null object
geo                     0 non-null float64
id_str                 2331 non-null float64
in_reply_to_screen_name 77 non-null object
in_reply_to_status_id_y 77 non-null float64
in_reply_to_status_id_str 77 non-null float64
in_reply_to_user_id_y   77 non-null float64
in_reply_to_user_id_str 77 non-null float64
is_quote_status         2331 non-null object
lang                   2331 non-null object
place                  1 non-null object
possibly_sensitive      2197 non-null float64
possibly_sensitive_appealable 2197 non-null float64
quoted_status          24 non-null object
quoted_status_id        26 non-null float64
quoted_status_id_str    26 non-null float64
quoted_status_permalink 26 non-null object
retweet_count           2331 non-null float64
retweeted               2331 non-null object
retweeted_status        163 non-null object
source_y               2331 non-null object
truncated               2331 non-null object
user                   2331 non-null object
jpg_url                2075 non-null object
img_num                2075 non-null float64
p1                     2075 non-null object
p1_conf                2075 non-null float64
p1_dog                 2075 non-null object
p2                     2075 non-null object
p2_conf                2075 non-null float64
p2_dog                 2075 non-null object
p3                     2075 non-null object
p3_conf                2075 non-null float64
p3_dog                 2075 non-null object
dtypes: datetime64[ns](1), float64(22), int64(3), object(33)
memory usage: 1.1+ MB

```

```

In [159]: # manually/visually assess the dataframe
          df.sample(5)

```

```

Out[159]:      tweet_id  in_reply_to_status_id_x  in_reply_to_user_id_x \
          142    864279568663928832                NaN                NaN

```

|      |                    |     |     |
|------|--------------------|-----|-----|
| 735  | 781163403222056960 | NaN | NaN |
| 1451 | 695794761660297217 | NaN | NaN |
| 301  | 836677758902222849 | NaN | NaN |
| 2208 | 668625577880875008 | NaN | NaN |

|      | timestamp \               |
|------|---------------------------|
| 142  | 2017-05-16 00:41:21 +0000 |
| 735  | 2016-09-28 16:07:23 +0000 |
| 1451 | 2016-02-06 02:22:53 +0000 |
| 301  | 2017-02-28 20:41:37 +0000 |
| 2208 | 2015-11-23 03:02:14 +0000 |

|      | source_x \  |
|------|---|
| 142  | <a href="http://twitter.com/download/iphone" r... |
| 735  | <a href="http://twitter.com/download/iphone" r... |
| 1451 | <a href="http://twitter.com/download/iphone" r... |
| 301  | <a href="http://twitter.com/download/iphone" r... |
| 2208 | <a href="http://twitter.com/download/iphone" r... |

|      | text  | retweeted_status_id \ |
|------|---|-----------------------|
| 142  | This is Meatball. He doing what's known in the... | NaN                   |
| 735  | We normally don't rate lobsters, but this one ... | NaN                   |
| 1451 | This is Wyatt. His throne is modeled after him... | NaN                   |
| 301  | Say hello to Oliver. He's pretty exotic. Fairl... | NaN                   |
| 2208 | This is Maks. Maks just noticed something wasn... | NaN                   |

|      | retweeted_status_user_id | retweeted_status_timestamp \ |
|------|--------------------------|------------------------------|
| 142  | NaN                      | NaN                          |
| 735  | NaN                      | NaN                          |
| 1451 | NaN                      | NaN                          |
| 301  | NaN                      | NaN                          |
| 2208 | NaN                      | NaN                          |

|      | expanded_urls                                     | rating_numerator \ |
|------|---|--------------------|
| 142  | https://twitter.com/dog_rates/status/864279568... | 12                 |
| 735  | https://twitter.com/dog_rates/status/781163403... | 10                 |
| 1451 | https://twitter.com/dog_rates/status/695794761... | 13                 |
| 301  | https://twitter.com/dog_rates/status/836677758... | 11                 |
| 2208 | https://twitter.com/dog_rates/status/668625577... | 10                 |

|      | rating_denominator | name     | doggo | floofer | pupper | puppo | contributors \ |
|------|--------------------|----------|-------|---------|--------|-------|----------------|
| 142  | 10                 | Meatball | None  | None    | None   | None  | NaN            |
| 735  | 10                 | None     | None  | None    | None   | None  | NaN            |
| 1451 | 10                 | Wyatt    | None  | None    | None   | None  | NaN            |
| 301  | 10                 | Oliver   | None  | None    | None   | None  | NaN            |
| 2208 | 10                 | Maks     | None  | None    | None   | None  | NaN            |

| coordinates | created_at | display_text_range \ |
|-------------|------------|----------------------|
|-------------|------------|----------------------|

|      |     |                     |          |
|------|-----|---------------------|----------|
| 142  | NaN | 2017-05-16 00:41:21 | [0, 129] |
| 735  | NaN | 2016-09-28 16:07:23 | [0, 111] |
| 1451 | NaN | 2016-02-06 02:22:53 | [0, 102] |
| 301  | NaN | 2017-02-28 20:41:37 | [0, 130] |
| 2208 | NaN | 2015-11-23 03:02:14 | [0, 85]  |

|      | entities \  |
|------|---|
| 142  | {'hashtags': [], 'symbols': [], 'user_mentions... |
| 735  | {'hashtags': [], 'symbols': [], 'user_mentions... |
| 1451 | {'hashtags': [], 'symbols': [], 'user_mentions... |
| 301  | {'hashtags': [], 'symbols': [], 'user_mentions... |
| 2208 | {'hashtags': [], 'symbols': [], 'user_mentions... |

|      | extended_entities                                  | favorite_count \ |
|------|--|------------------|
| 142  | {'media': [{ 'id': 864279556340957184, 'id_str'... | 13695.0          |
| 735  | {'media': [{ 'id': 781163395106082816, 'id_str'... | 9782.0           |
| 1451 | {'media': [{ 'id': 695794756677410817, 'id_str'... | 3092.0           |
| 301  | {'media': [{ 'id': 836677701918392320, 'id_str'... | 12426.0          |
| 2208 | {'media': [{ 'id': 668625572470366208, 'id_str'... | 360.0            |

|      | favorited | full_text   | geo \ |
|------|-----------|---|-------|
| 142  | False     | This is Meatball. He doing what's known in the... | NaN   |
| 735  | False     | We normally don't rate lobsters, but this one ... | NaN   |
| 1451 | False     | This is Wyatt. His throne is modeled after him... | NaN   |
| 301  | False     | Say hello to Oliver. He's pretty exotic. Fairl... | NaN   |
| 2208 | False     | This is Maks. Maks just noticed something wasn... | NaN   |

|      | id_str       | in_reply_to_screen_name | in_reply_to_status_id_y \ |
|------|--------------|-------------------------|---------------------------|
| 142  | 8.642796e+17 | None                    | NaN                       |
| 735  | 7.811634e+17 | None                    | NaN                       |
| 1451 | 6.957948e+17 | None                    | NaN                       |
| 301  | 8.366778e+17 | None                    | NaN                       |
| 2208 | 6.686256e+17 | None                    | NaN                       |

|      | in_reply_to_status_id_str | in_reply_to_user_id_y \ |
|------|---------------------------|-------------------------|
| 142  | NaN                       | NaN                     |
| 735  | NaN                       | NaN                     |
| 1451 | NaN                       | NaN                     |
| 301  | NaN                       | NaN                     |
| 2208 | NaN                       | NaN                     |

|      | in_reply_to_user_id_str | is_quote_status | lang | place | possibly_sensitive \ |
|------|-------------------------|-----------------|------|-------|----------------------|
| 142  | NaN                     | False           | en   | None  | 0.0                  |
| 735  | NaN                     | False           | en   | None  | 0.0                  |
| 1451 | NaN                     | False           | en   | None  | 0.0                  |
| 301  | NaN                     | False           | en   | None  | 0.0                  |
| 2208 | NaN                     | False           | en   | None  | 0.0                  |



|      | possibly_sensitive_appealable | quoted_status | quoted_status_id | \ |
|------|-------------------------------|---------------|------------------|---|
| 142  | 0.0                           | NaN           | NaN              |   |
| 735  | 0.0                           | NaN           | NaN              |   |
| 1451 | 0.0                           | NaN           | NaN              |   |
| 301  | 0.0                           | NaN           | NaN              |   |
| 2208 | 0.0                           | NaN           | NaN              |   |

|      | quoted_status_id_str | quoted_status_permalink | retweet_count | retweeted | \ |
|------|----------------------|-------------------------|---------------|-----------|---|
| 142  | NaN                  | NaN                     | 2768.0        | False     |   |
| 735  | NaN                  | NaN                     | 2748.0        | False     |   |
| 1451 | NaN                  | NaN                     | 750.0         | False     |   |
| 301  | NaN                  | NaN                     | 2189.0        | False     |   |
| 2208 | NaN                  | NaN                     | 121.0         | False     |   |

|      | retweeted_status | source_y  | \ |
|------|------------------|---|---|
| 142  | NaN              | <a href="http://twitter.com/download/iphone" r... |   |
| 735  | NaN              | <a href="http://twitter.com/download/iphone" r... |   |
| 1451 | NaN              | <a href="http://twitter.com/download/iphone" r... |   |
| 301  | NaN              | <a href="http://twitter.com/download/iphone" r... |   |
| 2208 | NaN              | <a href="http://twitter.com/download/iphone" r... |   |

|      | truncated | user  | \ |
|------|-----------|---|---|
| 142  | False     | {'id': 4196983835, 'id_str': '4196983835', 'na... |   |
| 735  | False     | {'id': 4196983835, 'id_str': '4196983835', 'na... |   |
| 1451 | False     | {'id': 4196983835, 'id_str': '4196983835', 'na... |   |
| 301  | False     | {'id': 4196983835, 'id_str': '4196983835', 'na... |   |
| 2208 | False     | {'id': 4196983835, 'id_str': '4196983835', 'na... |   |

|      | jpg_url   | img_num | \ |
|------|---|---------|---|
| 142  | https://pbs.twimg.com/media/C_6JrWZVwAAHhCD.jpg | 1.0     |   |
| 735  | https://pbs.twimg.com/media/Ctc_-BTWEAAQpZh.jpg | 1.0     |   |
| 1451 | https://pbs.twimg.com/media/Caf1pQxWIAEme3q.jpg | 1.0     |   |
| 301  | https://pbs.twimg.com/media/C5x57-TWUAEawQh.jpg | 2.0     |   |
| 2208 | https://pbs.twimg.com/media/CUdvambWoAA007z.jpg | 1.0     |   |

|      | p1                | p1_conf  | p1_dog | p2             | p2_conf  | p2_dog | \ |
|------|-------------------|----------|--------|----------------|----------|--------|---|
| 142  | bull_mastiff      | 0.668613 | True   | French_bulldog | 0.180562 | True   |   |
| 735  | Shetland_sheepdog | 0.973841 | True   | collie         | 0.025188 | True   |   |
| 1451 | Samoyed           | 0.962139 | True   | Arctic_fox     | 0.030553 | False  |   |
| 301  | leopard           | 0.797410 | False  | jaguar         | 0.095487 | False  |   |
| 2208 | ox                | 0.071536 | False  | groenendael    | 0.054455 | True   |   |

|      | p3                        | p3_conf  | p3_dog |
|------|---------------------------|----------|--------|
| 142  | Staffordshire_bullterrier | 0.052237 | True   |
| 735  | Border_collie             | 0.000297 | True   |
| 1451 | white_wolf                | 0.001482 | False  |
| 301  | snow_leopard              | 0.079694 | False  |
| 2208 | Angora                    | 0.045028 | False  |

Prior to assessing for quality and tidiness, I went ahead and merged the three tables together via `pd.merge` using the full outer method. This aggregated all the data together and thus allowed me to assess the quality and tidiness in a single dataframe.

**Quality** 1. Timestamp information isn't in datetime format and contains unnecessary information. 2. Population contains retweets and replies. 3. Retweet count is in float format. 4. Favorite count is in float format and has invalid counts. 5. Various unnecessary columns containing many NaN/Null/None data. 6. Not all tweets have an associated image. 7. Various invalid dog names such as "a" or NaN/Null/None. 8. Invalid dog types in the p1/p2/p3 columns. 9. Invalid rating denominator.

**Tidiness** 1. Multiple data store in a columns: entities/extended\_entities. 2. Data that should be stored in a single column is stored in multiple: doggo/floofer/pupper/puppo dog types.

```
In [160]: # quality 1
          df = df.drop(columns = ['timestamp'])

In [161]: # quality 2
          df = df[df.in_reply_to_status_id_x.notnull() == False]

In [162]: # quality 3
          df.retweet_count = df.retweet_count.values.astype(int)
          df = df[df['retweet_count'] > 0]

In [163]: # quality 4
          df.favorite_count = df.favorite_count.values.astype(int)
          df = df[df['favorite_count'] > 0]

In [164]: # quality 5

          # columns with null/non/nan
          df = df.drop(columns = ['in_reply_to_status_id_x',
                                  'in_reply_to_user_id_x',
                                  'retweeted_status_id',
                                  'retweeted_status_user_id',
                                  'retweeted_status_timestamp',
                                  'contributors',
                                  'coordinates',
                                  'geo',
                                  'in_reply_to_screen_name',
                                  'in_reply_to_status_id_y',
                                  'in_reply_to_status_id_str',
                                  'quoted_status_permalink',
                                  'retweeted_status',
                                  'in_reply_to_user_id_y',
                                  'in_reply_to_user_id_str',
                                  'quoted_status',
                                  'quoted_status_id',
                                  'quoted_status_id_str',
                                  'place'])
```

```

# columns not necessary
df = df.drop(columns = ['display_text_range',
                        'favorited',
                        'full_text',
                        'id_str',
                        'is_quote_status',
                        'lang',
                        'possibly_sensitive',
                        'possibly_sensitive_appealable',
                        'retweeted',
                        'source_y',
                        'truncated',
                        'img_num',
                        'source_x'])

```

```

In [165]: # quality 6
df = df[df['jpg_url'].notnull() == True]

```

```

In [166]: # quality 7
df.name.value_counts()

```

```

Out[166]: None          524
a                    55
Oliver              10
Cooper              10
Charlie             10
Lucy                 9
Penny               9
Tucker              9
Sadie               8
Winston             8
the                  7
Toby                 7
Lola                 7
Daisy               7
Bella               6
Bo                  6
Stanley             6
Jax                 6
an                  6
Koda                6
Scout               5
Buddy              5
Milo                5
Chester             5
Dave                5
Rusty               5
Leo                 5

```

|          |   |
|----------|---|
| Louis    | 5 |
| Oscar    | 5 |
| Bailey   | 5 |
| Gus      | 4 |
| very     | 4 |
| Brody    | 4 |
| Larry    | 4 |
| Gary     | 4 |
| Finn     | 4 |
| Alfie    | 4 |
| Archie   | 4 |
| Clark    | 4 |
| Clarence | 4 |
| Phil     | 4 |
| Jerry    | 4 |
| Cassie   | 4 |
| Dexter   | 4 |
| Jack     | 4 |
| Winnie   | 4 |
| Sophie   | 4 |
| Maggie   | 4 |
| Scooter  | 4 |
| George   | 4 |
| one      | 4 |
| Oakley   | 4 |
| Bear     | 4 |
| Derek    | 4 |
| Duke     | 4 |
| Bentley  | 4 |
| Chip     | 4 |
| Beau     | 3 |
| Kyle     | 3 |
| Mia      | 3 |
| Shadow   | 3 |
| Louie    | 3 |
| Rosie    | 3 |
| Boomer   | 3 |
| Wilson   | 3 |
| Vincent  | 3 |
| Ellie    | 3 |
| Riley    | 3 |
| Moose    | 3 |
| Nala     | 3 |
| Jeffrey  | 3 |
| Walter   | 3 |
| Reese    | 3 |
| Hank     | 3 |
| Gerald   | 3 |

|           |   |
|-----------|---|
| Earl      | 3 |
| Reggie    | 3 |
| Sebastian | 3 |
| Calvin    | 3 |
| Olive     | 3 |
| Wallace   | 3 |
| Bruce     | 3 |
| Otis      | 3 |
| Malcolm   | 3 |
| Zoey      | 3 |
| Jimothy   | 3 |
| just      | 3 |
| Lily      | 3 |
| Gizmo     | 3 |
| Ruby      | 3 |
| Loki      | 3 |
| quite     | 3 |
| Max       | 3 |
| Waffles   | 3 |
| Sunny     | 3 |
| Samson    | 3 |
| Steven    | 3 |
| Zeke      | 3 |
| Wyatt     | 3 |
| Jiminy    | 2 |
| Moe       | 2 |
| Cody      | 2 |
| Eli       | 2 |
| Curtis    | 2 |
| Benedict  | 2 |
| Kenneth   | 2 |
| Luca      | 2 |
| Tyr       | 2 |
| Atlas     | 2 |
| Roosevelt | 2 |
| Watson    | 2 |
| Lennon    | 2 |
| Churlie   | 2 |
| Trooper   | 2 |
| Crystal   | 2 |
| Ava       | 2 |
| Ollie     | 2 |
| Elliot    | 2 |
| Solomon   | 2 |
| Belle     | 2 |
| Flávio    | 2 |
| Smokey    | 2 |
| Hunter    | 2 |

|          |   |
|----------|---|
| Marley   | 2 |
| Hammond  | 2 |
| Fiona    | 2 |
| Phred    | 2 |
| Alice    | 2 |
| Cash     | 2 |
| Panda    | 2 |
| Sam      | 2 |
| Opal     | 2 |
| Kreggory | 2 |
| Nelly    | 2 |
| Lou      | 2 |
| Bubbles  | 2 |
| Kreg     | 2 |
| Carl     | 2 |
| Sampson  | 2 |
| Jesse    | 2 |
| CeCe     | 2 |
| Misty    | 2 |
| Juno     | 2 |
| Frank    | 2 |
| Lorenzo  | 2 |
| Maximus  | 2 |
| Sandy    | 2 |
| Pickles  | 2 |
| Sansa    | 2 |
| Cupcake  | 2 |
| Griffin  | 2 |
| Calbert  | 2 |
| Kilo     | 2 |
| Doc      | 2 |
| Klevin   | 2 |
| Brad     | 2 |
| Jackson  | 2 |
| Harold   | 2 |
| Pippa    | 2 |
| Chuckles | 2 |
| Jimison  | 2 |
| Kirby    | 2 |
| Abby     | 2 |
| Coco     | 2 |
| Axel     | 2 |
| Theodore | 2 |
| Neptune  | 2 |
| Bernie   | 2 |
| Django   | 2 |
| Gabe     | 2 |
| Ash      | 2 |

|           |   |
|-----------|---|
| Finley    | 2 |
| Sugar     | 2 |
| Yogi      | 2 |
| Lenny     | 2 |
| Paisley   | 2 |
| Jeph      | 2 |
| Bisquick  | 2 |
| Terry     | 2 |
| Albus     | 2 |
| Colby     | 2 |
| Oliviér   | 2 |
| Romeo     | 2 |
| getting   | 2 |
| Olivia    | 2 |
| Keith     | 2 |
| Benji     | 2 |
| Chet      | 2 |
| Raymond   | 2 |
| Indie     | 2 |
| Herm      | 2 |
| Atticus   | 2 |
| Lincoln   | 2 |
| Hobbes    | 2 |
| Remington | 2 |
| Dash      | 2 |
| Linda     | 2 |
| Penelope  | 2 |
| Wally     | 2 |
| Doug      | 2 |
| Peaches   | 2 |
| Aspen     | 2 |
| Franklin  | 2 |
| Mister    | 2 |
| Dakota    | 2 |
| Odie      | 2 |
| Sammy     | 2 |
| Rory      | 2 |
| Maxaroni  | 2 |
| Patrick   | 2 |
| Kevin     | 2 |
| Reginald  | 2 |
| Albert    | 2 |
| Thumas    | 2 |
| Rufus     | 2 |
| Chipson   | 2 |
| Charles   | 2 |
| Frankie   | 2 |
| Herald    | 2 |

|            |   |
|------------|---|
| Titan      | 2 |
| Percy      | 2 |
| Bob        | 2 |
| Phineas    | 2 |
| Sarge      | 2 |
| Ted        | 2 |
| Rocky      | 2 |
| Piper      | 2 |
| Baxter     | 2 |
| Coops      | 2 |
| Kallie     | 1 |
| Saydee     | 1 |
| Rontu      | 1 |
| Sonny      | 1 |
| Kota       | 1 |
| Puff       | 1 |
| Ebby       | 1 |
| Edgar      | 1 |
| Eugene     | 1 |
| Chelsea    | 1 |
| Chubbs     | 1 |
| Stuart     | 1 |
| Ron        | 1 |
| Angel      | 1 |
| this       | 1 |
| Aldrick    | 1 |
| Rooney     | 1 |
| Napolean   | 1 |
| Christoper | 1 |
| Alejandro  | 1 |
| Raphael    | 1 |
| Beemo      | 1 |
| Leonard    | 1 |
| Pinot      | 1 |
| Divine     | 1 |
| Blakely    | 1 |
| Ike        | 1 |
| Cecil      | 1 |
| Tom        | 1 |
| incredibly | 1 |
| Chesterson | 1 |
| Ralph      | 1 |
| Gilbert    | 1 |
| Trip       | 1 |
| Ken        | 1 |
| Marlee     | 1 |
| Nico       | 1 |
| Jim        | 1 |



|           |   |
|-----------|---|
| Smiley    | 1 |
| Dylan     | 1 |
| all       | 1 |
| Sparky    | 1 |
| Richie    | 1 |
| Humphrey  | 1 |
| Zeus      | 1 |
| Amber     | 1 |
| Pubert    | 1 |
| Bruiser   | 1 |
| Crouton   | 1 |
| Monty     | 1 |
| Marvin    | 1 |
| Glacier   | 1 |
| Mona      | 1 |
| Shadoe    | 1 |
| Charl     | 1 |
| Sweet     | 1 |
| Sobe      | 1 |
| Jeffrie   | 1 |
| Blu       | 1 |
| Stark     | 1 |
| Caryl     | 1 |
| Genevieve | 1 |
| Kloey     | 1 |
| Chevy     | 1 |
| Harper    | 1 |
| Aja       | 1 |
| Kona      | 1 |
| Duddles   | 1 |
| Pluto     | 1 |
| Rizzy     | 1 |
| Eevee     | 1 |
| Stu       | 1 |
| Jersey    | 1 |
| Chase     | 1 |
| Rumble    | 1 |
| Baloo     | 1 |
| Al        | 1 |
| Roscoe    | 1 |
| Pilot     | 1 |
| Toffee    | 1 |
| Howie     | 1 |
| Mattie    | 1 |
| Maya      | 1 |
| Akumi     | 1 |
| Blue      | 1 |
| Lolo      | 1 |

|           |   |
|-----------|---|
| Chesney   | 1 |
| Karma     | 1 |
| Zoe       | 1 |
| Mac       | 1 |
| Dunkin    | 1 |
| Remy      | 1 |
| Bodie     | 1 |
| Florence  | 1 |
| Kayla     | 1 |
| Anakin    | 1 |
| Norman    | 1 |
| Rueben    | 1 |
| Sky       | 1 |
| Kingsley  | 1 |
| Carbon    | 1 |
| Snoop     | 1 |
| Clarkus   | 1 |
| Rorie     | 1 |
| Shawwn    | 1 |
| Luther    | 1 |
| Rhino     | 1 |
| Molly     | 1 |
| Coleman   | 1 |
| Shnuggles | 1 |
| Grady     | 1 |
| Spencer   | 1 |
| Scott     | 1 |
| Dale      | 1 |
| Kara      | 1 |
| Bauer     | 1 |
| Pancake   | 1 |
| Chef      | 1 |
| Buddah    | 1 |
| Travis    | 1 |
| Rodney    | 1 |
| Timofy    | 1 |
| Duchess   | 1 |
| DonDon    | 1 |
| Bradlay   | 1 |
| Nollie    | 1 |
| Darrel    | 1 |
| Dug       | 1 |
| Pete      | 1 |
| Gert      | 1 |
| Bones     | 1 |
| light     | 1 |
| by        | 1 |
| Bell      | 1 |

|            |   |
|------------|---|
| Chompsky   | 1 |
| Lipton     | 1 |
| Corey      | 1 |
| Bradley    | 1 |
| Bobbay     | 1 |
| Kobe       | 1 |
| Eleanor    | 1 |
| Butters    | 1 |
| Charleson  | 1 |
| Jomathan   | 1 |
| Tommy      | 1 |
| Hanz       | 1 |
| Blanket    | 1 |
| Hercules   | 1 |
| Loomis     | 1 |
| Covach     | 1 |
| Iggy       | 1 |
| Fynn       | 1 |
| Oreo       | 1 |
| Zooey      | 1 |
| Snicku     | 1 |
| Maddie     | 1 |
| Alexander  | 1 |
| Bronte     | 1 |
| Levi       | 1 |
| O          | 1 |
| Strudel    | 1 |
| Josep      | 1 |
| Mike       | 1 |
| Alfy       | 1 |
| Mo         | 1 |
| Barclay    | 1 |
| Kane       | 1 |
| Baron      | 1 |
| Hermione   | 1 |
| Marq       | 1 |
| Andy       | 1 |
| officially | 1 |
| Creg       | 1 |
| Kevon      | 1 |
| Mutt       | 1 |
| Nimbus     | 1 |
| Willie     | 1 |
| Hero       | 1 |
| Brutus     | 1 |
| Spark      | 1 |
| Mitch      | 1 |
| Kaia       | 1 |

|             |   |
|-------------|---|
| Ambrose     | 1 |
| Hazel       | 1 |
| Ito         | 1 |
| Miley       | 1 |
| Emma        | 1 |
| Gerbald     | 1 |
| Geoff       | 1 |
| Maude       | 1 |
| Pavlov      | 1 |
| Timison     | 1 |
| Tess        | 1 |
| Kyro        | 1 |
| Willy       | 1 |
| Dook        | 1 |
| Gustav      | 1 |
| Canela      | 1 |
| Griswold    | 1 |
| Bode        | 1 |
| Bubba       | 1 |
| Ronduh      | 1 |
| Lili        | 1 |
| Wiggles     | 1 |
| Lilli       | 1 |
| Striker     | 1 |
| Ole         | 1 |
| Shelby      | 1 |
| Nigel       | 1 |
| Livvie      | 1 |
| Jessiga     | 1 |
| Jockson     | 1 |
| Rufio       | 1 |
| Carter      | 1 |
| Murphy      | 1 |
| Finnegus    | 1 |
| Sunshine    | 1 |
| Tiger       | 1 |
| Ziva        | 1 |
| Eve         | 1 |
| Todo        | 1 |
| Bluebert    | 1 |
| Lilly       | 1 |
| Poppy       | 1 |
| Jarod       | 1 |
| Shakespeare | 1 |
| Randall     | 1 |
| Bookstore   | 1 |
| Ralphé      | 1 |
| Moofasa     | 1 |

|           |   |
|-----------|---|
| Stefan    | 1 |
| Kuyu      | 1 |
| Stella    | 1 |
| Obie      | 1 |
| Cheryl    | 1 |
| Mairi     | 1 |
| Horace    | 1 |
| Cuddles   | 1 |
| Anthony   | 1 |
| Cal       | 1 |
| Jeb       | 1 |
| Fred      | 1 |
| Tito      | 1 |
| Jarvis    | 1 |
| Dante     | 1 |
| Brownie   | 1 |
| Kirk      | 1 |
| Cermet    | 1 |
| Stubert   | 1 |
| Aqua      | 1 |
| Schnitzel | 1 |
| Yoda      | 1 |
| Pepper    | 1 |
| Luna      | 1 |
| Devón     | 1 |
| Doobert   | 1 |
| Hamrick   | 1 |
| Severus   | 1 |
| Jeffri    | 1 |
| Lassie    | 1 |
| Walker    | 1 |
| Tino      | 1 |
| Marty     | 1 |
| Claude    | 1 |
| Monkey    | 1 |
| Lorelei   | 1 |
| Jordy     | 1 |
| Colin     | 1 |
| Maisey    | 1 |
| Henry     | 1 |
| Mack      | 1 |
| Odin      | 1 |
| Dawn      | 1 |
| Ivar      | 1 |
| Link      | 1 |
| Katie     | 1 |
| Hubertson | 1 |
| Pawnd     | 1 |

|              |   |
|--------------|---|
| Taco         | 1 |
| Ester        | 1 |
| Maks         | 1 |
| Gòrdón       | 1 |
| Ruffles      | 1 |
| Fillup       | 1 |
| Tyrus        | 1 |
| Carper       | 1 |
| Emmy         | 1 |
| Callie       | 1 |
| Millie       | 1 |
| Brat         | 1 |
| Sid          | 1 |
| Danny        | 1 |
| Hall         | 1 |
| Gidget       | 1 |
| Grizzie      | 1 |
| Pablo        | 1 |
| Deacon       | 1 |
| Mojo         | 1 |
| Swagger      | 1 |
| Herschel     | 1 |
| Jay          | 1 |
| Tilly        | 1 |
| Tripp        | 1 |
| Tove         | 1 |
| Alexanderson | 1 |
| Thor         | 1 |
| Jiminus      | 1 |
| Opie         | 1 |
| Mary         | 1 |
| Brooks       | 1 |
| Clarq        | 1 |
| Miguel       | 1 |
| Winifred     | 1 |
| Obi          | 1 |
| Rumpole      | 1 |
| Lulu         | 1 |
| Chuq         | 1 |
| Jeremy       | 1 |
| Tango        | 1 |
| Timmy        | 1 |
| Kathmandu    | 1 |
| Reptar       | 1 |
| Mosby        | 1 |
| Daniel       | 1 |
| Sailor       | 1 |
| Jed          | 1 |

|              |   |
|--------------|---|
| Billl        | 1 |
| Butter       | 1 |
| Mark         | 1 |
| Rinna        | 1 |
| Naphaniel    | 1 |
| Quinn        | 1 |
| Gromit       | 1 |
| Fletcher     | 1 |
| Mya          | 1 |
| Antony       | 1 |
| Trevith      | 1 |
| Joey         | 1 |
| Bonaparte    | 1 |
| Billy        | 1 |
| Arnie        | 1 |
| Philippe     | 1 |
| Asher        | 1 |
| Lambeau      | 1 |
| unacceptable | 1 |
| Kenzie       | 1 |
| Benny        | 1 |
| Harvey       | 1 |
| Mason        | 1 |
| Noah         | 1 |
| Dutch        | 1 |
| Noosh        | 1 |
| Damon        | 1 |
| Ulysses      | 1 |
| Margo        | 1 |
| Crumpet      | 1 |
| Geno         | 1 |
| Rolf         | 1 |
| his          | 1 |
| Tyrone       | 1 |
| Clybe        | 1 |
| Huxley       | 1 |
| Birf         | 1 |
| Gordon       | 1 |
| Venti        | 1 |
| Pippin       | 1 |
| Jett         | 1 |
| Frönq        | 1 |
| Timber       | 1 |
| Torque       | 1 |
| Ronnie       | 1 |
| Bobby        | 1 |
| Sundance     | 1 |
| Willem       | 1 |

|              |   |
|--------------|---|
| Tuck         | 1 |
| space        | 1 |
| Heinrich     | 1 |
| Boston       | 1 |
| Jackie       | 1 |
| Godzilla     | 1 |
| Tonks        | 1 |
| Mingus       | 1 |
| Banjo        | 1 |
| Pupcasso     | 1 |
| Ozzy         | 1 |
| Karl         | 1 |
| Arlo         | 1 |
| Fido         | 1 |
| Eriq         | 1 |
| Halo         | 1 |
| Erik         | 1 |
| Flurpson     | 1 |
| Ralphus      | 1 |
| Tycho        | 1 |
| Tassy        | 1 |
| Dot          | 1 |
| Michelangelo | 1 |
| Strider      | 1 |
| Glenn        | 1 |
| Keet         | 1 |
| Siba         | 1 |
| Nida         | 1 |
| Tater        | 1 |
| Dixie        | 1 |
| Peanut       | 1 |
| Chaz         | 1 |
| Jonah        | 1 |
| Simba        | 1 |
| Sansom       | 1 |
| Dwight       | 1 |
| Grizz        | 1 |
| Cedrick      | 1 |
| Harrison     | 1 |
| infuriating  | 1 |
| Bruno        | 1 |
| Tebow        | 1 |
| William      | 1 |
| Vince        | 1 |
| Chloe        | 1 |
| Augie        | 1 |
| Sully        | 1 |
| Mookie       | 1 |



|           |   |
|-----------|---|
| Grey      | 1 |
| Jareld    | 1 |
| Goose     | 1 |
| Spanky    | 1 |
| Pipsy     | 1 |
| Franq     | 1 |
| Karll     | 1 |
| Kramer    | 1 |
| Rey       | 1 |
| Blitz     | 1 |
| Crimson   | 1 |
| Darla     | 1 |
| Gustaf    | 1 |
| Filup     | 1 |
| Ben       | 1 |
| Edd       | 1 |
| Lilah     | 1 |
| Mauve     | 1 |
| Snoopy    | 1 |
| Koko      | 1 |
| General   | 1 |
| Kial      | 1 |
| Boots     | 1 |
| Aubie     | 1 |
| Trigger   | 1 |
| Farfle    | 1 |
| Wafer     | 1 |
| Oshie     | 1 |
| Lacy      | 1 |
| Davey     | 1 |
| Sandra    | 1 |
| Perry     | 1 |
| Banditt   | 1 |
| Grizzwald | 1 |
| Joshwa    | 1 |
| Berkeley  | 1 |
| Julio     | 1 |
| Wesley    | 1 |
| Brockly   | 1 |
| Shikha    | 1 |
| Arlen     | 1 |
| Dobby     | 1 |
| Sephie    | 1 |
| Major     | 1 |
| Mollie    | 1 |
| Amélie    | 1 |
| Paull     | 1 |
| Layla     | 1 |

|            |   |
|------------|---|
| Dido       | 1 |
| Logan      | 1 |
| Kellogg    | 1 |
| Bungalo    | 1 |
| Arnold     | 1 |
| Edmund     | 1 |
| Bobble     | 1 |
| DayZ       | 1 |
| Ginger     | 1 |
| Durg       | 1 |
| Bert       | 1 |
| River      | 1 |
| Vinscent   | 1 |
| Dallas     | 1 |
| Jazz       | 1 |
| Jangle     | 1 |
| Enchilada  | 1 |
| Rizzo      | 1 |
| Holly      | 1 |
| Terrance   | 1 |
| Keurig     | 1 |
| Bertson    | 1 |
| Petrick    | 1 |
| Ashleigh   | 1 |
| Liam       | 1 |
| Mabel      | 1 |
| Jessifer   | 1 |
| Biden      | 1 |
| Derby      | 1 |
| Andru      | 1 |
| Anna       | 1 |
| Kaiya      | 1 |
| Nugget     | 1 |
| Jazzy      | 1 |
| Aiden      | 1 |
| Huck       | 1 |
| Stephan    | 1 |
| Patch      | 1 |
| Jaycob     | 1 |
| Leonidas   | 1 |
| Kenny      | 1 |
| Bayley     | 1 |
| Rover      | 1 |
| Burt       | 1 |
| Amy        | 1 |
| Brandonald | 1 |
| Lucky      | 1 |
| Laika      | 1 |

|            |   |
|------------|---|
| Berb       | 1 |
| Ed         | 1 |
| Beya       | 1 |
| Wishes     | 1 |
| Tanner     | 1 |
| Monster    | 1 |
| JD         | 1 |
| Lenox      | 1 |
| Tedders    | 1 |
| Staniel    | 1 |
| Klein      | 1 |
| Shiloh     | 1 |
| Bowie      | 1 |
| Maxwell    | 1 |
| Bloo       | 1 |
| Happy      | 1 |
| Meyer      | 1 |
| Champ      | 1 |
| Longfellow | 1 |
| Skittles   | 1 |
| Superpup   | 1 |
| Vinnie     | 1 |
| Robin      | 1 |
| Evy        | 1 |
| Rodman     | 1 |
| Binky      | 1 |
| Bilbo      | 1 |
| Meera      | 1 |
| Cannon     | 1 |
| Lance      | 1 |
| Kanu       | 1 |
| Herb       | 1 |
| Bobb       | 1 |
| Shaggy     | 1 |
| Harnold    | 1 |
| Leela      | 1 |
| Hector     | 1 |
| Ricky      | 1 |
| Rose       | 1 |
| Sojourner  | 1 |
| Theo       | 1 |
| Reagan     | 1 |
| Julius     | 1 |
| Lupe       | 1 |
| Philbert   | 1 |
| Ralphie    | 1 |
| Tayzie     | 1 |
| Lillie     | 1 |

|           |   |
|-----------|---|
| Scruffers | 1 |
| Tug       | 1 |
| Clifford  | 1 |
| Arya      | 1 |
| Schnozz   | 1 |
| Cupid     | 1 |
| such      | 1 |
| Steve     | 1 |
| Autumn    | 1 |
| Pip       | 1 |
| Orion     | 1 |
| Jamesy    | 1 |
| Tobi      | 1 |
| Comet     | 1 |
| Coopson   | 1 |
| Crawford  | 1 |
| Tupawc    | 1 |
| Rambo     | 1 |
| Harlso    | 1 |
| Jimbo     | 1 |
| Taz       | 1 |
| Kawhi     | 1 |
| Donny     | 1 |
| Jennifur  | 1 |
| Batdog    | 1 |
| Ace       | 1 |
| Shooter   | 1 |
| Jameson   | 1 |
| Newt      | 1 |
| actually  | 1 |
| not       | 1 |
| Fiji      | 1 |
| Brady     | 1 |
| Blipson   | 1 |
| Emanuel   | 1 |
| Brandy    | 1 |
| Apollo    | 1 |
| Carll     | 1 |
| Stormy    | 1 |
| Beebop    | 1 |
| Eazy      | 1 |
| Socks     | 1 |
| Pumpkin   | 1 |
| Barney    | 1 |
| Sage      | 1 |
| Betty     | 1 |
| Kulet     | 1 |
| Kody      | 1 |

|              |   |
|--------------|---|
| Fwed         | 1 |
| Chuck        | 1 |
| Carly        | 1 |
| Diogi        | 1 |
| Terrenth     | 1 |
| Darby        | 1 |
| Georgie      | 1 |
| Ralphson     | 1 |
| Iroh         | 1 |
| Rubio        | 1 |
| my           | 1 |
| Dietrich     | 1 |
| Goliath      | 1 |
| Cali         | 1 |
| Mimosa       | 1 |
| Rilo         | 1 |
| Adele        | 1 |
| Kendall      | 1 |
| Godi         | 1 |
| Fizz         | 1 |
| Flash        | 1 |
| Brandi       | 1 |
| Brian        | 1 |
| Zara         | 1 |
| Rupert       | 1 |
| Suki         | 1 |
| Rocco        | 1 |
| Dex          | 1 |
| Tuco         | 1 |
| Jo           | 1 |
| Kollin       | 1 |
| Gunner       | 1 |
| Remus        | 1 |
| Milky        | 1 |
| Malikai      | 1 |
| Beckham      | 1 |
| Sprout       | 1 |
| Snickers     | 1 |
| Olaf         | 1 |
| Emmie        | 1 |
| Cleopatrícia | 1 |
| BeBe         | 1 |
| Skye         | 1 |
| Juckson      | 1 |
| Vixen        | 1 |
| Ralpher      | 1 |
| Ozzie        | 1 |
| Traviss      | 1 |

|           |   |
|-----------|---|
| Freddery  | 1 |
| Einstein  | 1 |
| Sprinkles | 1 |
| Tedrick   | 1 |
| Ridley    | 1 |
| Meatball  | 1 |
| Dudley    | 1 |
| Jerome    | 1 |
| Lucia     | 1 |
| Cheesy    | 1 |
| Zeek      | 1 |
| Lizzie    | 1 |
| Stephanus | 1 |
| Brudge    | 1 |
| Sierra    | 1 |
| Laela     | 1 |
| Moreton   | 1 |
| Buckley   | 1 |
| Willow    | 1 |
| Sora      | 1 |
| Stewie    | 1 |
| Cilantro  | 1 |
| Zuzu      | 1 |
| Hurley    | 1 |
| Lugan     | 1 |
| Craig     | 1 |
| Furzey    | 1 |
| Acro      | 1 |
| Storkson  | 1 |
| Dotsy     | 1 |
| Ralf      | 1 |
| Jebberson | 1 |
| Clyde     | 1 |
| Chadrick  | 1 |
| Gin       | 1 |
| Sailer    | 1 |
| Bloop     | 1 |
| Jaspers   | 1 |
| Alf       | 1 |
| Fabio     | 1 |
| Dewey     | 1 |
| Cora      | 1 |

Name: name, dtype: int64

```
In [167]: # quality 7
          name_remove = ['None',
                        'a']
```

```
In [168]: # quality 7
```

```

df = df[~df.name.isin(name_remove)]

In [169]: # quality 8
df = df.groupby('p1').filter(lambda x: len(x) > 1)
df = df.groupby('p2').filter(lambda x: len(x) > 1)
df = df.groupby('p3').filter(lambda x: len(x) > 1)

In [170]: # quality 8
df['p1'].value_counts()

Out[170]: golden_retriever          91
Pembroke                           63
Labrador_retriever                 56
Chihuahua                         50
pug                               36
Pomeranian                       25
chow                             25
toy_poodle                       22
malamute                         20
French_bulldog                   19
Samoyed                          19
cocker_spaniel                   18
Siberian_husky                   18
miniature_pinscher               16
Staffordshire_bullterrier        15
Shih-Tzu                        15
Chesapeake_Bay_retriever        14
German_shepherd                  14
Shetland_sheepdog                14
beagle                          13
seat_belt                        13
Cardigan                        12
Pekinese                        11
Eskimo_dog                       11
basset                          10
Maltese_dog                      10
Italian_greyhound                10
collie                          10
Border_collie                    10
vizsla                          9
Lakeland_terrier                 9
kuvasz                          9
Old_English_sheepdog             9
Rottweiler                      9
American_Staffordshire_terrier   9
Airedale                        8
teddy                           8
Doberman                        8

```

|                             |   |
|-----------------------------|---|
| Bernese_mountain_dog        | 8 |
| Great_Pyrenees              | 8 |
| boxer                       | 7 |
| whippet                     | 7 |
| papillon                    | 7 |
| Blenheim_spaniel            | 7 |
| kelpie                      | 7 |
| Boston_bull                 | 7 |
| miniature_poodle            | 7 |
| Great_Dane                  | 7 |
| Brittany_spaniel            | 6 |
| Yorkshire_terrier           | 6 |
| Norwegian_elkhound          | 6 |
| Border_terrier              | 6 |
| schipperke                  | 6 |
| malinois                    | 6 |
| West_Highland_white_terrier | 6 |
| dingo                       | 6 |
| standard_poodle             | 5 |
| tennis_ball                 | 5 |
| English_setter              | 5 |
| bloodhound                  | 5 |
| dalmatian                   | 5 |
| soft-coated_wheaten_terrier | 5 |
| bull_mastiff                | 4 |
| Norfolk_terrier             | 4 |
| Siamese_cat                 | 4 |
| Dandie_Dinmont              | 4 |
| borzoi                      | 4 |
| German_short-haired_pointer | 4 |
| keeshond                    | 4 |
| English_springer            | 4 |
| Saint_Bernard               | 4 |
| bath_towel                  | 4 |
| flat-coated_retriever       | 3 |
| curly-coated_retriever      | 3 |
| tub                         | 3 |
| Mexican_hairless            | 3 |
| Lhasa                       | 3 |
| Weimaraner                  | 3 |
| porcupine                   | 3 |
| doormat                     | 3 |
| Irish_setter                | 3 |
| Norwich_terrier             | 3 |
| Bedlington_terrier          | 3 |
| Walker_hound                | 3 |
| Afghan_hound                | 3 |
| muzzle                      | 3 |



|                            |   |
|----------------------------|---|
| Tibetan_terrier            | 3 |
| ice_bear                   | 3 |
| swing                      | 3 |
| car_mirror                 | 3 |
| redbone                    | 2 |
| brown_bear                 | 2 |
| toy_terrier                | 2 |
| cairn                      | 2 |
| Saluki                     | 2 |
| giant_schnauzer            | 2 |
| acorn_squash               | 2 |
| shopping_cart              | 2 |
| bluetick                   | 2 |
| Rhodesian_ridgeback        | 2 |
| Gordon_setter              | 2 |
| basenji                    | 2 |
| badger                     | 2 |
| Australian_terrier         | 2 |
| Welsh_springer_spaniel     | 2 |
| Sussex_spaniel             | 2 |
| Tibetan_mastiff            | 2 |
| Ibizan_hound               | 2 |
| refrigerator               | 2 |
| jack-o'-lantern            | 2 |
| Irish_terrier              | 2 |
| Leonberg                   | 2 |
| miniature_schnauzer        | 2 |
| Greater_Swiss_Mountain_dog | 2 |
| sea_lion                   | 2 |
| ox                         | 2 |
| hamster                    | 2 |
| Arctic_fox                 | 2 |
| bathtub                    | 1 |
| seashore                   | 1 |
| Newfoundland               | 1 |
| wire-haired_fox_terrier    | 1 |
| space_heater               | 1 |
| ski_mask                   | 1 |
| komondor                   | 1 |
| hippopotamus               | 1 |
| ram                        | 1 |
| street_sign                | 1 |
| Irish_water_spaniel        | 1 |
| Scottish_deerhound         | 1 |
| dishwasher                 | 1 |
| llama                      | 1 |
| wombat                     | 1 |
| Name: p1, dtype: int64     |   |

```
In [171]: # quality 8
```

```
df['p2'].value_counts()
```

```
Out[171]: Labrador_retriever      62
golden_retriever                  55
Cardigan                          52
French_bulldog                    28
Pomeranian                       26
toy_poodle                        24
Chihuahua                        24
Chesapeake_Bay_retriever         24
miniature_poodle                 22
Pembroke                         22
Eskimo_dog                       21
collie                           21
Siberian_husky                   19
beagle                           18
cocker_spaniel                   18
Boston_bull                      16
Norwegian_elkhound              15
Pekinese                         15
miniature_pinscher              15
American_Staffordshire_terrier  14
Italian_greyhound               13
Samoyed                         13
kuvasz                          12
Staffordshire_bullterrier        12
malinois                        12
Irish_terrier                    11
pug                             11
toy_terrier                     10
Tibetan_mastiff                 10
basset                          10
boxer                           10
kelpie                          10
German_shepherd                 10
Great_Pyrenees                  9
Lhasa                           9
malamute                        9
Shih-Tzu                       9
West_Highland_white_terrier     9
whippet                         9
bull_mastiff                    9
Border_collie                   9
Shetland_sheepdog               9
borzoi                          8
Brabancon_griffon               8
redbone                         8
```

|                             |   |
|-----------------------------|---|
| Maltese_dog                 | 8 |
| Irish_setter                | 8 |
| chow                        | 7 |
| German_short-haired_pointer | 7 |
| Brittany_spaniel            | 7 |
| black-and-tan_coonhound     | 7 |
| English_springer            | 6 |
| seat_belt                   | 6 |
| teddy                       | 6 |
| groenendael                 | 6 |
| Rhodesian_ridgeback         | 6 |
| papillon                    | 6 |
| Saint_Bernard               | 5 |
| flat-coated_retriever       | 5 |
| Walker_hound                | 5 |
| vizsla                      | 5 |
| silky_terrier               | 5 |
| Sussex_spaniel              | 5 |
| basenji                     | 5 |
| Leonberg                    | 4 |
| standard_poodle             | 4 |
| Lakeland_terrier            | 4 |
| Border_terrier              | 4 |
| soft-coated_wheaten_terrier | 4 |
| Ibizan_hound                | 4 |
| Norwich_terrier             | 4 |
| bluetick                    | 4 |
| Tibetan_terrier             | 4 |
| ice_bear                    | 4 |
| Rottweiler                  | 4 |
| Great_Dane                  | 4 |
| schipperke                  | 4 |
| badger                      | 4 |
| Newfoundland                | 4 |
| Norfolk_terrier             | 4 |
| keeshond                    | 4 |
| bathtub                     | 3 |
| bath_towel                  | 3 |
| weasel                      | 3 |
| cairn                       | 3 |
| wire-haired_fox_terrier     | 3 |
| muzzle                      | 3 |
| Blenheim_spaniel            | 3 |
| tub                         | 3 |
| otterhound                  | 3 |
| Airedale                    | 3 |
| Saluki                      | 3 |
| Greater_Swiss_Mountain_dog  | 3 |

|                        |   |
|------------------------|---|
| hamster                | 3 |
| Mexican_hairless       | 3 |
| Welsh_springer_spaniel | 3 |
| Doberman               | 3 |
| Siamese_cat            | 3 |
| Appenzeller            | 3 |
| Old_English_sheepdog   | 2 |
| miniature_schnauzer    | 2 |
| carton                 | 2 |
| meerkat                | 2 |
| Persian_cat            | 2 |
| toilet_seat            | 2 |
| paddle                 | 2 |
| Christmas_stocking     | 2 |
| Weimaraner             | 2 |
| pillow                 | 2 |
| Arctic_fox             | 2 |
| bloodhound             | 2 |
| Yorkshire_terrier      | 2 |
| feather_boa            | 2 |
| Australian_terrier     | 2 |
| shopping_basket        | 2 |
| swab                   | 2 |
| Dandie_Dinmont         | 2 |
| Sealyham_terrier       | 2 |
| doormat                | 2 |
| English_setter         | 2 |
| Bedlington_terrier     | 2 |
| llama                  | 2 |
| guinea_pig             | 1 |
| sunglasses             | 1 |
| marmot                 | 1 |
| sea_lion               | 1 |
| hen                    | 1 |
| giant_schnauzer        | 1 |
| koala                  | 1 |
| briard                 | 1 |
| hog                    | 1 |
| black-footed_ferret    | 1 |

Name: p2, dtype: int64

```
In [172]: # quality 8
          df['p3'].value_counts()
```

```
Out[172]: Labrador_retriever    52
          Chihuahua              38
          kelpie                 28
          golden_retriever       23
```

|                                |    |
|--------------------------------|----|
| chow                           | 22 |
| Eskimo_dog                     | 22 |
| beagle                         | 21 |
| malamute                       | 20 |
| Pekinese                       | 20 |
| toy_poodle                     | 20 |
| kuvasz                         | 20 |
| cocker_spaniel                 | 20 |
| French_bulldog                 | 20 |
| Staffordshire_bullterrier      | 19 |
| Pembroke                       | 17 |
| Chesapeake_Bay_retriever       | 17 |
| Pomeranian                     | 17 |
| toy_terrier                    | 16 |
| American_Staffordshire_terrier | 15 |
| Cardigan                       | 15 |
| bull_mastiff                   | 14 |
| Great_Pyrenees                 | 14 |
| Boston_bull                    | 13 |
| pug                            | 13 |
| basenji                        | 13 |
| Lakeland_terrier               | 13 |
| Siberian_husky                 | 12 |
| Shetland_sheepdog              | 12 |
| German_shepherd                | 11 |
| Norfolk_terrier                | 11 |
| standard_poodle                | 10 |
| collie                         | 10 |
| miniature_poodle               | 10 |
| Tibetan_mastiff                | 10 |
| boxer                          | 10 |
| English_setter                 | 9  |
| doormat                        | 9  |
| Siamese_cat                    | 9  |
| West_Highland_white_terrier    | 9  |
| Maltese_dog                    | 9  |
| keeshond                       | 8  |
| seat_belt                      | 8  |
| dingo                          | 8  |
| Welsh_springer_spaniel         | 8  |
| Irish_terrier                  | 8  |
| Norwegian_elkhound             | 8  |
| Appenzeller                    | 8  |
| Rhodesian_ridgeback            | 7  |
| Saluki                         | 7  |
| Tibetan_terrier                | 7  |
| Brittany_spaniel               | 7  |
| Border_collie                  | 7  |

|                             |   |
|-----------------------------|---|
| Great_Dane                  | 7 |
| vizsla                      | 7 |
| papillon                    | 7 |
| miniature_pinscher          | 7 |
| whippet                     | 6 |
| Weimaraner                  | 6 |
| Doberman                    | 6 |
| borzoi                      | 6 |
| bloodhound                  | 6 |
| Rottweiler                  | 6 |
| Brabancon_griffon           | 6 |
| English_foxhound            | 6 |
| soft-coated_wheaten_terrier | 6 |
| Saint_Bernard               | 6 |
| clumber                     | 6 |
| Australian_terrier          | 6 |
| white_wolf                  | 6 |
| Border_terrier              | 5 |
| muzzle                      | 5 |
| Ibizan_hound                | 5 |
| Italian_greyhound           | 5 |
| curly-coated_retriever      | 5 |
| redbone                     | 5 |
| Newfoundland                | 5 |
| EntleBucher                 | 5 |
| Irish_setter                | 5 |
| Shih-Tzu                    | 5 |
| basset                      | 5 |
| Leonberg                    | 5 |
| teddy                       | 5 |
| English_springer            | 4 |
| tennis_ball                 | 4 |
| Yorkshire_terrier           | 4 |
| Lhasa                       | 4 |
| Norwich_terrier             | 4 |
| schipperke                  | 4 |
| bath_towel                  | 4 |
| Japanese_spaniel            | 4 |
| Airedale                    | 4 |
| miniature_schnauzer         | 3 |
| cairn                       | 3 |
| hog                         | 3 |
| otterhound                  | 3 |
| gibbon                      | 3 |
| German_short-haired_pointer | 3 |
| sandbar                     | 3 |
| Gordon_setter               | 3 |
| black-footed_ferret         | 3 |

|                            |   |
|----------------------------|---|
| Old_English_sheepdog       | 3 |
| flat-coated_retriever      | 2 |
| three-toed_sloth           | 2 |
| sunglasses                 | 2 |
| dalmatian                  | 2 |
| polecat                    | 2 |
| silky_terrier              | 2 |
| hippopotamus               | 2 |
| malinois                   | 2 |
| koala                      | 2 |
| wallaby                    | 2 |
| wire-haired_fox_terrier    | 2 |
| Dandie_Dinmont             | 2 |
| Irish_water_spaniel        | 2 |
| guinea_pig                 | 2 |
| Greater_Swiss_Mountain_dog | 2 |
| Blenheim_spaniel           | 2 |
| sombrero                   | 2 |
| ice_bear                   | 2 |
| cougar                     | 2 |
| ski_mask                   | 2 |
| Angora                     | 2 |
| bathtub                    | 2 |
| mousetrap                  | 2 |
| shower_curtain             | 2 |
| ice_lolly                  | 2 |
| groenendael                | 2 |
| weasel                     | 2 |
| quilt                      | 2 |
| bathing_cap                | 2 |
| bluetick                   | 2 |
| echidna                    | 2 |
| Name: p3, dtype: int64     |   |

```
In [173]: #quality 8
p_remove = ['seat_belt',
            'swing',
            'car_mirror',
            'web_site',
            'bath_towel',
            'llama',
            'porcupine',
            'doormat',
            'wombat',
            'muzzle',
            'hamster',
            'tub',
            'merekat',
```

'acorn\_squash',  
'jigsaw\_puzzle',  
'guinea\_pig',  
'barrow',  
'cairn',  
'badger',  
'brown\_bear',  
'vacuum',  
'Angora',  
'sea\_lion',  
'hog',  
'refrigerator',  
'ox',  
"jack-o'-lantern",  
'weasel',  
'ski\_mask',  
'feather\_boa',  
'koala',  
'sunglasses',  
'skunk',  
'ram',  
'Christmas\_stocking',  
'pillow',  
'paddle',  
'beaver',  
'tennis\_ball',  
'swing',  
'shopping\_cart',  
'bath\_towel',  
'ice\_bear',  
'car\_mirror',  
'porcupine',  
'web\_site',  
'llama',  
'Newfoundland',  
'wombat',  
'muzzle',  
'tub',  
'white\_wolf',  
'doormat',  
'brown\_bear',  
'ox',  
'bluetick',  
'hamster',  
'jigsaw\_puzzle',  
'barrow',  
'refrigerator',  
'sea\_lion',



```

'vacuum',
'meerkat',
'sky_mask',
"jack-o'-lantern",
'goose',
'hog',
'Arctic_fox',
'weasel',
'badger',
'acord_squash',
'guinea_pig',
'snorkel',
'sorrel',
'bubble',
'toilet_seat',
'Christmas_stocking',
'gibbon',
'paddle',
'hen',
'koala',
'carton',
'beaver',
'feather_boa',
'swab',
'three-toed_sloth',
'shower_curtain',
'space_heater',
'menu',
'polecat',
'mousetrap',
'dhole',
'ice_lolly',
'shopping_basket',
'bathing_cap',
'Persian_cat']

```

```
In [174]: # quality 8
```

```

df = df[~df.p1.isin(p_remove)]
df = df[~df.p2.isin(p_remove)]
df = df[~df.p3.isin(p_remove)]

```

```
In [175]: # quality 9
```

```
df = df[df.rating_denominator == 10]
```

```
In [176]: # tidiness 1
```

```

df = df.drop(columns = ['entities',
                        'extended_entities',
                        'user'])

```

```

In [177]: # tidiness 2
          df_copy = df.copy()

In [178]: # tidiness 2
          df_copy = pd.melt(df_copy,
                           id_vars = ['tweet_id',
                                      'text',
                                      'expanded_urls',
                                      'rating_numerator',
                                      'rating_denominator',
                                      'name',
                                      'created_at',
                                      'favorite_count',
                                      'retweet_count',
                                      'jpg_url',
                                      'p1',
                                      'p1_conf',
                                      'p1_dog',
                                      'p2',
                                      'p2_conf',
                                      'p2_dog',
                                      'p3',
                                      'p3_conf',
                                      'p3_dog'],
                           value_vars = ['doggo', 'floofer', 'pupper', 'puppo'])

```

```

In [179]: # tidiness 2
          len(df_copy[df_copy.value != 'None'])

```

```

Out[179]: 117

```

```

In [180]: # tidiness 2
          df = df.drop(columns = ['doggo', 'floofer', 'pupper', 'puppo'])

```

Since filtering by those that have dog-tionary values would result in a dataset that is significantly reduced, I've decided to remove the dog-tionary columns entirely.

```

In [181]: # save clean as master
          df.to_csv('twitter_archive_master.csv', index = False)

```

```

In [182]: # load clean
          df_clean = pd.read_csv('twitter_archive_master.csv')

```

```

In [209]: # insight 1
          df_clean.name.value_counts()

```

```

Out[209]: Cooper      8
          Oliver      7
          Charlie     7

```

|           |   |
|-----------|---|
| Tucker    | 6 |
| Koda      | 6 |
| Winston   | 5 |
| Bo        | 5 |
| Sadie     | 5 |
| Leo       | 5 |
| Penny     | 5 |
| the       | 5 |
| Toby      | 5 |
| Lucy      | 5 |
| Rusty     | 4 |
| Maggie    | 4 |
| Dave      | 4 |
| Scooter   | 4 |
| Lola      | 4 |
| Cassie    | 4 |
| Larry     | 4 |
| Bear      | 4 |
| Gus       | 4 |
| Daisy     | 4 |
| Oscar     | 4 |
| Jax       | 4 |
| Finn      | 4 |
| Scout     | 3 |
| Brody     | 3 |
| Winnie    | 3 |
| Bella     | 3 |
| Chester   | 3 |
| Wilson    | 3 |
| Reggie    | 3 |
| Ellie     | 3 |
| Dexter    | 3 |
| Sophie    | 3 |
| Olive     | 3 |
| Max       | 3 |
| Zeke      | 3 |
| Duke      | 3 |
| Beau      | 3 |
| Louis     | 3 |
| Reese     | 3 |
| Rosie     | 3 |
| Stanley   | 3 |
| Sebastian | 3 |
| Jack      | 3 |
| getting   | 2 |
| Lou       | 2 |
| Coops     | 2 |
| Bob       | 2 |

|           |   |
|-----------|---|
| Herald    | 2 |
| Remington | 2 |
| Theodore  | 2 |
| Nelly     | 2 |
| Gizmo     | 2 |
| Griffin   | 2 |
| Romeo     | 2 |
| Boomer    | 2 |
| Peaches   | 2 |
| Gabe      | 2 |
| Moe       | 2 |
| Terry     | 2 |
| Luca      | 2 |
| Frank     | 2 |
| Calvin    | 2 |
| Flávio    | 2 |
| Axel      | 2 |
| Oakley    | 2 |
| Nala      | 2 |
| Clark     | 2 |
| Buddy     | 2 |
| Trooper   | 2 |
| Milo      | 2 |
| Kreggory  | 2 |
| Sunny     | 2 |
| Archie    | 2 |
| Watson    | 2 |
| Hobbes    | 2 |
| Franklin  | 2 |
| Olivia    | 2 |
| one       | 2 |
| Atlas     | 2 |
| Sammy     | 2 |
| Louie     | 2 |
| Rufus     | 2 |
| Wally     | 2 |
| Moose     | 2 |
| Jeffrey   | 2 |
| Wallace   | 2 |
| Tyr       | 2 |
| Solomon   | 2 |
| Lorenzo   | 2 |
| Dash      | 2 |
| Paisley   | 2 |
| Bruce     | 2 |
| Roosevelt | 2 |
| Jimothy   | 2 |
| Bisquick  | 2 |

|            |   |
|------------|---|
| Juno       | 2 |
| Finley     | 2 |
| very       | 2 |
| Lily       | 2 |
| just       | 2 |
| Alice      | 2 |
| Churlie    | 2 |
| Maximus    | 2 |
| Bentley    | 2 |
| Coco       | 2 |
| Zoey       | 2 |
| Crystal    | 2 |
| Rocky      | 2 |
| Frankie    | 2 |
| Kilo       | 2 |
| Earl       | 2 |
| Thumas     | 2 |
| Sarge      | 2 |
| Panda      | 2 |
| George     | 2 |
| Chuckles   | 2 |
| Reginald   | 2 |
| Phil       | 2 |
| Cupcake    | 2 |
| Bubbles    | 2 |
| Mister     | 2 |
| Carl       | 2 |
| Link       | 1 |
| Ridley     | 1 |
| my         | 1 |
| Dotsy      | 1 |
| Grizzie    | 1 |
| Fiona      | 1 |
| Acro       | 1 |
| Gustaf     | 1 |
| Clarq      | 1 |
| Odin       | 1 |
| Oreo       | 1 |
| Lassie     | 1 |
| Maisey     | 1 |
| Colin      | 1 |
| Hurley     | 1 |
| Lugan      | 1 |
| Willy      | 1 |
| Marley     | 1 |
| officially | 1 |
| Suki       | 1 |
| Walker     | 1 |

|              |   |
|--------------|---|
| Ash          | 1 |
| BeBe         | 1 |
| Cleopatra    | 1 |
| Craig        | 1 |
| Furzey       | 1 |
| Claude       | 1 |
| Mimosa       | 1 |
| Striker      | 1 |
| Geno         | 1 |
| Grady        | 1 |
| Socks        | 1 |
| Naphaniel    | 1 |
| Iroh         | 1 |
| Shooter      | 1 |
| Curtis       | 1 |
| Emmy         | 1 |
| Gunner       | 1 |
| Carper       | 1 |
| Poppy        | 1 |
| Ruffles      | 1 |
| Michelangelo | 1 |
| Rumble       | 1 |
| Dex          | 1 |
| Kenneth      | 1 |
| Kuyu         | 1 |
| Albert       | 1 |
| Kayla        | 1 |
| Bookstore    | 1 |
| Oshie        | 1 |
| Brian        | 1 |
| Brandi       | 1 |
| Rueben       | 1 |
| Jarod        | 1 |
| Flash        | 1 |
| Fizz         | 1 |
| Rose         | 1 |
| Stephan      | 1 |
| Keet         | 1 |
| Loki         | 1 |
| Aiden        | 1 |
| Alexander    | 1 |
| Millie       | 1 |
| Brat         | 1 |
| Sage         | 1 |
| Tove         | 1 |
| Terrenth     | 1 |
| Tripp        | 1 |
| Tilly        | 1 |

|             |   |
|-------------|---|
| Jay         | 1 |
| Diogi       | 1 |
| Carly       | 1 |
| Swagger     | 1 |
| Fwed        | 1 |
| Deacon      | 1 |
| Kulet       | 1 |
| Betty       | 1 |
| Barney      | 1 |
| Indie       | 1 |
| Raymond     | 1 |
| Pablo       | 1 |
| Clybe       | 1 |
| Rilo        | 1 |
| quite       | 1 |
| Fillup      | 1 |
| Hall        | 1 |
| Hubertson   | 1 |
| Adele       | 1 |
| an          | 1 |
| Zoe         | 1 |
| Sprout      | 1 |
| Katie       | 1 |
| Rizzy       | 1 |
| Pawnd       | 1 |
| Griswold    | 1 |
| Kyro        | 1 |
| Cal         | 1 |
| Brandy      | 1 |
| Lance       | 1 |
| Emma        | 1 |
| Kanu        | 1 |
| Bubba       | 1 |
| infuriating | 1 |
| Ronduh      | 1 |
| Lili        | 1 |
| Superpup    | 1 |
| Harnold     | 1 |
| Leela       | 1 |
| Bloo        | 1 |
| Karma       | 1 |
| Bailey      | 1 |
| light       | 1 |
| Luther      | 1 |
| Evy         | 1 |
| Jerome      | 1 |
| Linda       | 1 |
| Robin       | 1 |

|            |   |
|------------|---|
| Chip       | 1 |
| Tedders    | 1 |
| Jesse      | 1 |
| Pavlov     | 1 |
| Binky      | 1 |
| Biden      | 1 |
| Beemo      | 1 |
| Levi       | 1 |
| Miley      | 1 |
| Gerbald    | 1 |
| Ole        | 1 |
| Canela     | 1 |
| Doc        | 1 |
| Willie     | 1 |
| Berb       | 1 |
| Davey      | 1 |
| Nimbus     | 1 |
| Joshwa     | 1 |
| Pipsy      | 1 |
| Wishes     | 1 |
| Apollo     | 1 |
| Mairi      | 1 |
| Maxaroni   | 1 |
| Brutus     | 1 |
| Kreg       | 1 |
| Monster    | 1 |
| Kara       | 1 |
| Akumi      | 1 |
| Mutt       | 1 |
| Django     | 1 |
| Lucky      | 1 |
| Mike       | 1 |
| Siba       | 1 |
| Andy       | 1 |
| Marq       | 1 |
| Baron      | 1 |
| Kenny      | 1 |
| Pumpkin    | 1 |
| Rover      | 1 |
| Tyrus      | 1 |
| Jimison    | 1 |
| Amber      | 1 |
| Leonidas   | 1 |
| Kevon      | 1 |
| Ito        | 1 |
| Skittles   | 1 |
| Longfellow | 1 |
| Ralf       | 1 |



|           |   |
|-----------|---|
| Snicku    | 1 |
| Fynn      | 1 |
| Clarkus   | 1 |
| Willow    | 1 |
| Buckley   | 1 |
| Zooey     | 1 |
| Jackson   | 1 |
| Maddie    | 1 |
| Jebberson | 1 |
| Julio     | 1 |
| Marvin    | 1 |
| Bronte    | 1 |
| Sprinkles | 1 |
| Scruffers | 1 |
| Baxter    | 1 |
| Loomis    | 1 |
| Bobbay    | 1 |
| Gert      | 1 |
| Dale      | 1 |
| Taco      | 1 |
| Banjo     | 1 |
| Chadrick  | 1 |
| Liam      | 1 |
| Ulysses   | 1 |
| Nigel     | 1 |
| Shelby    | 1 |
| Hercules  | 1 |
| Bloop     | 1 |
| Alf       | 1 |
| Charleson | 1 |
| Vincent   | 1 |
| Petrick   | 1 |
| Dewey     | 1 |
| Olaf      | 1 |
| Bernie    | 1 |
| Meatball  | 1 |
| Pepper    | 1 |
| Jockson   | 1 |
| Sierra    | 1 |
| Laela     | 1 |
| Duchess   | 1 |
| DonDon    | 1 |
| Kendall   | 1 |
| Jeph      | 1 |
| Dudley    | 1 |
| Beebop    | 1 |
| Stormy    | 1 |
| Jim       | 1 |

|            |   |
|------------|---|
| Meyer      | 1 |
| Dug        | 1 |
| Clarence   | 1 |
| Brudge     | 1 |
| Timofy     | 1 |
| Doug       | 1 |
| Calbert    | 1 |
| Zeek       | 1 |
| Travis     | 1 |
| Buddah     | 1 |
| Chef       | 1 |
| Pancake    | 1 |
| Billl      | 1 |
| Cheesy     | 1 |
| Bauer      | 1 |
| O          | 1 |
| Terrance   | 1 |
| Carbon     | 1 |
| Corey      | 1 |
| Bradley    | 1 |
| Rhino      | 1 |
| Dylan      | 1 |
| Jackie     | 1 |
| Sephie     | 1 |
| Bobb       | 1 |
| Samson     | 1 |
| Mia        | 1 |
| Trip       | 1 |
| Mabel      | 1 |
| Jessifer   | 1 |
| Brownie    | 1 |
| Hank       | 1 |
| Spark      | 1 |
| Puff       | 1 |
| Chelsea    | 1 |
| incredibly | 1 |
| Andru      | 1 |
| Kota       | 1 |
| Rory       | 1 |
| Ralphé     | 1 |
| Coopson    | 1 |
| Dallas     | 1 |
| Blitz      | 1 |
| Colby      | 1 |
| Cupid      | 1 |
| Steve      | 1 |
| Gary       | 1 |
| Tuco       | 1 |

|             |   |
|-------------|---|
| Autumn      | 1 |
| Jonah       | 1 |
| Orion       | 1 |
| Jamesy      | 1 |
| Shakespeare | 1 |
| Tobi        | 1 |
| Bell        | 1 |
| Huxley      | 1 |
| Kaiya       | 1 |
| Nugget      | 1 |
| Shadow      | 1 |
| Roscoe      | 1 |
| Enchilada   | 1 |
| Paull       | 1 |
| Kawhi       | 1 |
| Layla       | 1 |
| Neptune     | 1 |
| Dot         | 1 |
| Lillie      | 1 |
| Jazzy       | 1 |
| Pubert      | 1 |
| Tebow       | 1 |
| Crouton     | 1 |
| Monty       | 1 |
| Glacier     | 1 |
| Halo        | 1 |
| Major       | 1 |
| Gustav      | 1 |
| Benji       | 1 |
| Remy        | 1 |
| Brandonald  | 1 |
| Dobby       | 1 |
| Arlen       | 1 |
| Shikha      | 1 |
| Blakely     | 1 |
| Yogi        | 1 |
| Wesley      | 1 |
| Mattie      | 1 |
| Durg        | 1 |
| Stuart      | 1 |
| Zeus        | 1 |
| Marlee      | 1 |
| Vinscent    | 1 |
| Banditt     | 1 |
| Covach      | 1 |
| Boston      | 1 |
| Newt        | 1 |
| Donny       | 1 |

|            |   |
|------------|---|
| Jazz       | 1 |
| Kial       | 1 |
| Piper      | 1 |
| Jameson    | 1 |
| Boots      | 1 |
| Aubie      | 1 |
| Dido       | 1 |
| Comet      | 1 |
| Billy      | 1 |
| Stella     | 1 |
| Rufio      | 1 |
| Pippin     | 1 |
| Sugar      | 1 |
| Callie     | 1 |
| Snoopy     | 1 |
| Arya       | 1 |
| Thor       | 1 |
| Creg       | 1 |
| Staniel    | 1 |
| Alfie      | 1 |
| Klein      | 1 |
| Venti      | 1 |
| Ben        | 1 |
| Crawford   | 1 |
| Oliviér    | 1 |
| Gòrdón     | 1 |
| Kollin     | 1 |
| Rambo      | 1 |
| Harlso     | 1 |
| Rizzo      | 1 |
| Mauve      | 1 |
| Kyle       | 1 |
| Lorelei    | 1 |
| actually   | 1 |
| Ralphie    | 1 |
| Chaz       | 1 |
| Christoper | 1 |
| Trigger    | 1 |
| Grey       | 1 |
| Atticus    | 1 |
| Aspen      | 1 |
| Tayzie     | 1 |
| Sandra     | 1 |
| Titan      | 1 |
| Goose      | 1 |
| Walter     | 1 |
| Tug        | 1 |
| Spanky     | 1 |

|           |   |
|-----------|---|
| Franq     | 1 |
| Reagan    | 1 |
| Augie     | 1 |
| Joey      | 1 |
| Dook      | 1 |
| Jerry     | 1 |
| Sojourner | 1 |
| Rooney    | 1 |
| Abby      | 1 |
| Kevin     | 1 |
| Penelope  | 1 |
| Rodney    | 1 |
| Monkey    | 1 |
| Brady     | 1 |
| Samsom    | 1 |
| Kramer    | 1 |
| Quinn     | 1 |
| Perry     | 1 |
| Sweet     | 1 |
| Sobe      | 1 |
| Jo        | 1 |
| Richie    | 1 |
| Einstein  | 1 |
| Smokey    | 1 |
| Derek     | 1 |
| Strider   | 1 |
| Holly     | 1 |
| Glenn     | 1 |
| Tater     | 1 |
| Belle     | 1 |
| Dawn      | 1 |
| Tonks     | 1 |
| Livvie    | 1 |
| Horace    | 1 |
| Hunter    | 1 |
| Rupert    | 1 |
| Crimson   | 1 |
| Divine    | 1 |
| Bobble    | 1 |
| Eriq      | 1 |
| Aldrick   | 1 |
| Mingus    | 1 |
| Pupcasso  | 1 |
| Sparky    | 1 |
| Nico      | 1 |
| Arlo      | 1 |
| Gilbert   | 1 |
| Tycho     | 1 |

|           |   |
|-----------|---|
| Mona      | 1 |
| Pippa     | 1 |
| Erik      | 1 |
| Cecil     | 1 |
| Ralphus   | 1 |
| Timison   | 1 |
| Rolf      | 1 |
| Fred      | 1 |
| Raphael   | 1 |
| Tuck      | 1 |
| Sundance  | 1 |
| Cash      | 1 |
| Strudel   | 1 |
| Willem    | 1 |
| Kirk      | 1 |
| Phred     | 1 |
| Finnegus  | 1 |
| Jarvis    | 1 |
| Jeb       | 1 |
| Heinrich  | 1 |
| Waffles   | 1 |
| Tiger     | 1 |
| Ziva      | 1 |
| Eve       | 1 |
| Ronnie    | 1 |
| Timber    | 1 |
| Frönq     | 1 |
| Tyrone    | 1 |
| Ozzy      | 1 |
| Doobert   | 1 |
| JD        | 1 |
| Hector    | 1 |
| Birf      | 1 |
| Yoda      | 1 |
| Schnitzel | 1 |
| Aqua      | 1 |
| Chloe     | 1 |
| Cermet    | 1 |
| Harold    | 1 |
| Dante     | 1 |
| Godzilla  | 1 |
| Saydee    | 1 |
| Rontu     | 1 |
| Ebby      | 1 |
| Ollie     | 1 |
| Sky       | 1 |
| Eevee     | 1 |
| Humphrey  | 1 |

|           |   |
|-----------|---|
| Riley     | 1 |
| Chase     | 1 |
| Lambeau   | 1 |
| Benny     | 1 |
| Noah      | 1 |
| Aja       | 1 |
| Harper    | 1 |
| Lennon    | 1 |
| Kloey     | 1 |
| Harvey    | 1 |
| Mason     | 1 |
| Dunkin    | 1 |
| Bonaparte | 1 |
| Opal      | 1 |
| Mya       | 1 |
| Vixen     | 1 |
| Duddles   | 1 |
| Bradlay   | 1 |
| Tino      | 1 |
| Kona      | 1 |
| Anna      | 1 |
| Chevy     | 1 |
| Ginger    | 1 |
| Stark     | 1 |
| Ted       | 1 |
| Gerald    | 1 |
| Benedict  | 1 |
| Karll     | 1 |
| Alfy      | 1 |
| Dutch     | 1 |
| Angel     | 1 |
| Pluto     | 1 |
| Timmy     | 1 |
| Toffee    | 1 |
| Bodie     | 1 |
| Mac       | 1 |
| Cody      | 1 |
| Ruby      | 1 |
| Pilot     | 1 |
| Pickles   | 1 |
| Jed       | 1 |
| Taz       | 1 |
| Eugene    | 1 |
| Kirby     | 1 |
| Chubbs    | 1 |
| Ron       | 1 |
| Jeremy    | 1 |
| Rorie     | 1 |

```

Shawwn      1
Lulu        1
Winifred    1
Miguel      1
Molly       1
Schnozz     1
Genevieve   1
Lupe        1
Cilantro    1
Rinna       1
Gordon      1
Flurpson    1
Sora        1
Shadoe      1
Gromit      1
Cora        1
Name: name, dtype: int64

```

### Insight 1

What is the most common dog name of the dataset? What names make up the top 5?

Cooper is the most common dog name with 8 entries. The top 5 is as follows name (count): Cooper (8), Oliver (7), Charlie (7), Tucker (6), Koda (6).

```

In [184]: # insight 2
          df_clean.rating_numerator.describe()

```

```

Out[184]: count      864.000000
          mean       10.968750
          std        1.613298
          min        2.000000
          25%       10.000000
          50%       11.000000
          75%       12.000000
          max       14.000000
          Name: rating_numerator, dtype: float64

```

### Insight 2

What is the average rating? What about the maximum? What about the minimum?

The average rating is 10.97 out of 10. The maximum is 15. The minimum is 2.

```

In [185]: # insight 3
          df_clean['total_interactions'] = df_clean['favorite_count'] + df_clean['retweet_count']

In [186]: # insight 3
          print(df_clean[df_clean.total_interactions == df_clean.total_interactions.max()].total_interactions)
          print(df_clean[df_clean.favorite_count == df_clean.favorite_count.max()].retweet_count)
          print(df_clean[df_clean.retweet_count == df_clean.retweet_count.max()].favorite_count)
          print(df_clean[df_clean.total_interactions == df_clean.total_interactions.max()].name)
          print(df_clean[df_clean.total_interactions == df_clean.total_interactions.max()].rating)

```



```

221    173800
Name: total_interactions, dtype: int64
221    55441
Name: retweet_count, dtype: int64
221    118359
Name: favorite_count, dtype: int64
221    Stephan
Name: name, dtype: object
221     13
Name: rating_numerator, dtype: int64

```

### Insight 3

What dog or dogs had the most total interactions (retweets + favorites)? What about just retweets? What about just favorites?

The most PUP-ular dog across all three metrics was...Stephan! Stephan had the most interactions, most retweets, and most favorites. Stephan was rated a 13/10!

```

In [187]: # visualization 1
          df_clean.rating_numerator.value_counts()

```

```

Out[187]: 12    229
          11    202
          10    170
          13    124
           9     64
           8     41
          14     11
           7     11
           6      6
           5      3
           4      1
           3      1
           2      1
          Name: rating_numerator, dtype: int64

```

```

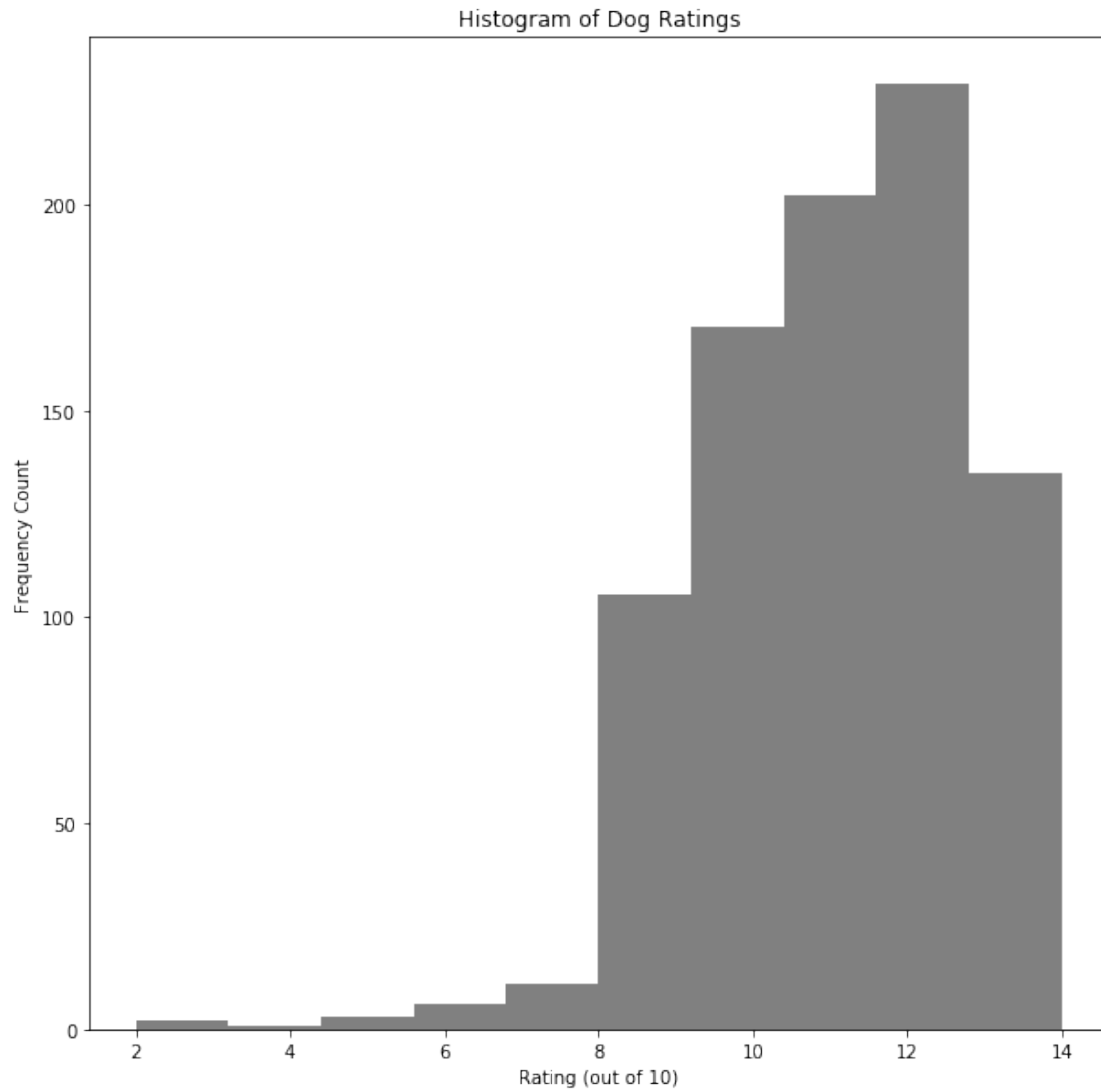
In [207]: # visualization 1
          v1 = df_clean.rating_numerator.plot.hist(color = 'grey', figsize = (10, 10))
          v1.set_xlabel('Rating (out of 10)')
          v1.set_ylabel('Frequency Count')
          v1.set_title('Histogram of Dog Ratings')

```

```

Out[207]: Text(0.5,1,'Histogram of Dog Ratings')

```



### Visualization 1

Graph the frequency of each dog rating.

Based on the histogram above, the most frequent dog rating is 12. Additionally, dogs are frequently rated over 10, as they should be.