GATHERING DATA

In [1]:

```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
%matplotlib inline
import seaborn as sns
sns.set_style('darkgrid')
import requests
import os
# from bs4 import BeautifulSoup
import json
from sqlalchemy import create_engine
import re
```

In [2]:

```
twitter_archive_enhanced = pd.read_csv('twitter-archive-enhanced.csv')
```

In [3]:

```
url = " https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-predictions
respons = requests.get(url)

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

In [4]:

```
url = 'https://video.udacity-data.com/topher/2018/November/5be5fb7d_tweet-json/tweet-json.t
respons = requests.get(url)

with open('tweet_json.txt', 'wb') as file:
    file.write(respons.content)
```

In [5]:

```
with open('tweet_json.txt', 'r') as f:
    print(json.loads(f.readline()))
```


```
{'created_at': 'Tue Aug 01 16:23:56 +0000 2017', 'id': 892420643555336193,
'id_str': '892420643555336193', 'full_text': "This is Phineas. He's a myst
ical boy. Only ever appears in the hole of a donut. 13/10 https://t.co/MgU
WQ76dJU", (https://t.co/MgUWQ76dJU",) 'truncated': False, 'display_text_ra
nge': [0, 85], 'entities': {'hashtags': [], 'symbols': [], 'user_mention
s': [], 'urls': [], 'media': [{'id': 892420639486877696, 'id_str': '892420
639486877696', 'indices': [86, 109], 'media_url': 'http://pbs.twimg.com/me
dia/DGKD1-bXoAAIAUK.jpg', 'media_url_https': 'https://pbs.twimg.com/media/
DGKD1-bXoAAIAUK.jpg', 'url': 'https://t.co/MgUWQ76dJU', 'display_url': 'pi
c.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, 'res
ize': 'crop'}, 'small': {'w': 540, 'h': 528, 'resize': 'fit'}, 'medium':
 {'w': 540, 'h': 528, 'resize': 'fit'}}}]}, 'extended_entities': {'media':
[{'id': 892420639486877696, 'id_str': '892420639486877696', 'indices': [8
6, 109], 'media_url': 'http://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg', 'm
edia_url_https': 'https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg', 'url':
'https://t.co/MgUWQ76dJU', 'display_url': 'pic.twitter.com/MgUWQ76dJU', 'e
xpanded_url': 'https://twitter.com/dog_rates/status/892420643555336193/pho
```


In [6]:

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

In [7]:

```
image_preidiction
```

Out[7]:

	tweet_id	jpg_url	img_num	
0	666020888022790149	https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg	1	Welsh_sp
1	666029285002620928	https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg	1	
2	666033412701032449	https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg	1	Ger
3	666044226329800704	https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg	1	Rhodes
4	666049248165822465	https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg	1	mini
...	...	...	...	
2070	891327558926688256	https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg	2	
2071	891689557279858688	https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg	1	
2072	891815181378084864	https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg	1	
2073	892177421306343426	https://pbs.twimg.com/media/DGGmoV4XsAAUL6n.jpg	1	
2074	892420643555336193	https://pbs.twimg.com/media/DGKD1-bXoAAIAUK.jpg	1	

2075 rows × 12 columns

In [8]:

```
df_list = []
json_errors = []

with open('tweet_json.txt', 'r') as f:

    for x in f:
        try:
            timestampe = json.loads(x)['created_at']
            tweet_id = json.loads(x)['id']
            tweet_text = json.loads(x)['full_text']
            tweet_image_url = json.loads(x)['extended_entities']['media'][0]['expanded_url'
            source = json.loads(x)['source']
            retweet_count = json.loads(x)['retweet_count']
            favorite_count = json.loads(x)['favorite_count']
            follwers_count = json.loads(x)['user']['followers_count']

            dict = {
                'timestampe': timestampe,
                'tweet_id': tweet_id,
                'tweet_text': tweet_text,
                'tweet_image_url': tweet_image_url,
                'source': source,
                'retweet_count': retweet_count,
                'favorite_count': favorite_count,
                'follwers_count': follwers_count
            }

            df_list.append(dict)

        except:
            #json_errors.append(json.loads(x))
            timestampe = json.loads(x)['created_at']
            tweet_id = json.loads(x)['id']
            tweet_text = json.loads(x)['full_text']
            tweet_image_url = np.nan
            source = json.loads(x)['source']
            retweet_count = json.loads(x)['retweet_count']
            favorite_count = json.loads(x)['favorite_count']
            follwers_count = json.loads(x)['user']['followers_count']

            dict = {
                'timestampe': timestampe,
                'tweet_id': tweet_id,
                'tweet_text': tweet_text,
                'tweet_image_url': tweet_image_url,
                'source': source,
                'retweet_count': retweet_count,
                'favorite_count': favorite_count,
                'follwers_count': follwers_count
            }

            df_list.append(dict)
```

In [9]:

```
# for x in json_errors:

#     timestampe = x['created_at']
#     tweet_id = x['id']
#     tweet_text = x['full_text']
#     tweet_image_url = 'NAN'
#     source = x['source']
#     retweet_count = x['retweet_count']
#     favorite_count = x['favorite_count']
#     follwers_count = x['user']['followers_count']

#     dict = {
#                 'timestampe': timestampe,
#                 'tweet_id': tweet_id,
#                 'tweet_text': tweet_text,
#                 'tweet_image_url': tweet_image_url,
#                 'source': source,
#                 'retweet_count': retweet_count,
#                 'favorite_count': favorite_count,
#                 'follwers_count': follwers_count
#             }

#     df_list.append(dict)
```

In [10]:

```
len(df_list)
```

Out[10]:

```
2354
```

In [11]:

```
weRateDog_df = pd.DataFrame(df_list, columns=['timestampe', 'tweet_id', 'tweet_text', 'twee
                                    'favorite_count', 'follwers_count'])
```

In [12]:

```
weRateDog_df.head()
```

Out[12]:

	timestampe	tweet_id	tweet_text	tweet_image_url	
0	Tue Aug 01 16:23:56 +0000 2017	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	hr
1	Tue Aug 01 00:17:27 +0000 2017	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	hr
2	Mon Jul 31 00:18:03 +0000 2017	891815181378084864	This is Archie. He is a rare Norwegian Pouncin...	https://twitter.com/dog_rates/status/891815181...	hr
3	Sun Jul 30 15:58:51 +0000 2017	891689557279858688	This is Darla. She commenced a snooze mid meal...	https://twitter.com/dog_rates/status/891689557...	hr
4	Sat Jul 29 16:00:24 +0000 2017	891327558926688256	This is Franklin. He would like you to stop ca...	https://twitter.com/dog_rates/status/891327558...	hr

In [13]:

```
weRateDog_df.to_csv('WeRateDog.csv', index=False)
```

Access

In [14]:

```
weRateDog_df
```

Out[14]:

	timestampe	tweet_id	tweet_text	tweet_image_url
0	Tue Aug 01 16:23:56 +0000 2017	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...
1	Tue Aug 01 00:17:27 +0000 2017	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...
2	Mon Jul 31 00:18:03 +0000 2017	891815181378084864	This is Archie. He is a rare Norwegian Pouncin...	https://twitter.com/dog_rates/status/891815181...
3	Sun Jul 30 15:58:51 +0000 2017	891689557279858688	This is Darla. She commenced a snooze mid meal...	https://twitter.com/dog_rates/status/891689557...
4	Sat Jul 29 16:00:24 +0000 2017	891327558926688256	This is Franklin. He would like you to stop ca...	https://twitter.com/dog_rates/status/891327558...
...	...	...	...	...
2349	Mon Nov 16 00:24:50 +0000 2015	666049248165822465	Here we have a 1949 1st generation vulpix. Enj...	https://twitter.com/dog_rates/status/666049248...
2350	Mon Nov 16 00:04:52 +0000 2015	666044226329800704	This is a purebred Piers Morgan. Loves to Netf...	https://twitter.com/dog_rates/status/666044226...
2351	Sun Nov 15 23:21:54 +0000 2015	666033412701032449	Here is a very happy pup. Big fan of well-main...	https://twitter.com/dog_rates/status/666033412...
2352	Sun Nov 15 23:05:30 +0000 2015	666029285002620928	This is a western brown Mitsubishi terrier. Up...	https://twitter.com/dog_rates/status/666029285...
2353	Sun Nov 15 22:32:08 +0000 2015	666020888022790149	Here we have a Japanese Irish Setter. Lost eye...	https://twitter.com/dog_rates/status/666020888...

2354 rows × 8 columns

In [15]:

```
weRateDog_df.tweet_text
```

Out[15]:

```
0       This is Phineas. He's a mystical boy. Only eve...
1       This is Tilly. She's just checking pup on you....
2       This is Archie. He is a rare Norwegian Pouncin...
3       This is Darla. She commenced a snooze mid meal...
4       This is Franklin. He would like you to stop ca...
                              ...
2349    Here we have a 1949 1st generation vulpix. Enj...
2350    This is a purebred Piers Morgan. Loves to Netf...
2351    Here is a very happy pup. Big fan of well-main...
2352    This is a western brown Mitsubishi terrier. Up...
2353    Here we have a Japanese Irish Setter. Lost eye...
Name: tweet_text, Length: 2354, dtype: object
```

In [16]:

```
weRateDog_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2354 entries, 0 to 2353
Data columns (total 8 columns):
 #   Column           Non-Null Count  Dtype 
---  ------           --------------  ----- 
 0   timestampe       2354 non-null   object
 1   tweet_id         2354 non-null   int64 
 2   tweet_text       2354 non-null   object
 3   tweet_image_url  2073 non-null   object
 4   source           2354 non-null   object
 5   retweet_count    2354 non-null   int64 
 6   favorite_count   2354 non-null   int64 
 7   follwers_count   2354 non-null   int64 
dtypes: int64(4), object(4)
memory usage: 147.2+ KB
```

In [17]:

```
weRateDog_df.source.head()
```

Out[17]:

```
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...
Name: source, dtype: object
```

In [18]:

```
twitter_archive_enhanced.head()
```

Out[18]:

	tweet_id	in_reply_to_status_id	in_reply_to_user_id	timestamp	
0	892420643555336193	NaN	NaN	2017-08-01 16:23:56 +0000	href="http://twitte
1	892177421306343426	NaN	NaN	2017-08-01 00:17:27 +0000	href="http://twitte
2	891815181378084864	NaN	NaN	2017-07-31 00:18:03 +0000	href="http://twitte
3	891689557279858688	NaN	NaN	2017-07-30 15:58:51 +0000	href="http://twitte
4	891327558926688256	NaN	NaN	2017-07-29 16:00:24 +0000	href="http://twitte

In [19]:

```
twitter_archive_enhanced.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
```

In [20]:

```
image_preidiction
```

Out[20]:

	tweet_id	jpg_url	img_num	p1
0	666020888022790149	https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg	1	Welsh_springer_spaniel
1	666029285002620928	https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg	1	redbone
2	666033412701032449	https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg	1	German_shepherd
3	666044226329800704	https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg	1	Rhodesian_ridgeback
4	666049248165822465	https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg	1	miniature_pinscher
...	...	...	...	...
2070	891327558926688256	https://pbs.twimg.com/media/DF6hr6BUMAAzZgT.jpg	2	basset
2071	891689557279858688	https://pbs.twimg.com/media/DF_q7IAWsAEuuN8.jpg	1	paper_towel
2072	891815181378084864	https://pbs.twimg.com/media/DGBdLU1WsAANxJ9.jpg	1	Chihuahua

In [21]:

```
image_preidiction.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
```

In [22]:

```
weRateDog_df_copy = weRateDog_df.copy()
image_preidiction_copy = image_preidiction.copy()
twitter_archive_enhanced_copy = twitter_archive_enhanced.copy()
```

Quality Issues

weRateDog_df Data Frame

- invalid time format for timestamp column
- time tweeted in time stamp
- day of the week in timestampe
- ratting of dogs in tweet text
- extra URL links for images in text
- dog stage in tweet text
- invalid format for source column
- inaccurate timestampe columns data type
- inaccurate dog rating data type

twitter_archive_enhanced Data Frame

- invalid format for source column
- invalid time format for timestamp column

Tidiness Issues

weRateDog_df Data Frame

- separate columns for tweet and retweet in weRateDog_df Data Frame
- names of dog in tweet text

twitter_archive_enhanced Data Frame

- dog stage in separate columns in twitter_archive_enhanced Data Frame

image_preidiction Data Frame

- correct prediction of dog type in multiple tables in image_preidiction Data Frame

Clean

Define

- **Create a sepreate columns for days of the week using `appy()` and `.split()` mathods to target the first index**
- **append the new columns to the weRatedog data frame**
- **replace abrivation of day with full naem**

Code

In [23]:

```
weRateDog_df_copy.timestampe.head()
```

Out[23]:

```
0    Tue Aug 01 16:23:56 +0000 2017
1    Tue Aug 01 00:17:27 +0000 2017
2    Mon Jul 31 00:18:03 +0000 2017
3    Sun Jul 30 15:58:51 +0000 2017
4    Sat Jul 29 16:00:24 +0000 2017
Name: timestampe, dtype: object
```

In [24]:

```
day_tweeted = weRateDog_df_copy.timestampe.apply(lambda x: x.split()[0])
```

In [25]:

```
weRateDog_df_copy['day_tweeted'] = day_tweeted.astype(str)
```

In [26]:

```
days_abv_correction = [('sunday', 'Sun'), ('saturday', 'Sat'), ('monday', 'Mon'),
                       ('tuesday', 'Tue'), ('Thursday', 'Thu'), ('wednessday', 'Wed'), ('fr

for days in days_abv_correction:
    weRateDog_df_copy['day_tweeted'].replace(days[1], days[0], inplace=True)
```

Test

In [27]:

```
weRateDog_df_copy.head(3)
```

Out[27]:

	timestampe	tweet_id	tweet_text	tweet_image_url	
0	Tue Aug 01 16:23:56 +0000 2017	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	hre
1	Tue Aug 01 00:17:27 +0000 2017	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	hre
2	Mon Jul 31 00:18:03 +0000 2017	891815181378084864	This is Archie. He is a rare Norwegian Pouncin...	https://twitter.com/dog_rates/status/891815181...	hre

Define

- **Create seperate columns for the time tweeted using `apply()` mathod and `split()` function to on timestamp columns**
- **append the new columns to the weRatedog data frame**

Code

In [28]:

```
time_tweeted = weRateDog_df_copy.timestampe.apply(lambda x: x.split()[3])
```

In [29]:

```
weRateDog_df_copy['time_tweeted'] = time_tweeted
```

Test

In [30]:

```
weRateDog_df_copy.head()
```

Out[30]:

	timestampe	tweet_id	tweet_text	tweet_image_url	
0	Tue Aug 01 16:23:56 +0000 2017	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	hr
1	Tue Aug 01 00:17:27 +0000 2017	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	hr
2	Mon Jul 31 00:18:03 +0000 2017	891815181378084864	This is Archie. He is a rare Norwegian Pouncin...	https://twitter.com/dog_rates/status/891815181...	hr
3	Sun Jul 30 15:58:51 +0000 2017	891689557279858688	This is Darla. She commenced a snooze mid meal...	https://twitter.com/dog_rates/status/891689557...	hr
4	Sat Jul 29 16:00:24 +0000 2017	891327558926688256	This is Franklin. He would like you to stop ca...	https://twitter.com/dog_rates/status/891327558...	hr

Define

- **Change The invalide timestampe columns formate to [`yyyy-mm-dd`] using `apply()` mathod for iterating throug the timestampe columns**
- **using the `split()` string function to convet each valuse to list**
- **converting the the arrary to numpy array by `np.array` and target the index of the numpy array using `np.r_[]`**
- **join the array by `-` using `join()` string function**
- **add coulmn to weRatedog dataframe and delete `timestampe` column**

Code

In [31]:

```
date_tweeted = weRateDog_df_copy.timestampe.apply(lambda x: "-".join(np.array(x.split())[np
```

In [32]:

```
weRateDog_df_copy['date_tweeted'] = date_tweeted
weRateDog_df_copy = weRateDog_df_copy.drop(columns=['timestampe'])
```

Test

In [33]:

```
weRateDog_df_copy.head()
```

Out[33]:

	tweet_id	tweet_text	tweet_image_url	
0	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	href="http://twitte
1	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	href="http://twitte
2	891815181378084864	This is Archie. He is a rare Norwegian Pouncin...	https://twitter.com/dog_rates/status/891815181...	href="http://twitte
3	891689557279858688	This is Darla. She commenced a snooze mid meal...	https://twitter.com/dog_rates/status/891689557...	href="http://twitte
4	891327558926688256	This is Franklin. He would like you to stop ca...	https://twitter.com/dog_rates/status/891327558...	href="http://twitte

Define

- **targetting ratting of dogs in tweet text using `apply()` function and regular expression `re` for extraction**
- **create seperate columns for numeratore and denominatore**

Code

In [34]:

```
# rate_valuse = weRateDog_df.tweet_text.str.extract(r'([0-9]?[0-9]?[1234567890]?[.]?./[0-9]
# tweeter_ratings =

numeratore = weRateDog_df_copy.tweet_text.apply(lambda x: re.findall(r'\b\d+\b', x)[0])
denominatore = weRateDog_df_copy.tweet_text.apply(lambda x: re.findall(r'\b\d+\b', x)[-1])
```

In [35]:

```
weRateDog_df_copy['dog_ratings_numeratore'] = numeratore
weRateDog_df_copy['dog_ratings_denominatore'] = denominatore
```

Test

In [36]:

```
weRateDog_df_copy.head()
```

Out[36]:

	tweet_id	tweet_text	tweet_image_url	
0	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	href="http://twitter.com/download/
1	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	href="http://twitter.com/download/
2	891815181378084864	This is Archie. He is a rare Norwegian Pouncin	https://twitter.com/dog_rates/status/891815181...	href="http://twitter.com/download/

Define

- **extre url links for imagse in text using `apply()` function and regulare expresion `re`**
- **create a seperate columns for extrar_tweet_url for the extration of url line**

Code

In [37]:

```
tweet_text_url = weRateDog_df_copy.tweet_text.apply(lambda x: ''.join(re.findall(r'(https?:
weRateDog_df_copy['tweet_text_url'] = tweet_text_url
```

In [38]:

```
tweet_text_url = twitter_archive_enhanced_copy.text.apply(lambda x: ''.join(re.findall(r'(h
twitter_archive_enhanced_copy['tweet_text_url'] = tweet_text_url
```

Test

In [39]:

```
weRateDog_df_copy.head()
```

Out[39]:

	tweet_id	tweet_text	tweet_image_url	
0	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	href="http://twitter.com/download/
1	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	href="http://twitter.com/download/
2	891815181378084864	This is Archie. He is a rare Norwegian Pouncin	https://twitter.com/dog_rates/status/891815181...	href="http://twitter.com/download/

In [40]:

```
twitter_archive_enhanced_copy.head()
```

Out[40]:

	tweet_id	in_reply_to_status_id	in_reply_to_user_id	timestamp	
0	892420643555336193	NaN	NaN	2017-08-01 16:23:56 +0000	href="http://twitter.c
1	892177421306343426	NaN	NaN	2017-08-01 00:17:27 +0000	href="http://twitter.c
2	891815181378084864	NaN	NaN	2017-07-31 00:18:03 +0000	href="http://twitter.c
3	891689557279858688	NaN	NaN	2017-07-30 15:58:51 +0000	href="http://twitter.c
4	891327558926688256	NaN	NaN	2017-07-29 16:00:24 +0000	href="http://twitter.c

Define

- **exstact dog stage in tweet text using `apply` function to target each valuse text**
- **use list comprehension, `.join()` function and `strip()`**
- **fill empty cell with a dog stage use for any dog called `floof`**

Code

In [41]:

```
dog_stages = ['doggo', 'pupper', 'puppo', 'floof', 'snoot', 'blep']

dog_stage = weRateDog_df.tweet_text.apply(lambda x: ''.join([dog if dog in x else '' for do
```

In [42]:

```
weRateDog_df_copy['dog_stage'] = dog_stage
```

In [43]:

```
weRateDog_df_copy['dog_stage'] = weRateDog_df_copy['dog_stage'].replace('', 'floof')
weRateDog_df_copy['dog_stage'] = weRateDog_df_copy['dog_stage'].fillna('floof')
```

Test

In [44]:

```
weRateDog_df_copy.head(50)
```

Out[44]:

	tweet_id	tweet_text	tweet_image_url	
0	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	href="http://twitter.com
1	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	href="http://twitter.com
2	891815181378084864	This is Archie. He is a rare Norwegian Pouncin...	https://twitter.com/dog_rates/status/891815181...	href="http://twitter.com
3	891689557279858688	This is Darla. She commenced a snooze mid meal...	https://twitter.com/dog_rates/status/891689557...	href="http://twitter.com
4	891327558926688256	This is Franklin. He would like you to stop	https://twitter.com/dog_rates/status/891327558...	href="http://twitter.com

In [45]:

```
weRateDog_df_copy.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2354 entries, 0 to 2353
Data columns (total 14 columns):
 #   Column                    Non-Null Count  Dtype 
---  ------                    --------------  ----- 
 0   tweet_id                  2354 non-null   int64 
 1   tweet_text                2354 non-null   object
 2   tweet_image_url           2073 non-null   object
 3   source                    2354 non-null   object
 4   retweet_count             2354 non-null   int64 
 5   favorite_count            2354 non-null   int64 
 6   follwers_count            2354 non-null   int64 
 7   day_tweeted               2354 non-null   object
 8   time_tweeted              2354 non-null   object
 9   date_tweeted              2354 non-null   object
 10  dog_ratings_numeratore    2354 non-null   object
 11  dog_ratings_denominatore  2354 non-null   object
 12  tweet_text_url            2354 non-null   object
 13  dog_stage                 2354 non-null   object
dtypes: int64(4), object(10)
memory usage: 257.6+ KB
```

Define

- **exstarct the accual sourse of tweet using apply() method split() function**
- **index througe the split() list and use the replace() function to replace [</a] with empty space**
- **delete source function**

Code

In [46]:

```
twitter_source = weRateDog_df_copy.source.apply(lambda x: x.split('>')[1].replace('</a', ''

twitter_source_enhanced = twitter_archive_enhanced_copy.source.apply(lambda x: x.split('>')
```

In [47]:

```
weRateDog_df_copy['twitter_source'] = twitter_source

twitter_archive_enhanced_copy['twitter_source_enhanced'] = twitter_source_enhanced
```

In [48]:

```
weRateDog_df_copy = weRateDog_df_copy.drop(columns='source')

twitter_archive_enhanced_copy = twitter_archive_enhanced_copy.drop(columns='source')
```

Test

In [49]:

```
weRateDog_df_copy.head()
```

Out[49]:

	tweet_id	tweet_text	tweet_image_url	retweet_count	favorite_count
0	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	8853	39467
1	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	6514	33819
2	891815181378084864	This is Archie. He is a rare Norwegian Pouncin	https://twitter.com/dog_rates/status/891815181...	4328	25461

In [50]:

```
twitter_archive_enhanced_copy.head()
```

Out[50]:

	tweet_id	in_reply_to_status_id	in_reply_to_user_id	timestamp	text	retw
0	892420643555336193	NaN	NaN	2017-08-01 16:23:56 +0000	This is Phineas. He's a mystical boy. Only eve...	
1	892177421306343426	NaN	NaN	2017-08-01 00:17:27 +0000	This is Tilly. She's just checking pup on you....	
2	891815181378084864	NaN	NaN	2017-07-31 00:18:03 +0000	This is Archie. He is a rare Norwegian Pouncin...	
3	891689557279858688	NaN	NaN	2017-07-30 15:58:51 +0000	This is Darla. She commenced a snooze mid meal...	
4	891327558926688256	NaN	NaN	2017-07-29 16:00:24 +0000	This is Franklin. He would like you to stop ca...	

Define

- **Create a columns for that identify retweet and tweet**
- **use `.apply()` to tagert each text**
- **list comprehention and indexing to target results**

Code

In [51]:

```
isRetweet = ['RT']

tweet_type = weRateDog_df_copy.tweet_text.apply(lambda x: ['Retweet' if t in x else 'Tweet'
```

In [52]:

```
weRateDog_df_copy['tweet_type'] = tweet_type
```

Test

In [53]:

```
weRateDog_df_copy.head(50)
```

Out[53]:

	tweet_id	tweet_text	tweet_image_url	retweet_count	favo
0	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	8853	
1	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	6514	
2	891815181378084864	This is Archie. He is a rare Norwegian Pouncin...	https://twitter.com/dog_rates/status/891815181...	4328	
3	891689557279858688	This is Darla. She commenced a snooze mid meal...	https://twitter.com/dog_rates/status/891689557...	8964	
4	891327558926688256	This is Franklin. He would like you to stop	https://twitter.com/dog_rates/status/891327558...	9774	

In [54]:

```
weRateDog_df_copy.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2354 entries, 0 to 2353
Data columns (total 15 columns):
 #   Column                    Non-Null Count  Dtype 
---  ------                    --------------  ----- 
 0   tweet_id                  2354 non-null   int64 
 1   tweet_text                2354 non-null   object
 2   tweet_image_url           2073 non-null   object
 3   retweet_count             2354 non-null   int64 
 4   favorite_count            2354 non-null   int64 
 5   follwers_count            2354 non-null   int64 
 6   day_tweeted               2354 non-null   object
 7   time_tweeted              2354 non-null   object
 8   date_tweeted              2354 non-null   object
 9   dog_ratings_numeratore    2354 non-null   object
 10  dog_ratings_denominatore  2354 non-null   object
 11  tweet_text_url            2354 non-null   object
 12  dog_stage                 2354 non-null   object
 13  twitter_source            2354 non-null   object
 14  tweet_type                2354 non-null   object
dtypes: int64(4), object(11)
memory usage: 276.0+ KB
```

In [55]:

```
twitter_archive_enhanced.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
```

Define

- Convert data_tweeted columns data type from string to time data type using `pd.to_datetime()` method

- Convert `timestamp` columns data type in twitter_archive_enhanced data frame from string to datetime using pandas method `pd.to_datetime()`

Code

In [56]:

```
weRateDog_df_copy['date_tweeted'] = pd.to_datetime(weRateDog_df_copy.date_tweeted)
```

In [57]:

```
twitter_archive_enhanced_copy['timestamp'] = pd.to_datetime(twitter_archive_enhanced_copy['
```

Test

In [58]:

```
weRateDog_df_copy.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2354 entries, 0 to 2353
Data columns (total 15 columns):
 #   Column                   Non-Null Count  Dtype
---  ------                   --------------  -----
 0   tweet_id                 2354 non-null   int64
 1   tweet_text               2354 non-null   object
 2   tweet_image_url          2073 non-null   object
 3   retweet_count            2354 non-null   int64
 4   favorite_count           2354 non-null   int64
 5   follwers_count           2354 non-null   int64
 6   day_tweeted              2354 non-null   object
 7   time_tweeted             2354 non-null   object
 8   date_tweeted             2354 non-null   datetime64[ns]
 9   dog_ratings_numeratore   2354 non-null   object
 10  dog_ratings_denominatore 2354 non-null   object
 11  tweet_text_url           2354 non-null   object
 12  dog_stage                2354 non-null   object
 13  twitter_source           2354 non-null   object
 14  tweet_type               2354 non-null   object
dtypes: datetime64[ns](1), int64(4), object(10)
memory usage: 276.0+ KB
```

In [59]:

```
twitter_archive_enhanced_copy.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2356 entries, 0 to 2355
Data columns (total 18 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   datetime64[ns, UTC]
 4   text                        2356 non-null   object
 5   retweeted_status_id         181 non-null    float64
 6   retweeted_status_user_id    181 non-null    float64
 7   retweeted_status_timestamp  181 non-null    object
 8   expanded_urls               2297 non-null   object
 9   rating_numerator            2356 non-null   int64
 10  rating_denominator          2356 non-null   int64
 11  name                        2356 non-null   object
 12  doggo                       2356 non-null   object
 13  floofer                     2356 non-null   object
```

Define

- **Convert dog_ratings_numeratore and dog_ratings_denominatore columns from object to integer using `astype()`**

Code

In [60]:

```
weRateDog_df_copy[['dog_ratings_numeratore', 'dog_ratings_denominatore']] = weRateDog_df_co
```

Test

In [61]:

```
weRateDog_df_copy.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2354 entries, 0 to 2353
Data columns (total 15 columns):
 #   Column                    Non-Null Count  Dtype
---  ------                    --------------  -----
 0   tweet_id                  2354 non-null   int64
 1   tweet_text                2354 non-null   object
 2   tweet_image_url           2073 non-null   object
 3   retweet_count             2354 non-null   int64
 4   favorite_count            2354 non-null   int64
 5   follwers_count            2354 non-null   int64
 6   day_tweeted               2354 non-null   object
 7   time_tweeted              2354 non-null   object
 8   date_tweeted              2354 non-null   datetime64[ns]
 9   dog_ratings_numeratore    2354 non-null   int32
 10  dog_ratings_denominatore  2354 non-null   int32
 11  tweet_text_url            2354 non-null   object
 12  dog_stage                 2354 non-null   object
 13  twitter_source            2354 non-null   object
```

Define

- **Target name of dog columns in twitter_archive_enhanced_copy**
- **create a new column by joining the name of dogs from twitter_archive_enhanced_copy to weRateDog_df_copy**

Code

In [62]:

```
# name_id_target
# weRateDog_df_copy['dog_names'] = twitter_archive_enhanced_copy.name
weRateDog_df_copy = weRateDog_df_copy.merge(twitter_archive_enhanced_copy[['tweet_id','name
```

Test

In [63]:

```
weRateDog_df_copy.head()
```

Out[63]:

	tweet_id	tweet_text	tweet_image_url	retweet_count	favorite_count
0	892420643555336193	This is Phineas. He's a mystical boy. Only eve...	https://twitter.com/dog_rates/status/892420643...	8853	39467
1	892177421306343426	This is Tilly. She's just checking pup on you....	https://twitter.com/dog_rates/status/892177421...	6514	33819
2	891815181378084864	This is Archie. He is a rare Norwegian Pouncin	https://twitter.com/dog_rates/status/891815181...	4328	25461

Define

- **join dog stages `doggo` , `floofer` , `pupper` , `puppo` into a single columns**
- **delete all sepert colmns for dog stage**
- **replace all empty cells with a porpular defination for all dogs `floofer`**

Code

In [64]:

```
twitter_archive_enhanced_copy['stage'] = twitter_archive_enhanced_copy['doggo'] + twitter_a
```

In [65]:

```
replace_tages = ['NoneNoneNoneNone', 'NoneNoneNone', 'NoneNone', 'None']
for rep in replace_tages:
    twitter_archive_enhanced_copy['stage'] = twitter_archive_enhanced_copy['stage'].apply(l
```

In [66]:

```
twitter_archive_enhanced_copy = twitter_archive_enhanced_copy.drop(columns=['doggo', 'floof
```

In [67]:

```
twitter_archive_enhanced_copy['stage'] = twitter_archive_enhanced_copy['stage'].replace('',
```

Test

In [68]:

```
twitter_archive_enhanced_copy.head()
```

Out[68]:

	tweet_id	in_reply_to_status_id	in_reply_to_user_id	timestamp	text	r
0	892420643555336193	NaN	NaN	2017-08-01 16:23:56+00:00	This is Phineas. He's a mystical boy. Only eve...	
1	892177421306343426	NaN	NaN	2017-08-01 00:17:27+00:00	This is Tilly. She's just checking pup on you....	
2	891815181378084864	NaN	NaN	2017-07-31 00:18:03+00:00	This is Archie. He is a rare Norwegian Pouncin...	
3	891689557279858688	NaN	NaN	2017-07-30 15:58:51+00:00	This is Darla. She commenced a snooze mid meal...	
4	891327558926688256	NaN	NaN	2017-07-29 16:00:24+00:00	This is Franklin. He would like you to stop ca...	

Define

- **raname the columns names with `P` and replace them with `prediction`**

Code

In [69]:

```
replace_columns_names = ['p1', 'p1_conf', 'p1_dog', 'p2', 'p2_conf', 'p2_dog', 'p3', 'p3_co

for x in replace_columns_names:
    image_preidiction_copy.rename(columns={x: x.replace('p', 'prediction')}, inplace=True)
```

Test

In [70]:

```
image_preidiction_copy.head()
```

Out[70]:

	tweet_id	jpg_url	img_num	p
0	666020888022790149	https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg	1	Welsh_spring
1	666029285002620928	https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg	1	
2	666033412701032449	https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg	1	German
3	666044226329800704	https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg	1	Rhodesian
4	666049248165822465	https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg	1	miniature

Define

- **create a seperate columns for if tweets or retweet by mergin from weRateDog_df tweet_type columns with image_preidiction on the condition of there tweet_id**

Code

In [71]:

```
tweet_types = weRateDog_df_copy[['tweet_id', 'tweet_type']]

image_preidiction_copy = image_preidiction_copy.merge(tweet_types, left_on='tweet_id', righ
```

Test

In [72]:

```
image_preidiction_copy.head()
```

Out[72]:

	tweet_id	jpg_url	img_num	p
0	666020888022790149	https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg	1	Welsh_spring
1	666029285002620928	https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg	1	
2	666033412701032449	https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg	1	German
3	666044226329800704	https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg	1	Rhodesian
4	666049248165822465	https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg	1	miniature

In [ ]:

```

```

In [ ]:

```
```

In [73]:

```
weRateDog_df_copy.to_csv('twitter_archive_master.csv')
```

In [74]:

```
if not os.path.exists('twitter_archive_master.db'):
    engine = create_engine('sqlite:///twitter_archive_master.db')
    weRateDog_df_copy.to_sql('master', engine, index=False)
```

Explore Data Analysis

WHAT TYPE OF DOG STAGE HAS MORE LIKES ON AVERAGE

In [75]:

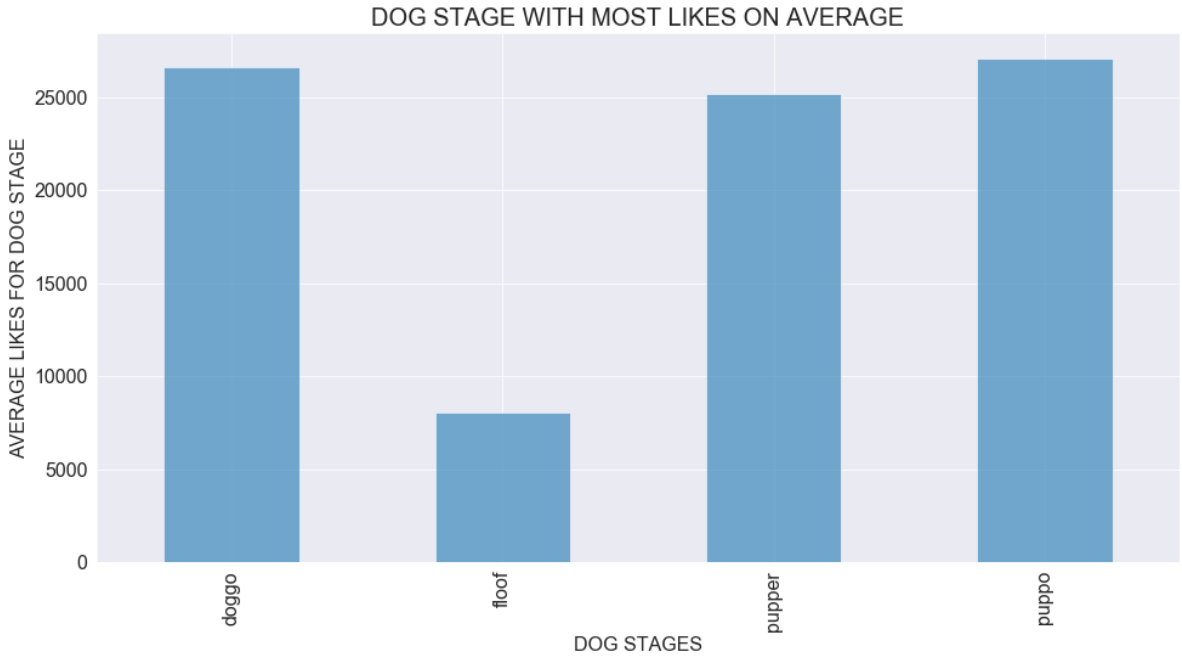
```
weRateDog_df_copy.groupby('dog_stage')['favorite_count'].mean()
```

Out[75]:

```
dog_stage
doggo     26619.000000
floof      8034.394378
pupper    25213.500000
puppo     27088.500000
Name: favorite_count, dtype: float64
```

In [76]:

```
weRateDog_df_copy.groupby('dog_stage')['favorite_count'].mean().plot(kind='bar', alpha=.6,f
plt.title('DOG STAGE WITH MOST LIKES ON AVERAGE', fontsize=20)
plt.xlabel('DOG STAGES', fontsize=16)
plt.ylabel('AVERAGE LIKES FOR DOG STAGE', fontsize=16);
```



WHAT TYPEP OF DOG STAGE HAS THE HEIGHEST NUMERATORE RATTINGS ON AVERAGE

In [77]:

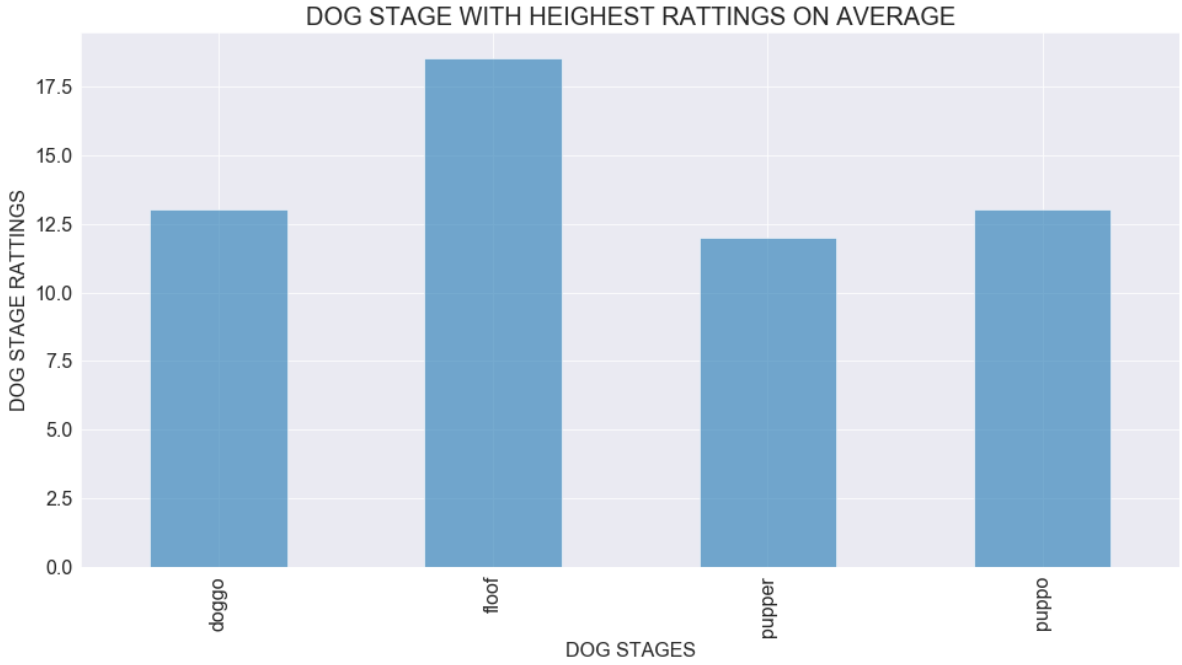
```
weRateDog_df_copy.groupby('dog_stage')['dog_ratings_numeratore'].mean()
```

Out[77]:

```
dog_stage
doggo     13.000000
floof     18.529387
pupper    12.000000
puppo     13.000000
Name: dog_ratings_numeratore, dtype: float64
```

In [78]:

```
weRateDog_df_copy.groupby('dog_stage')['dog_ratings_numeratore'].mean().plot(kind='bar',alp
plt.title('DOG STAGE WITH HEIGHEST RATTINGS ON AVERAGE', fontsize=20)
plt.xlabel('DOG STAGES', fontsize=16)
plt.ylabel('DOG STAGE RATTINGS', fontsize=16);
```



WHAT DAY OF THE WEEK HAS MORE TWEETS OVER THE YEARS

In [79]:

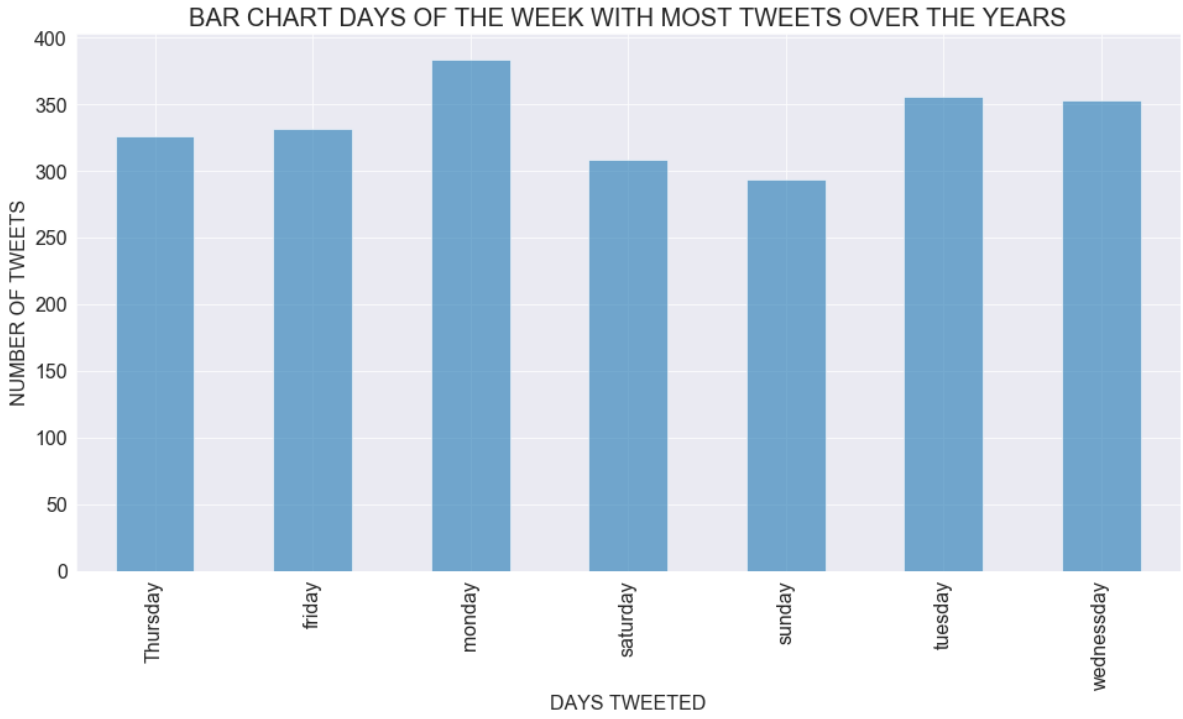
```
weRateDog_df_copy.groupby('day_tweeted').count()['tweet_type']
```

Out[79]:

```
day_tweeted
Thursday      326
friday        332
monday        384
saturday      309
sunday        294
tuesday       356
wednessday    353
Name: tweet_type, dtype: int64
```

In [80]:

```
weRateDog_df_copy.groupby('day_tweeted').count()['tweet_type'].plot(kind='bar', alpha=.6,fi
plt.title('BAR CHART DAYS OF THE WEEK WITH MOST TWEETS OVER THE YEARS', fontsize=20)
plt.xlabel('DAYS TWEETED', fontsize=16)
plt.ylabel('NUMBER OF TWEETS', fontsize=16);
```



WHICH DOG STAGE ON AVERAGE HAS THE MOST LIKES IN EACH YEAR

In [81]:

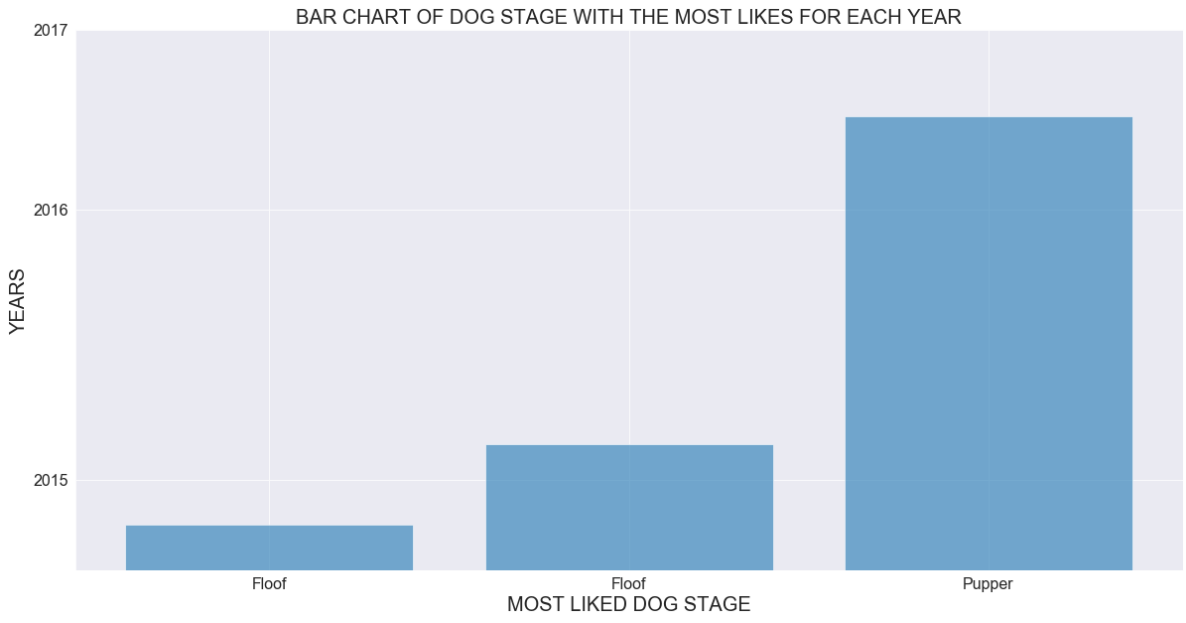
```
year_tweeted = weRateDog_df_copy['date_tweeted'].apply(lambda x: str(x).split('-')[0])

weRateDog_df_copy['year_tweeted'] = year_tweeted.astype(int)

dogStageYear = weRateDog_df_copy.groupby(['year_tweeted', 'dog_stage'], as_index=False).mea

dogStageYear
```

Out[81]:

	year_tweeted	dog_stage	favorite_count
0	2015	floof	2519.078261
1	2016	floof	6997.131134
4	2017	pupper	25213.500000

In [82]:

```
y = dogStageYear['favorite_count']
x = range(3)
plt.figure(figsize=(20,10))
plt.rc('xtick', labelsize=16)
plt.rc('ytick', labelsize=16)
plt.bar(x, y, alpha=.6)
plt.title('BAR CHART OF DOG STAGE WITH THE MOST LIKES FOR EACH YEAR', fontsize=20)
plt.xlabel('MOST LIKED DOG STAGE', fontsize=20)
plt.ylabel('YEARS', fontsize=20)
X_location = [0.0, 1.0, 2.0]
X_label = ['Floof', 'Floof', 'Pupper']
plt.xticks(X_location, X_label)
y_loc = [30000, 20000, 5000]
y_label = [2017, 2016, 2015]
plt.yticks(y_loc, y_label);
plt.savefig('prediction_1.png')
```



NUMBER OF RETWEET VAS TWEET OVER THE YEARS

In [83]:

```
Retweet = weRateDog_df_copy.groupby(['tweet_type', 'year_tweeted'], as_index=False).count()
Retweet
```

Out[83]:

	tweet_type	year_tweeted	tweet_text
0	Retweet	2015	5
1	Retweet	2016	101
2	Retweet	2017	84

In [84]:

```
Tweet = weRateDog_df_copy.groupby(['tweet_type', 'year_tweeted'], as_index=False).count().q
Tweet
```

Out[84]:

	tweet_type	year_tweeted	tweet_text
3	Tweet	2015	685
4	Tweet	2016	1081
5	Tweet	2017	398

WHAT PERCENTAGE OF TWEETED PICTURES THAT WAS ACCUALY DOG AND WHAT PERCENATGE OF TWEETED PICTURS THAT WERE NOT ACCUALLY DOGS?

In [85]:

```
pred_1 = (image_preidiction_copy.query('tweet_type == "Tweet"').groupby('prediction1_dog').
pred_1
```

Out[85]:

```
prediction1_dog
False    24.891462
True     70.911722
Name: prediction1, dtype: float64
```

In [86]:

```
pred_2 = (image_preidiction_copy.query('tweet_type == "Tweet"').groupby('prediction2_dog').
pred_2
```

Out[86]:

```
prediction2_dog
False    24.023155
True     71.780029
Name: prediction2, dtype: float64
```

In [87]:

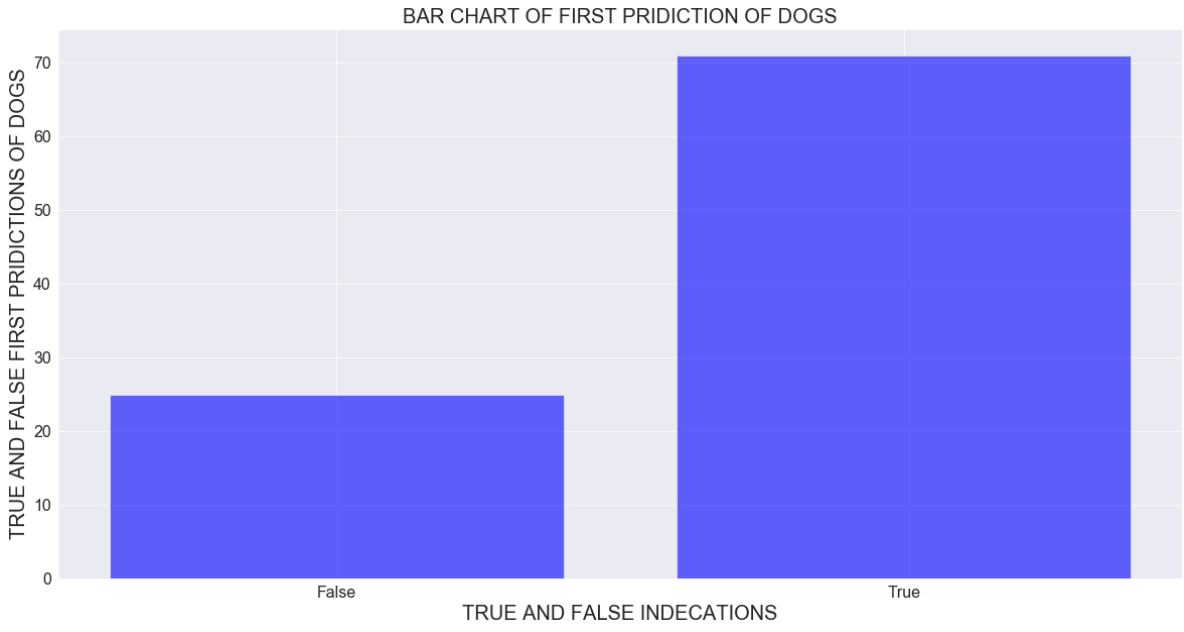
```
pred_3 = (image_preidiction_copy.query('tweet_type == "Tweet"').groupby('prediction3_dog').
pred_3
```

Out[87]:

```
prediction3_dog
False    26.435118
True     69.368066
Name: prediction3, dtype: float64
```

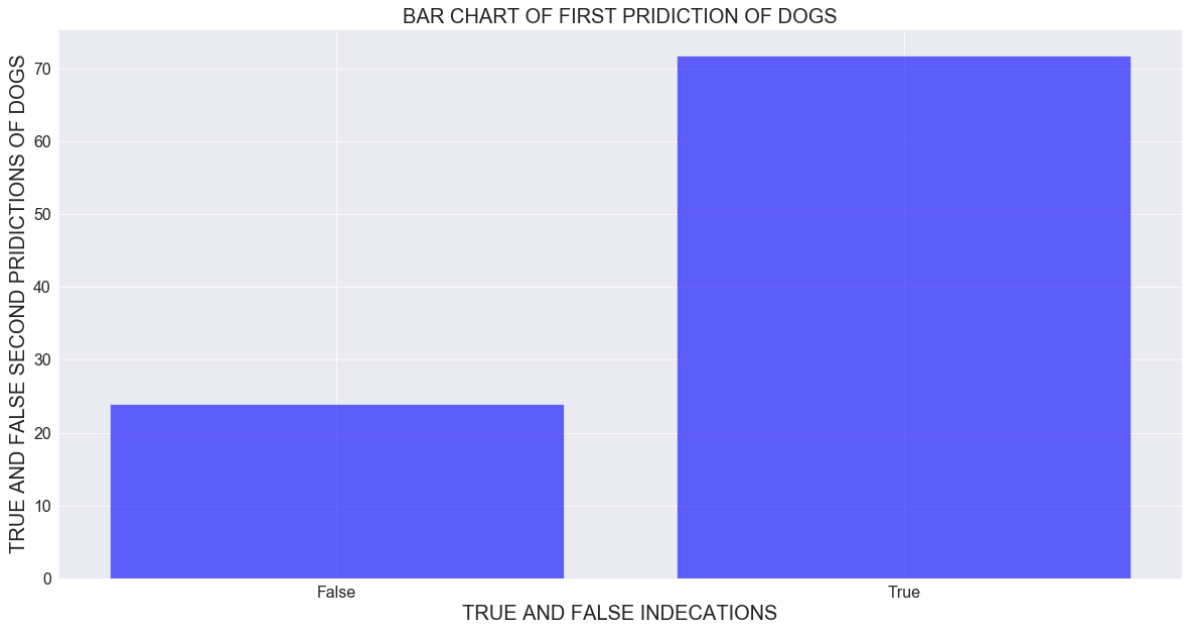
In [88]:

```
x_01 = list(pred_1)
y = [1, 2]
plt.figure(figsize=(20,10))
plt.rc('xtick', labelsize=16)
plt.rc('ytick', labelsize=16)
plt.bar(y, x_01, alpha=0.6, color='b')
plt.title('BAR CHART OF FIRST PRIDICTION OF DOGS', fontsize=20)
plt.xlabel('TRUE AND FALSE INDECATIONS', fontsize=20)
plt.ylabel('TRUE AND FALSE FIRST PRIDICTIONS OF DOGS', fontsize=20)
loc = [2.00, 1.00]
lab = ['True', 'False']
plt.xticks(loc, lab);
```



In [89]:

```
x_02 = list(pred_2)
y = [1, 2]
plt.figure(figsize=(20,10))
plt.rc('xtick', labelsize=16)
plt.rc('ytick', labelsize=16)
plt.bar(y, x_02, alpha=0.6, color='b')
plt.title('BAR CHART OF FIRST PRIDICTION OF DOGS', fontsize=20)
plt.xlabel('TRUE AND FALSE INDECATIONS', fontsize=20)
plt.ylabel('TRUE AND FALSE SECOND PRIDICTIONS OF DOGS', fontsize=20)
loc = [2.00, 1.00]
lab = ['True', 'False']
plt.xticks(loc, lab);
```



In [90]:

```
y = [1, 2]
x_03 = list(pred_3)
plt.figure(figsize=(20,10))
plt.rc('xtick', labelsize=16)
plt.rc('ytick', labelsize=16)
plt.bar(y, x_03, alpha=0.6, color='b')
plt.title('BAR CHART OF FIRST PRIDICTION OF DOGS', fontsize=20)
plt.xlabel('TRUE AND FALSE INDECATIONS', fontsize=20)
plt.ylabel('TRUE AND FALSE THIRD PRIDICTIONS OF DOGS', fontsize=20)
loc = [2.00, 1.00]
lab = ['True', 'False']
plt.xticks(loc, lab);
```