Introduction: The purpose of thid project is to collect from 3 data sources, clean for tideness and qualty then combine them into one dtaframe

Process a) Gathering data, the data sources will be: i) twitter_archive_enhanced.csv (1) Import data and create DataFrame (2) Inspect data, Confirm the tweet_id column is the appropriate data type (integer), this important as this will be the column used to join the data files. (3) report findings for quality and tidiness deficiencies (4) perform remediations b) image_predictions.tsv (1) import data and create DataFrame (2) inspect data. Confirm the tweet_id column is the appropriate data type (integer), this important as this will be the column used to join the data files. (3) report findings for quality and tidiness deficiencies (4) perform remediations
c) tweet_json.txt (1) import data and create DataFrame (2) inspect data. Confirm the tweet_id column is the appropriate data type (integer), this important as this will be the column used to join the data files. (3) report findings for quality and tidiness deficiencies (4) perform remediations

Data Gathering

```
WeRateDogs Twitter archive data (twitter_archive_enhanced.csv)
tweet image prediction (image_predictions.tsv)
Tweets Data
```

In [1]:

```
#import needed libraries ( will not be accessing twitter data directly )
import requests
import tweepy
import json
import pandas as pd
import numpy as np
import requests
import matplotlib.pyplot as plt
```

Import Twitter Archive data

In [2]:

```
# Import Twitter Archive data,twitter_archive data is a provided file, so this w
# ta_tf == Twitter Archive DataFrame
ta_df = pd.read_csv\
('https://d17h27t6h515a5.cloudfront.net/topher/2017/August/59a4e958_twitter-arch
# confirm dataframe creation
ta_df.shape
```

Out[2]:

```
(2356, 17)
```

Import image predictions

In [3]:

```
#import image  predictions file using requests
url=('https://d17h27t6h515a5.cloudfront.net/topher/2017/August/599fd2ad_image-pr
x = requests.get(url)
```

```
open('image_predictions.tsv', 'wb').write(x.content)
#IP_df =+ image predictions dataframe
IP_df = pd.read_csv('image_predictions.tsv', sep = '\t')
# confirm dataframe
IP_df.shape
```

Out[3]:
```
(2075, 12)
```

import tweets and create Json file

In [4]:
```
#As there were issues with my Twitter Developer account, I used the tweet-json f
#variables of intrest are tweet_id, retweet_count, favorite_count
tweets_list =[]

with open('/Users/michaelmohle/Desktop/wrangle/tweet-json.txt') as json_file:
    for line in json_file:

        tweets_dict = {}
        tweets_json = json.loads(line)

        try:
            tweets_dict['tweet_id'] = tweets_json['extended_entities']['media'][
        except:
            tweets_dict['tweet_id'] = 'na'

        tweets_dict['retweet_count'] = tweets_json['retweet_count']
        tweets_dict['favorite_count'] = tweets_json['favorite_count']

        tweets_list.append(tweets_dict)
#convert dictionary to datafrane
tweets_df = pd.DataFrame(tweets_list)
# confirm dataframe
tweets_df.shape
```

Out[4]:
```
(2354, 3)
```

Assess and evaluate data

For each of the 3 data files the file head and info will be inspected. Based upon the resukts addional inspections may be made,

In [5]:
```
ta_df.head()
```

Out[5]:

	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.

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

In [6]:

```
ta_df.info()
```

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

In [7]:

```
IP_df.head()
```

Out[7]:

	tweet_id	jpg_url	img_num	
0	666020888022790149	https://pbs.twimg.com/media/CT4udn0WwAA0aMy.jpg	1	Welsh_spring
1	666029285002620928	https://pbs.twimg.com/media/CT42GRgUYAA5iDo.jpg	1	

	tweet_id	jpg_url	img_num	
2	666033412701032449	https://pbs.twimg.com/media/CT4521TWwAEvMyu.jpg	1	Germar
3	666044226329800704	https://pbs.twimg.com/media/CT5Dr8HUEAA-lEu.jpg	1	Rhodesian
4	666049248165822465	https://pbs.twimg.com/media/CT5IQmsXIAAKY4A.jpg	1	miniatur

In [8]:

```
IP_df.info()
```

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

In [9]:

```
tweets_df.head()
```

Out[9]:

	tweet_id	retweet_count	favorite_count
0	892420639486877696	8853	39467
1	892177413194625024	6514	33819
2	891815175371796480	4328	25461
3	891689552724799489	8964	42908
4	891327551943041024	9774	41048

In [10]:

```
tweets_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2354 entries, 0 to 2353
Data columns (total 3 columns):
 #   Column          Non-Null Count  Dtype 
---  ------          --------------  ----- 
 0   tweet_id        2354 non-null   object
 1   retweet_count   2354 non-null   int64 
 2   favorite_count  2354 non-null   int64 
dtypes: int64(2), object(1)
memory usage: 55.3+ KB
```

Tideness issues

1. For twitter-archive: Dog catagory values are spread accross the doggo, floofer, pupper, and puppo columns
2. For twitter-archive: Retweet/In Reply rows could potentialy refer to already exsisting tweet rows thus raising the prospect of multiple rows with same original tweet ID

Quality issues

1. For twitter-archive numerator ratings: some values lie outside the 1-10 range thus skewing the data
2. For twitter-archive denominator ratings: some values lie outside the 1-10 range thus skewing the data. in one case the value is zero thus amaking any calculated value using this data problematic.
3. For twitter-archive: In some cases there may be multiple values for a row in doggo, floofer, pupper, and puppo columns, this will be determine once the informstion in those 4 columns is transformed from wide to tall.
4. For twitter-archive: In isolation the numeraor and denomenator columns lack value, a new calculated column needs to created that provides a rating value, making it easier to perform analysis.
5. For image predications, some images in the p1 column (highest confidence) have a false value.
6. For image predications: p2, p2_conf, p2_dog, p3, p3_conf, p3_dogare unnessary as we should default to the value with the highest confidence/
7. For Tweets: some values in tweet_id are not integers (this will be the value used to join dataframes
8. Some column headings are unclear (Twitter Archive: source, image predictions: p1 and will be renamed in the interest of clarity

Prior to remediation copies of the dataframes will be made.

In [11]:

```
ta_df_new = ta_df.copy()
IP_df_new = IP_df.copy()
tweets_df_new = tweets_df.copy()
```

In [12]:

```
x, y, z = ta_df_new.shape, IP_df_new.shape, tweets_df_new.shape
print(x,y,z)
# confirm copy, expected values: (2356, 17),(2075, 12), (2354, 3)
```

```
(2356, 17) (2075, 12) (2354, 3)
```

Data Quality Issue 3

Note:

Quality issue 3 is taken out of order aso as to address tideness issues first

Define Quality Issue 3.

For twitter-archive: In some cases there are multiple values for a row in doggo, floofer, pupper, and puppo columns.

Remidiation code Quality Issue 3

In [13]:

```
#check if rows have multiple value aside from none.
multiples = []
for i in range(0, len(ta_df_new.index)):
    if ta_df_new.doggo[i] == 'doggo' and (ta_df_new.floofer[i] == 'floofer' \
                                          or ta_df_new.pupper[i] == 'pupper' \
                                          or ta_df_new.puppo[i] == 'puppo'):
        multiples.append(i)
# print number of rows with multibile values then the row numbers
print(len(multiples))
print(multiples)
```

```
14
[191, 200, 460, 531, 565, 575, 705, 733, 778, 822, 889, 956, 1063, 1113]
```

In [14]:

```
# starting value, used to confirm the drop
x = ta_df_new.shape
#drop rows with multipile values
ta_df_new.drop(multiples, axis = 0, inplace = True)
```

Test remediation code Quality Issue 3

In [15]:

```
y = ta_df_new.shape
# value after drop, used to confirm the drop
print(x, y)
```

```
(2356, 17) (2342, 17)
```

Tideness Issue 1

Define Tideness Issue 1

For twitter-archive: Dog catagory values are spread accross the doggo, floofer, pupper, and puppo columns

Remidiation code Tideness Issue 1

In [16]:

```
melt_columns = ['doggo', 'floofer', 'pupper', 'puppo']
catogory_columns = [x for x in ta_df_new.columns.tolist() if x not in melt_colum
```

```
ta_df_new = pd.melt(ta_df_new, id_vars = catogory_columns, value_vars = melt_col
                    var_name = 'Type', value_name = 'Dog_type')
```

In [17]:

```
#Drop 'Type' column
ta_df_new = ta_df_new.drop('Type', 1)
```

Test remediation code Tideness Issue 1

In [18]:

```
ta_df_new['Dog_type'].value_counts()
```

Out[18]:

```
None        9002
pupper       245
doggo         83
puppo         29
floofer        9
Name: Dog_type, dtype: int64
```

Tideness issue 2

Define Tideness Issue 2

For twitter-archive: Retweet/In Reply rows could potentially refer to already existing tweet rows thus raising the prospect of multiple rows with same original tweet ID

Determine number of rows to be deleted

In [19]:

```
#get row count to be dropped
ta_df_new.in_reply_to_status_id.notnull().sum()
```

Out[19]:

```
308
```

Remidiation code Tideness Issue 2

In [22]:

```
#drop rows with value in 'retweeted_status_id'
ta_df_new.drop(ta_df_new[ta_df_new.in_reply_to_status_id.notnull()].index, inpla
```

Test remediation code Tideness Issue 2

In [23]:

```
ta_df_new.in_reply_to_status_id.notnull().sum()
```

Out[23]:

```
0
```

Quality Issues 1 - 8 (not including 3(above))

Data Quality Issue 1.

Define Quality Issue 1

For twitter-archive numerator ratings: some values lie outside the 1-10 range thus skewing the data

In [24]:

```
#Determine scope of issue
# get value counts for numerator
ta_df_new['rating_numerator'].value_counts()
```

Out[24]:

```
12      1920
10      1740
11      1648
13      1140
9        612
8        392
7        208
14       152
5        132
6        128
3         76
4         64
2         36
1         20
45         4
44         4
165        4
420        4
204        4
84         4
60         4
0          4
99         4
75         4
50         4
26         4
121        4
1776       4
144        4
88         4
80         4
24         4
27         4
Name: rating_numerator, dtype: int64
```

Remidiation code Quality Issue 1

In [25]:

```
ta_df_new.loc[ta_df_new['rating_numerator'] > 10, 'rating_numerator'] = 10
```

Test remediation code Quality Issue 1

In [26]:

```
ta_df_new['rating_numerator'].value_counts()
```

Out[26]:
```
10     6672
9       612
8       392
7       208
5       132
6       128
3        76
4        64
2        36
1        20
0         4
Name: rating_numerator, dtype: int64
```

Data Quality Issue 2

Define Quality Issue 2

For twitter-archive denominator ratings: some values lie outside the 1-10 range thus skewing the data.

In [27]:
```
# determine scope of issue
ta_df_new['rating_denominator'].value_counts()
```

Out[27]:
```
10      8276
50        12
80         8
11         8
40         4
120        4
2          4
90         4
170        4
20         4
70         4
110        4
150        4
7          4
Name: rating_denominator, dtype: int64
```

Remediation code Quality Issue 2

In [28]:
```
# set all denominator values to 10
ta_df_new['rating_denominator'] = 10
```

Test remediation code Quality Issue 2

In [29]:
```
ta_df_new['rating_denominator'].value_counts()
```

Out[29]:
```
10     8344
Name: rating_denominator, dtype: int64
```

Data Quality Issue 3

addressed above

Data Quality Issue 4

Define Quality Issue 4

For twitter-archive: In isolation the numerator and denominator columns lack value, a new calculated column needs to created that provides a rating value, making it easier to perform analysis.

Remediation code Quality Issue 4

In [30]:

```
# create calculated column
ta_df_new['Rating'] = ta_df_new['rating_numerator']/ta_df_new['rating_denominato
```

Test remediation code Quality Issue 4

In [31]:

```
ta_df_new.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 8344 entries, 0 to 9367
Data columns (total 15 columns):
 #   Column                      Non-Null Count  Dtype  
---  ------                      --------------  -----  
 0   tweet_id                    8344 non-null   int64  
 1   in_reply_to_status_id       0 non-null      float64
 2   in_reply_to_user_id         0 non-null      float64
 3   timestamp                   8344 non-null   object 
 4   source                      8344 non-null   object 
 5   text                        8344 non-null   object 
 6   retweeted_status_id         0 non-null      float64
 7   retweeted_status_user_id    0 non-null      float64
 8   retweeted_status_timestamp  0 non-null      object 
 9   expanded_urls               8332 non-null   object 
 10  rating_numerator            8344 non-null   int64  
 11  rating_denominator          8344 non-null   int64  
 12  name                        8344 non-null   object 
 13  Dog_type                    8344 non-null   object 
 14  Rating                      8344 non-null   float64
dtypes: float64(5), int64(3), object(7)
memory usage: 1.0+ MB
```

Data Quality Issue 5

Define Quality Issue 5

For image predications, some images in the p1 column (highest confidence) have a false value. As such these rows will be dropped

Remediation code Quality Issue 5

In [32]:

```
#determine count of rows to be dropped
IP_df_new['p1_dog'].value_counts()
```

Out[32]:

```
True     1532
False     543
Name: p1_dog, dtype: int64
```

In [34]:

```
#drop rows where value in p1_dog is false
IP_df_new.drop(IP_df_new[IP_df_new['p1_dog']  == False].index, inplace =
True)
```

Test remediation code Quality Issue 5

In [35]:

```
#confirm drop
IP_df_new['p1_dog'].value_counts()
```

Out[35]:

```
True    1532
Name: p1_dog, dtype: int64
```

In [36]:

```
# inspect p1 for non dog types
IP_df_new['p1'].value_counts()
```

Out[36]:

```
golden_retriever      150
Labrador_retriever    100
Pembroke               89
Chihuahua              83
pug                    57
                     ... 
groenendael             1
EntleBucher             1
clumber                 1
Scotch_terrier          1
Japanese_spaniel        1
Name: p1, Length: 111, dtype: int64
```

to the best of my knowledge these are all dog breeds

Data Quality Issue 6

Define Quality Issue 6

For image predications: p2, p2_conf, p2_dog, p3, p3_conf, p3_dog are unnecessary as we should default to the value with the highest confidence(p1) as such drop img_num, p1_conf, p1_dog, p2, p2_conf, p2_dog, p3, p3_conf, p3_dog columns

Remediation code Quality Issue 6

In [37]:

```
IP_df_new.drop(['img_num','p1_conf', 'p1_dog', 'p2',\
                    'p2_conf', 'p2_dog', 'p3', 'p3_conf', 'p3_dog'], \
                  axis=1, inplace = True)
```

Test remediation code Quality Issue 6

In [38]:

```
#inspect dataFrame expected column value is 3
IP_df_new.shape
```

Out[38]:

```
(1532, 3)
```

Data Quality Issue 7

Define Quality Issue 7

For the Tweet Json file: some values in tweet_id are not integers (this will be the value used to join dataframes)

Remediation code Quality Issue 7

In [39]:

```
#Determine tweet_id values that are not integers,
non_int_tweet_id_index = []

for i in range(0, len(tweets_df_new.tweet_id)):
    if type(tweets_df_new.tweet_id[i]) != int:
        non_int_tweet_id_index.append(i)
print(len(non_int_tweet_id_index))
```

```
281
```

In [41]:

```
# drop rows without int values in tweet_id
for i in non_int_tweet_id_index:
    tweets_df_new.drop(tweets_df_new[tweets_df_new.index == i].index,
inplace=True)
#reset index
tweets_df_new = tweets_df_new.reset_index()
del tweets_df_new['index']
```

In [42]:

```
#reset index
tweets_df_new = tweets_df_new.reset_index()
del tweets_df_new['index']
```

Test remediation code Quality Issue 7

In [43]:

```
#confirm drop
non_int_tweet_id_index = []
for i in range(0, len(tweets_df_new.tweet_id)):
    if type(tweets_df_new.tweet_id[i]) != int:
        non_int_tweet_id_index.append(i)
print(len(non_int_tweet_id_index))
```

```
0
```

Data Quality Issue 8

Renaming unclear column headings will be addressed when the 5 dataframes are combined. see below

Additonal remidations .

1) Drop rating_numerator, rating_denominator columns 2) As they will no longer be needed drop in_reply_to_status_id, in_reply_to_user_id, retweeted_status_user_id, retweeted_status_id, retweeted_status_timestamp

In [44]:

```
# drop columns
ta_df_new.drop(['rating_numerator', 'rating_denominator','in_reply_to_status_id'
                'in_reply_to_user_id', 'retweeted_status_id', 'retweeted_status_
                'retweeted_status_timestamp'], \
                 axis=1, inplace = True)
```

In [45]:

```
#confirm drop
ta_df_new.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 8344 entries, 0 to 9367
Data columns (total 8 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   tweet_id       8344 non-null   int64  
 1   timestamp      8344 non-null   object 
 2   source         8344 non-null   object 
 3   text           8344 non-null   object 
 4   expanded_urls  8332 non-null   object 
 5   name           8344 non-null   object 
 6   Dog_type       8344 non-null   object 
 7   Rating         8344 non-null   float64
dtypes: float64(1), int64(1), object(6)
memory usage: 586.7+ KB
```

reset index

df_tweets_new = df_tweets_new.reset_index() del df_tweets_new['index']

Create master data frame

merge 3 dataframes into one master dataaframe

In [46]:
```
combo_df = pd.merge(ta_df_new, IP_df_new, on =['tweet_id'], how='left')
```

In [47]:
```
#confirm merge
combo_df.shape
```

Out[47]:
```
(8344, 10)
```

In [48]:
```
master_df = pd.merge(combo_df, tweets_df_new, on =['tweet_id'], how='left')
```

In [49]:
```
#confirm merge
master_df.shape
```

Out[49]:
```
(8344, 12)
```

Data Quality Issue 8

Define Quality Issue 8

rename unclear columular headings

Remediation code Quality Issue 8

In [50]:
```
master_df = master_df.rename(columns = {'p1':'Breed'})
```

Test remediation code Quality Issue 8

In [51]:
```
# inspect new dataframe
master_df.head()
```

Out[51]:

	tweet_id	timestamp	source	text	
0	892420643555336193	2017-08-01 16:23:56 +0000	<a href="http://twitter.com/download/iphone" r...	This is Phineas. He's a mystical boy. Only eve...	https://tw
1	892177421306343426	2017-08-01 00:17:27 +0000	<a href="http://twitter.com/download/iphone" r...	This is Tilly. She's just checking pup on you....	https://t
2	891815181378084864	2017-07-31 00:18:03 +0000	<a href="http://twitter.com/download/iphone" r...	This is Archie. He is a rare Norwegian Pouncin...	https://t

	tweet_id	timestamp	source	text	
3	891689557279858688	2017-07-30 15:58:51 +0000	<a href="http://twitter.com/download/iphone" r...	This is Darla. She commenced a snooze mid meal...	https://tv
4	891327558926688256	2017-07-29 16:00:24 +0000	<a href="http://twitter.com/download/iphone" r...	This is Franklin. He would like you to stop ca...	https://tv

In [286…

```
#export file
master_df.to_csv('/Users/michaelmohle/Desktop/D309/twitter_archive_master.csv')
```

In [ ]:

```

```

In [ ]:

```
master_df = master_df.rename(columns = {'p1':'Breed'})
```

In [52]:

```
# inspect new dataFrame
master_df.head()
```

Out[52]:

	tweet_id	timestamp	source	text	
0	892420643555336193	2017-08-01 16:23:56 +0000	<a href="http://twitter.com/download/iphone" r...	This is Phineas. He's a mystical boy. Only eve...	https://tw
1	892177421306343426	2017-08-01 00:17:27 +0000	<a href="http://twitter.com/download/iphone" r...	This is Tilly. She's just checking pup on you....	https://t
2	891815181378084864	2017-07-31 00:18:03 +0000	<a href="http://twitter.com/download/iphone" r...	This is Archie. He is a rare Norwegian Pouncin...	https://t
3	891689557279858688	2017-07-30 15:58:51 +0000	<a href="http://twitter.com/download/iphone" r...	This is Darla. She commenced a snooze mid meal...	https://tv
4	891327558926688256	2017-07-29 16:00:24 +0000	<a href="http://twitter.com/download/iphone" r...	This is Franklin. He would like you to stop ca...	https://tv

In [58]:

```
#export datafrane as part of project srtifsct
master_df.to_csv('/Users/michaelmohle/Desktop/D309/twitter_archive master.csv',
```

Vizualazations of master Dataframe to support findings

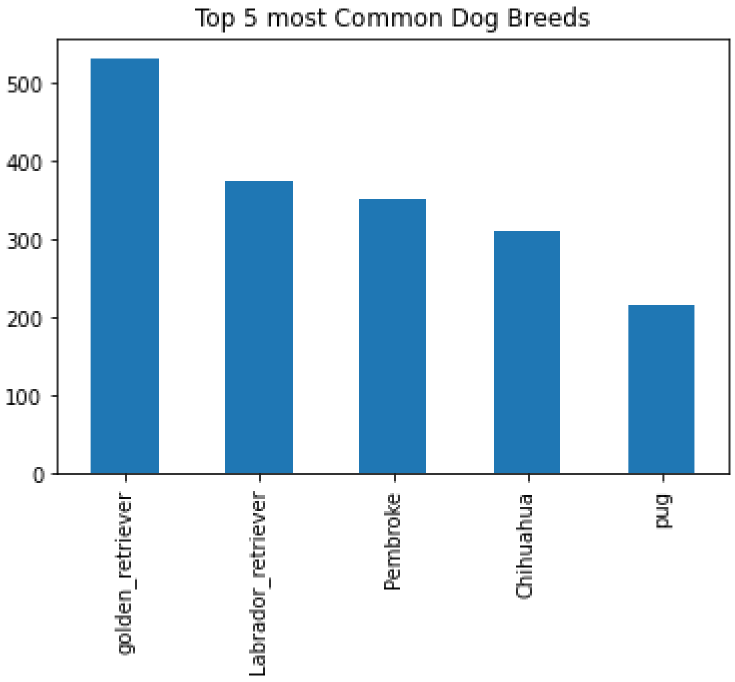
Vizualazations of Data !) most popular dog breed 2) most popular top type

In [54]:

```
# most popular dog breeds
a = master_df['Breed'].value_counts()[:5]
a.plot(kind ='bar')
plt.title("Top 5 most Common Dog Breeds")
```

Out[54]:

```
Text(0.5, 1.0, 'Top 5 most Common Dog Breeds')
```

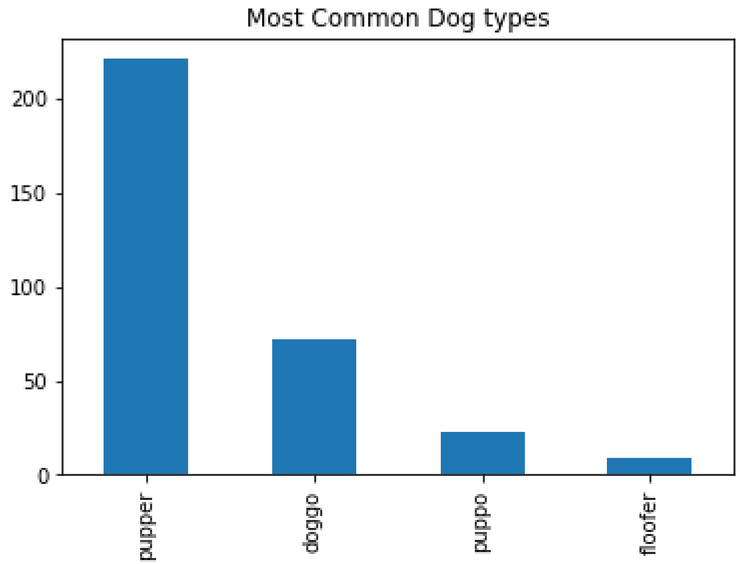


In [55]:

```
# most popular dog type
a = master_df['Dog_type'].value_counts()[1:5]
a.plot(kind ='bar')
plt.title("Most Common Dog types")
```

Out[55]:

```
Text(0.5, 1.0, 'Most Common Dog types')
```



In [77]:

```
master_df['retweet_count'].value_counts()
```

Out[77]:

```
Series([], Name: retweet_count, dtype: int64)
```

In [ ]:

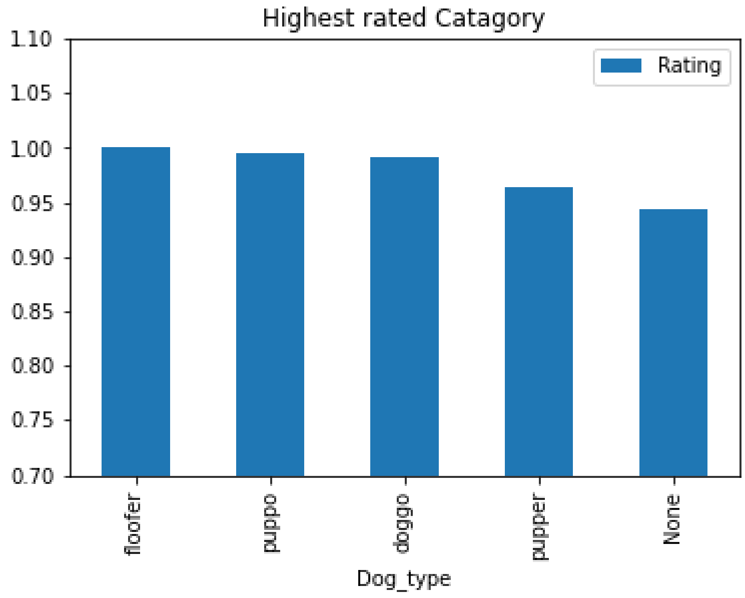
In [57]:

```
x = pd.pivot_table (master_df, index =['Dog_type'],\
                    values = ['Rating'], \
                    aggfunc = np.mean ).sort_values ('Rating',ascending=False)

x.plot(kind ='bar')
plt.ylim(.7,1.1)
plt.title("Highest rated Catagory")
```

Out[57]:

```
Text(0.5, 1.0, 'Highest rated Catagory')
```



In [ ]: