

wrangle_report

January 28, 2023

1 Project: Wrangling and Analyze Data

1.1 Data Gathering

In the cell below, gather **all** three pieces of data for this project and load them in the notebook. **Note:** the methods required to gather each data are different. 1. Directly download the WeRate-Dogs Twitter archive data (twitter_archive_enhanced.csv)

```
[49]: import pandas as pd
import requests
import os
import tweepy
import json
from timeit import default_timer as timer
from authpy import authpy
```

```
[50]: twitter_archive = pd.read_csv('twitter-archive-enhanced.csv')
```

```
[51]: twitter_archive.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

```

2. Use the Requests library to download the tweet image prediction (image_predictions.tsv)

```

[4]: url = 'https://d17h27t6h515a5.cloudfront.net/topher/2017/August/
      ↪599fd2ad_image-predictions/image-predictions.tsv'
      folder_name = '.'
      response = requests.get(url)
      with open(os.path.join(folder_name, url.split('/')[-1]), mode = 'wb') as file:
          file.write(response.content)

```

3. Use the Tweepy library to query additional data via the Twitter API (tweet_json.txt)

```

[1]: api = authpy('Project2_Cred_Twitter_API.json')

```

```

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

```

```

[17]: 2356

```

```

[28]: # 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.errors.TweepyException as e:
                  print("Fail")
                  fails_dict[tweet_id] = e
                  pass
      end = timer()
      print(end - start)
      print(fails_dict)

```

1: 892420643555336193
Success
2: 892177421306343426
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3: 891815181378084864
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4: 891689557279858688
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2034: 671744970634719232
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2035: 671743150407421952
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2036: 671735591348891648
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2042: 671542985629241344
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2043: 671538301157904385
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2045: 671533943490011136
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2046: 671528761649688577
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2048: 671518598289059840
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2049: 671511350426865664
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2050: 671504605491109889
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2051: 671497587707535361
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2052: 671488513339211776
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2065: 671154572044468225
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2066: 671151324042559489
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2075: 670842764863651840
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2076: 670840546554966016
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2077: 670838202509447168
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2079: 670832455012716544
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2084: 670811965569282048
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2089: 670792680469889025
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2092: 670783437142401025
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2093: 670782429121134593
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2094: 670780561024270336
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2098: 670733412878163972
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2104: 670676092097810432
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2105: 670668383499735048
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2106: 670474236058800128
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2113: 670435821946826752
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2120: 670417414769758208
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2121: 670411370698022913
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2122: 670408998013820928
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2124: 670385711116361728
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2125: 670374371102445568
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2126: 670361874861563904
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2127: 670338931251150849
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2128: 670319130621435904
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2131: 670093938074779648
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2133: 670079681849372674
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2134: 670073503555706880
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2135: 670069087419133954
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2139: 670040295598354432
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2140: 670037189829525505
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2141: 670003130994700288
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2142: 669993076832759809
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2143: 669972011175813120
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2144: 669970042633789440
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2145: 669942763794931712
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2146: 669926384437997569
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2147: 669923323644657664
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2148: 669753178989142016
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2149: 669749430875258880
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2150: 669684865554620416
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2151: 669683899023405056
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2153: 669680153564442624
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2154: 669661792646373376
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2155: 669625907762618368
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2156: 669603084620980224
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2157: 669597912108789760
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2159: 669573570759163904
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2160: 669571471778410496
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2161: 669567591774625800
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2162: 669564461267722241
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2163: 669393256313184256
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2164: 669375718304980992
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2165: 669371483794317312
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2166: 669367896104181761
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2167: 669363888236994561
Success
2168: 669359674819481600
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2169: 669354382627049472
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2170: 669353438988365824
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2171: 669351434509529089
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2172: 669328503091937280
Success
2173: 669327207240699904
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2174: 669324657376567296
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2175: 669216679721873412
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2176: 669214165781868544
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2177: 669203728096960512
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2178: 669037058363662336
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2179: 669015743032369152
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2180: 669006782128353280
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2181: 669000397445533696
Success
2182: 668994913074286592
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2183: 668992363537309700
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2184: 668989615043424256
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2185: 668988183816871936
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2187: 668981893510119424
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2189: 668975677807423489
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2192: 668955713004314625
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2202: 668645506898350081
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2203: 668643542311546881
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2204: 668641109086707712
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2207: 668631377374486528
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2208: 668627278264475648
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2214: 668567822092664832
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2217: 668537837512433665
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2218: 668528771708952576
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2219: 668507509523615744
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2220: 668496999348633600
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2222: 668480044826800133
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2223: 668466899341221888
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2225: 668291999406125056
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2230: 668248472370458624
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2232: 668226093875376128
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2236: 668171859951755264
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2237: 668154635664932864
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2238: 668142349051129856
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2239: 668113020489474048
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2240: 667937095915278337
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2242: 667915453470232577
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2243: 667911425562669056
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2244: 667902449697558528
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2245: 667886921285246976
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2246: 667885044254572545
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2247: 667878741721415682
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2248: 667873844930215936
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2249: 667866724293877760
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2252: 667806454573760512
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2253: 667801013445750784
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2254: 667793409583771648
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2256: 667773195014021121
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2257: 667766675769573376
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2258: 667728196545200128
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2259: 667724302356258817
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2262: 667549055577362432
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2264: 667544320556335104
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2265: 667538891197542400
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2266: 667534815156183040
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2269: 667517642048163840
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2276: 667453023279554560
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2279: 667435689202614272
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2283: 667211855547486208
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2284: 667200525029539841
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2285: 667192066997374976
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2287: 667182792070062081
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2288: 667177989038297088
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2291: 667171260800061440
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2294: 667152164079423490
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2295: 667138269671505920
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2296: 667119796878725120
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2297: 667090893657276420
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2298: 667073648344346624
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2299: 667070482143944705
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2300: 667065535570550784
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2301: 667062181243039745
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2302: 667044094246576128
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2303: 667012601033924608
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2304: 666996132027977728
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2305: 666983947667116034
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2306: 666837028449972224
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2307: 666835007768551424
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2308: 666826780179869698
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2309: 666817836334096384
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2310: 666804364988780544
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2311: 666786068205871104
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2312: 666781792255496192
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2313: 666776908487630848
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2314: 666739327293083650
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2315: 666701168228331520
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2316: 666691418707132416
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2317: 666649482315059201
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2318: 666644823164719104
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2319: 666454714377183233
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2320: 666447344410484738
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2321: 666437273139982337
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2322: 666435652385423360
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2323: 666430724426358785
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2324: 666428276349472768
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2325: 666421158376562688
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2326: 666418789513326592
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2327: 666411507551481857
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2328: 666407126856765440
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2329: 666396247373291520
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2331: 666362758909284353
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2332: 666353288456101888
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2333: 666345417576210432
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2334: 666337882303524864
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2335: 666293911632134144
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2336: 666287406224695296
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2337: 666273097616637952
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2338: 666268910803644416
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2339: 666104133288665088
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2340: 666102155909144576
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2341: 666099513787052032
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2342: 666094000022159362
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2343: 666082916733198337
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2344: 666073100786774016
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2345: 666071193221509120
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2346: 666063827256086533
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2347: 666058600524156928
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2348: 666057090499244032
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2349: 666055525042405380
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2350: 666051853826850816
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2351: 666050758794694657
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2352: 666049248165822465
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2353: 666044226329800704
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 2356: 666020888022790149
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 {888202515573088257: NotFound('404 Not Found\n144 - No status found with that ID.'), 877611172832227328: Forbidden('403 Forbidden\n179 - Sorry, you are not authorized to see this status.'), 873697596434513921: NotFound('404 Not Found\n144 - No status found with that ID.'), 872668790621863937: NotFound('404 Not Found\n144 - No status found with that ID.'), 872261713294495745: NotFound('404 Not Found\n144 - No status found with that ID.'), 869988702071779329: NotFound('404 Not Found\n144 - No status found with that ID.'), 866816280283807744: NotFound('404 Not Found\n144 - No status found with that ID.'), 861769973181624320: NotFound('404 Not Found\n144 - No status found with that ID.'), 856602993587888130: NotFound('404 Not Found\n144 - No status found with that ID.'), 856330835276025856: NotFound('404 Not Found\n144 - No status found with that ID.'), 851953902622658560: NotFound('404 Not Found\n144 - No status found with that ID.'), 851861385021730816: NotFound('404 Not Found\n144 - No status found with that ID.'), 845459076796616705: NotFound('404 Not Found\n144 - No status found with that ID.'), 844704788403113984: NotFound('404 Not Found\n144 - No status found with that ID.'), 842892208864923648: NotFound('404 Not Found\n144 - No status found with that ID.'), 842115215311396866: TweepyException("Failed to send request: HTTPSConnectionPool(host='api.twitter.com', port=443): Max retries exceeded with url: /1.1/statuses/show.json?id=842115215311396866&tweet_mode=extended (Caused by ConnectTimeoutError(<urllib3.connection.HTTPSConnection object at 0x7fb7caafa4f0>, 'Connection to api.twitter.com timed out. (connect timeout=60)'))"), 840268004936019968: TweepyException("Failed to send request: HTTPSConnectionPool(host='api.twitter.com', port=443): Max retries exceeded with url: /1.1/statuses/show.json?id=840268004936019968&tweet_mode=extended (Caused by NewConnectionError('<urllib3.connection.HTTPSConnection object at 0x7fb7ca658e80>: Failed to establish a new connection: [Errno -3] Temporary failure in name resolution'))"), 839290600511926273: Forbidden('403 Forbidden\n179 - Sorry, you are not authorized to see this status.'), 837366284874571778: NotFound('404 Not Found\n144 - No status found with that ID.'), 837012587749474308: NotFound('404 Not Found\n144 - No status found with that ID.'), 829374341691346946: NotFound('404 Not Found\n144 - No status found with that ID.'), 827228250799742977: NotFound('404 Not Found\n144 - No status found with that ID.'), 812747805718642688: NotFound('404 Not Found\n144 - No status found with that ID.'), 802247111496568832: NotFound('404 Not Found\n144 - No status found with that ID.'), 779123168116150273: NotFound('404 Not Found\n144 - No status found with that ID.'), 775096608509886464: NotFound('404 Not Found\n144 - No status found with that ID.'), 771004394259247104: Forbidden('403 Forbidden\n179 - Sorry, you are not authorized to see this

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status.'), 770743923962707968: NotFound('404 Not Found\n144 - No status found
with that ID.'), 766864461642756096: NotFound('404 Not Found\n144 - No status
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status found with that ID.'), 759566828574212096: NotFound('404 Not Found\n144 -
No status found with that ID.'), 754011816964026368: NotFound('404 Not
Found\n144 - No status found with that ID.'), 680055455951884288: NotFound('404
Not Found\n144 - No status found with that ID.'})}
```

```
[ ]: with open('tweet_json.txt', "r+") as file:
    readcontent = file.read()
    file.seek(0, 0)
    file.write("[")
    file.write(readcontent)
os.system("sed -i '$ s/$://' tweet_json.txt")
os.system("sed -i '$ s/$/}]/' tweet_json.txt")
```

```
[52]: df = pd.read_json('tweet_json.txt', orient='records')
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 2323 entries, 0 to 2322
```

```
Data columns (total 32 columns):
```

#	Column	Non-Null Count	Dtype
0	created_at	2323 non-null	datetime64[ns, UTC]
1	id	2323 non-null	int64
2	id_str	2323 non-null	int64
3	full_text	2323 non-null	object
4	truncated	2323 non-null	bool
5	display_text_range	2323 non-null	object
6	entities	2323 non-null	object
7	extended_entities	2053 non-null	object
8	source	2323 non-null	object
9	in_reply_to_status_id	77 non-null	float64
10	in_reply_to_status_id_str	77 non-null	float64
11	in_reply_to_user_id	77 non-null	float64
12	in_reply_to_user_id_str	77 non-null	float64
13	in_reply_to_screen_name	77 non-null	object
14	user	2323 non-null	object
15	geo	0 non-null	float64
16	coordinates	0 non-null	float64
17	place	1 non-null	object
18	contributors	0 non-null	float64
19	is_quote_status	2323 non-null	bool
20	retweet_count	2323 non-null	int64
21	favorite_count	2323 non-null	int64
22	favorited	2323 non-null	bool
23	retweeted	2323 non-null	bool

```

24 possibly_sensitive                2191 non-null    float64
25 possibly_sensitive_appealable     2191 non-null    float64
26 lang                             2323 non-null    object
27 retweeted_status                  158 non-null    object
28 quoted_status_id                  25 non-null     float64
29 quoted_status_id_str              25 non-null     float64
30 quoted_status_permalink           25 non-null     object
31 quoted_status                     22 non-null     object
dtypes: bool(4), datetime64[ns, UTC](1), float64(11), int64(4), object(12)
memory usage: 517.4+ KB

```

```
[521]: df_tweet = df[['id', 'retweet_count', 'favorite_count']]
df_tweet.head()
```

```
[521]:
```

	id	retweet_count	favorite_count
0	892420643555336193	6859	32856
1	892177421306343426	5169	28380
2	891815181378084864	3410	21329
3	891689557279858688	7072	35814
4	891327558926688256	7576	34244

```
[522]: img_prediction = pd.read_table('image-predictions.tsv')
img_prediction.sample(5)
```

```
[522]:
```

	tweet_id	jpg_url \
360	672640509974827008	https://pbs.twimg.com/media/CVWy9v-VAAALSoE.jpg
1434	773670353721753600	https://pbs.twimg.com/media/CryhFC0XEAA9wp.jpg
1149	731285275100512256	https://pbs.twimg.com/media/CiYME3tVAAENz99.jpg
1312	754482103782404096	https://pbs.twimg.com/ext_tw_video_thumb/75448...
414	674008982932058114	https://pbs.twimg.com/media/CVqPkVoU4AAkXA7.jpg

	img_num	p1	p1_conf	p1_dog	p2 \
360	1	Chesapeake_Bay_retriever	0.420155	True	Cardigan
1434	1	Old_English_sheepdog	0.969311	True	Maltese_dog
1149	1	Pembroke	0.967103	True	Cardigan
1312	1	tub	0.596796	False	bathtub
414	1	jigsaw_puzzle	0.970810	False	prayer_rug

	p2_conf	p2_dog	p3	p3_conf	p3_dog
360	0.266030	True	Labrador_retriever	0.042514	True
1434	0.013243	True	soft-coated_wheaten_terrier	0.004857	True
1149	0.021126	True	Chihuahua	0.002231	True
1312	0.381098	False	shower_curtain	0.017629	False
414	0.011048	False	quill	0.008432	False

1.2 Assessing Data

In this section, detect and document at least **eight (8) quality issues** and **two (2) tidiness issue**. You must use **both** visual assessment and programmatic assessment to assess the data.

Note: pay attention to the following key points when you access the data.

- You only want original ratings (no retweets) that have images. Though there are 5000+ tweets in the dataset, not all are dog ratings and some are retweets.
- Assessing and cleaning the entire dataset completely would require a lot of time, and is not necessary to practice and demonstrate your skills in data wrangling. Therefore, the requirements of this project are only to assess and clean at least 8 quality issues and at least 2 tidiness issues in this dataset.
- The fact that the rating numerators are greater than the denominators does not need to be cleaned. This [unique rating system](#) is a big part of the popularity of WeRateDogs.
- You do not need to gather the tweets beyond August 1st, 2017. You can, but note that you won't be able to gather the image predictions for these tweets since you don't have access to the algorithm used.

```
[55]: img_prediction.img_num.value_counts()
```

```
[55]: 1    1780
      2    198
      3     66
      4     31
      Name: img_num, dtype: int64
```

```
[56]: img_prediction.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
```



```
[57]: twitter_archive.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
```

```
[58]: twitter_archive.sample(5)
```

```
[58]:      tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
997   748324050481647620                NaN                NaN
2342   666082916733198337                NaN                NaN
1891   674764817387900928                NaN                NaN
1088   737826014890496000                NaN                NaN
1878   675047298674663426                NaN                NaN

      timestamp  \
997   2016-06-30 01:15:31 +0000
2342   2015-11-16 02:38:37 +0000
1891   2015-12-10 01:37:23 +0000
1088   2016-06-01 02:00:04 +0000
1878   2015-12-10 20:19:52 +0000

      source  \
997   <a href="http://twitter.com/download/iphone" r...
2342   <a href="http://twitter.com/download/iphone" r...
1891   <a href="http://twitter.com/download/iphone" r...
```

```
1088 <a href="http://twitter.com/download/iphone" r...
1878 <a href="http://twitter.com/download/iphone" r...
```

	text	retweeted_status_id \
997	This is Duke. He permanently looks like he jus...	NaN
2342	Here we have a well-established sunblockerspan...	NaN
1891	These two pups are masters of camouflage. Very...	NaN
1088	This is Remy. He has some long ass ears (proba...	NaN
1878	This is a fluffy albino Bacardi Columbia mix. ...	NaN

	retweeted_status_user_id	retweeted_status_timestamp \
997	NaN	NaN
2342	NaN	NaN
1891	NaN	NaN
1088	NaN	NaN
1878	NaN	NaN

	expanded_urls	rating_numerator \
997	https://twitter.com/dog_rates/status/748324050...	11
2342	https://twitter.com/dog_rates/status/666082916...	6
1891	https://twitter.com/dog_rates/status/674764817...	10
1088	https://twitter.com/dog_rates/status/737826014...	10
1878	https://twitter.com/dog_rates/status/675047298...	11

	rating_denominator	name	doggo	floofer	pupper	puppo
997	10	Duke	None	None	None	None
2342	10	None	None	None	None	None
1891	10	None	None	None	None	None
1088	10	Remy	None	None	None	None
1878	10	a	None	None	None	None

```
[59]: twitter_archive[twitter_archive['expanded_urls'].isnull()]
```

```
[59]:
```

	tweet_id	in_reply_to_status_id	in_reply_to_user_id \
30	886267009285017600	8.862664e+17	2.281182e+09
55	881633300179243008	8.816070e+17	4.738443e+07
64	879674319642796034	8.795538e+17	3.105441e+09
113	870726314365509632	8.707262e+17	1.648776e+07
148	863427515083354112	8.634256e+17	7.759620e+07
179	857214891891077121	8.571567e+17	1.806710e+08
185	856330835276025856	NaN	NaN
186	856288084350160898	8.562860e+17	2.792810e+08
188	855862651834028034	8.558616e+17	1.943518e+08
189	855860136149123072	8.558585e+17	1.361572e+07
218	850333567704068097	8.503288e+17	2.195506e+07
228	848213670039564288	8.482121e+17	4.196984e+09
234	847617282490613760	8.476062e+17	4.196984e+09

274	840698636975636481	8.406983e+17	8.405479e+17
290	838150277551247360	8.381455e+17	2.195506e+07
291	838085839343206401	8.380855e+17	2.894131e+09
313	835246439529840640	8.352460e+17	2.625958e+07
342	832088576586297345	8.320875e+17	3.058208e+07
346	831926988323639298	8.319030e+17	2.068372e+07
375	828361771580813312	NaN	NaN
387	826598799820865537	8.265984e+17	4.196984e+09
409	823333489516937216	8.233264e+17	1.582854e+09
427	821153421864615936	8.211526e+17	1.132119e+08
498	813130366689148928	8.131273e+17	4.196984e+09
513	811647686436880384	8.116272e+17	4.196984e+09
570	801854953262350336	8.018543e+17	1.185634e+07
576	800859414831898624	8.008580e+17	2.918590e+08
611	797165961484890113	7.971238e+17	2.916630e+07
701	786051337297522688	7.727430e+17	7.305050e+17
707	785515384317313025	NaN	NaN
843	766714921925144576	7.667118e+17	4.196984e+09
857	763956972077010945	7.638652e+17	1.584641e+07
967	750381685133418496	7.501805e+17	4.717297e+09
1005	747651430853525504	7.476487e+17	4.196984e+09
1080	738891149612572673	7.384119e+17	3.589728e+08
1295	707983188426153984	7.079801e+17	2.319108e+09
1345	704491224099647488	7.044857e+17	2.878549e+07
1445	696518437233913856	NaN	NaN
1446	696490539101908992	6.964887e+17	4.196984e+09
1474	693644216740769793	6.936422e+17	4.196984e+09
1479	693582294167244802	6.935722e+17	1.198989e+09
1497	692423280028966913	6.924173e+17	4.196984e+09
1523	690607260360429569	6.903413e+17	4.670367e+08
1598	686035780142297088	6.860340e+17	4.196984e+09
1605	685681090388975616	6.855479e+17	4.196984e+09
1618	684969860808454144	6.849598e+17	4.196984e+09
1663	682808988178739200	6.827884e+17	4.196984e+09
1689	681340665377193984	6.813394e+17	4.196984e+09
1774	678023323247357953	6.780211e+17	4.196984e+09
1819	676590572941893632	6.765883e+17	4.196984e+09
1844	675849018447167488	6.758457e+17	4.196984e+09
1895	674742531037511680	6.747400e+17	4.196984e+09
1905	674606911342424069	6.744689e+17	4.196984e+09
1914	674330906434379776	6.658147e+17	1.637468e+07
1940	673716320723169284	6.737159e+17	4.196984e+09
2038	671550332464455680	6.715449e+17	4.196984e+09
2149	669684865554620416	6.693544e+17	4.196984e+09
2189	668967877119254528	6.689207e+17	2.143566e+07
2298	667070482143944705	6.670655e+17	4.196984e+09

		timestamp	\
30	2017-07-15	16:51:35	+0000
55	2017-07-02	21:58:53	+0000
64	2017-06-27	12:14:36	+0000
113	2017-06-02	19:38:25	+0000
148	2017-05-13	16:15:35	+0000
179	2017-04-26	12:48:51	+0000
185	2017-04-24	02:15:55	+0000
186	2017-04-23	23:26:03	+0000
188	2017-04-22	19:15:32	+0000
189	2017-04-22	19:05:32	+0000
218	2017-04-07	13:04:55	+0000
228	2017-04-01	16:41:12	+0000
234	2017-03-31	01:11:22	+0000
274	2017-03-11	22:59:09	+0000
290	2017-03-04	22:12:52	+0000
291	2017-03-04	17:56:49	+0000
313	2017-02-24	21:54:03	+0000
342	2017-02-16	04:45:50	+0000
346	2017-02-15	18:03:45	+0000
375	2017-02-05	21:56:51	+0000
387	2017-02-01	01:11:25	+0000
409	2017-01-23	00:56:15	+0000
427	2017-01-17	00:33:26	+0000
498	2016-12-25	21:12:41	+0000
513	2016-12-21	19:01:02	+0000
570	2016-11-24	18:28:13	+0000
576	2016-11-22	00:32:18	+0000
611	2016-11-11	19:55:50	+0000
701	2016-10-12	03:50:17	+0000
707	2016-10-10	16:20:36	+0000
843	2016-08-19	19:14:16	+0000
857	2016-08-12	04:35:10	+0000
967	2016-07-05	17:31:49	+0000
1005	2016-06-28	04:42:46	+0000
1080	2016-06-04	00:32:32	+0000
1295	2016-03-10	17:35:20	+0000
1345	2016-03-01	02:19:31	+0000
1445	2016-02-08	02:18:30	+0000
1446	2016-02-08	00:27:39	+0000
1474	2016-01-31	03:57:23	+0000
1479	2016-01-30	23:51:19	+0000
1497	2016-01-27	19:05:49	+0000
1523	2016-01-22	18:49:36	+0000
1598	2016-01-10	04:04:10	+0000
1605	2016-01-09	04:34:45	+0000
1618	2016-01-07	05:28:35	+0000

1663 2016-01-01 06:22:03 +0000
 1689 2015-12-28 05:07:27 +0000
 1774 2015-12-19 01:25:31 +0000
 1819 2015-12-15 02:32:17 +0000
 1844 2015-12-13 01:25:37 +0000
 1895 2015-12-10 00:08:50 +0000
 1905 2015-12-09 15:09:55 +0000
 1914 2015-12-08 20:53:11 +0000
 1940 2015-12-07 04:11:02 +0000
 2038 2015-12-01 04:44:10 +0000
 2149 2015-11-26 01:11:28 +0000
 2189 2015-11-24 01:42:25 +0000
 2298 2015-11-18 20:02:51 +0000

source \

30 <a href="http://twitter.com/download/iphone" r...
 55 <a href="http://twitter.com/download/iphone" r...
 64 <a href="http://twitter.com/download/iphone" r...
 113 <a href="http://twitter.com/download/iphone" r...
 148 <a href="http://twitter.com/download/iphone" r...
 179 <a href="http://twitter.com/download/iphone" r...
 185 <a href="http://twitter.com/download/iphone" r...
 186 <a href="http://twitter.com/download/iphone" r...
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 228 <a href="http://twitter.com/download/iphone" r...
 234 <a href="http://twitter.com/download/iphone" r...
 274 <a href="http://twitter.com/download/iphone" r...
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 342 <a href="http://twitter.com/download/iphone" r...
 346 <a href="http://twitter.com/download/iphone" r...
 375 Tw...
 387 <a href="http://twitter.com/download/iphone" r...
 409 <a href="http://twitter.com/download/iphone" r...
 427 <a href="http://twitter.com/download/iphone" r...
 498 <a href="http://twitter.com/download/iphone" r...
 513 <a href="http://twitter.com/download/iphone" r...
 570 <a href="http://twitter.com/download/iphone" r...
 576 <a href="http://twitter.com/download/iphone" r...
 611 <a href="http://twitter.com/download/iphone" r...
 701 <a href="http://twitter.com/download/iphone" r...
 707 <a href="http://twitter.com/download/iphone" r...
 843 <a href="http://twitter.com/download/iphone" r...
 857 <a href="http://twitter.com/download/iphone" r...

967 <a href="http://twitter.com/download/iphone" r...
 1005 <a href="http://twitter.com/download/iphone" r...
 1080 <a href="http://twitter.com/download/iphone" r...
 1295 <a href="http://twitter.com/download/iphone" r...
 1345 <a href="http://twitter.com/download/iphone" r...
 1445 <a href="http://twitter.com/download/iphone" r...
 1446 <a href="http://twitter.com/download/iphone" r...
 1474 <a href="http://twitter.com/download/iphone" r...
 1479 <a href="http://twitter.com/download/iphone" r...
 1497 <a href="http://twitter.com/download/iphone" r...
 1523 <a href="http://twitter.com/download/iphone" r...
 1598 <a href="http://twitter.com/download/iphone" r...
 1605 <a href="http://twitter.com/download/iphone" r...
 1618 <a href="http://twitter.com/download/iphone" r...
 1663 <a href="http://twitter.com/download/iphone" r...
 1689 <a href="http://twitter.com/download/iphone" r...
 1774 <a href="http://twitter.com/download/iphone" r...
 1819 <a href="http://twitter.com/download/iphone" r...
 1844 <a href="http://twitter.com/download/iphone" r...
 1895 <a href="http://twitter.com/download/iphone" r...
 1905 <a href="http://twitter.com/download/iphone" r...
 1914 <a href="http://twitter.com/download/iphone" r...
 1940 <a href="http://twitter.com/download/iphone" r...
 2038 <a href="http://twitter.com/download/iphone" r...
 2149 <a href="http://twitter.com/download/iphone" r...
 2189 <a href="http://twitter.com/download/iphone" r...
 2298 <a href="http://twitter.com/download/iphone" r...

	text	retweeted_status_id \
30	@NonWhiteHat @MayhewMayhem omg hello tanner yo...	NaN
55	@roushfenway These are good dogs but 17/10 is ...	NaN
64	@RealKentMurphy 14/10 confirmed	NaN
113	@ComplicitOwl @ShopWeRateDogs >10/10 is res...	NaN
148	@Jack_Septic_Eye I'd need a few more pics to p...	NaN
179	@Marc_IRL pixelated af 12/10	NaN
185	RT @Jenna_Marbles: @dog_rates Thanks for ratin...	8.563302e+17
186	@xianmcguire @Jenna_Marbles Kardashians wouldn...	NaN
188	@dhmontgomery We also gave snoop dogg a 420/10...	NaN
189	@s8n You tried very hard to portray this good ...	NaN
218	@markhoppus MARK THAT DOG HAS SEEN AND EXPERIE...	NaN
228	Jerry just apuppologized to me. He said there ...	NaN
234	.@breaannanicolee PUPDATE: Cannon has a heart ...	NaN
274	@0_kelvin_0 >10/10 is reserved for puppos s...	NaN
290	@markhoppus 182/10	NaN
291	@bragg6of8 @Andy_Pace_ we are still looking fo...	NaN
313	@jonnyysun @Lin_Manuel ok jomny I know you're e...	NaN
342	@docmisterio account started on 11/15/15	NaN

346	@UNC can confirm 12/10	NaN
375	Beebop and Doobert should start a band 12/10 w...	NaN
387	I was going to do 007/10, but the joke wasn't ...	NaN
409	@HistoryInPics 13/10	NaN
427	@imgur for a polar bear tho I'd say 13/10 is a...	NaN
498	I've been informed by multiple sources that th...	NaN
513	PUPDATE: I've been informed that Augie was act...	NaN
570	.@NBCSports OMG THE TINY HAT I'M GOING TO HAVE...	NaN
576	@SkyWilliams doggo simply protecting you from ...	NaN
611	@JODYHIGHROLLER it may be an 11/10 but what do...	NaN
701	13/10 for breakdancing puppo @shibbnbot	NaN
707	Today, 10/10, should be National Dog Rates Day	NaN
843	His name is Charley and he already has a new s...	NaN
857	@TheEllenShow I'm not sure if you know this bu...	NaN
967	13/10 such a good doggo\n@spaghamily	NaN
1005	Other pupper asked not to have his identity sh...	NaN
1080	@mount_alex3 13/10	NaN
1295	@serial @MrRoles OH MY GOD I listened to all o...	NaN
1345	13/10 hero af\n@ABC	NaN
1445	Oh my god 10/10 for every little hot dog pupper	NaN
1446	After reading the comments I may have overesti...	NaN
1474	BREAKING PUPDATE: I've just been notified that...	NaN
1479	Personally I'd give him an 11/10. Not sure why...	NaN
1497	PUPDATE: just noticed this dog has some extra ...	NaN
1523	12/10 @LightningHoltt	NaN
1598	Yes I do realize a rating of 4/20 would've bee...	NaN
1605	Jack deserves another round of applause. If yo...	NaN
1618	For those who claim this is a goat, u are wron...	NaN
1663	I'm aware that I could've said 20/16, but here...	NaN
1689	I've been told there's a slight possibility he...	NaN
1774	After getting lost in Reese's eyes for several...	NaN
1819	After some outrage from the crowd. Bubbles is ...	NaN
1844	This dog is being demoted to a 9/10 for not we...	NaN
1895	Some clarification is required. The dog is sin...	NaN
1905	The 13/10 also takes into account this impecca...	NaN
1914	13/10\n@ABC7	NaN
1940	The millennials have spoken and we've decided ...	NaN
2038	After 22 minutes of careful deliberation this ...	NaN
2149	After countless hours of research and hundreds...	NaN
2189	12/10 good shit Bubka\n@wane15	NaN
2298	After much debate this dog is being upgraded t...	NaN

	retweeted_status_user_id	retweeted_status_timestamp	expanded_urls	\
30	NaN	NaN	NaN	
55	NaN	NaN	NaN	
64	NaN	NaN	NaN	
113	NaN	NaN	NaN	

148	NaN	NaN	NaN
179	NaN	NaN	NaN
185	66699013.0	2017-04-24 02:13:14 +0000	NaN
186	NaN	NaN	NaN
188	NaN	NaN	NaN
189	NaN	NaN	NaN
218	NaN	NaN	NaN
228	NaN	NaN	NaN
234	NaN	NaN	NaN
274	NaN	NaN	NaN
290	NaN	NaN	NaN
291	NaN	NaN	NaN
313	NaN	NaN	NaN
342	NaN	NaN	NaN
346	NaN	NaN	NaN
375	NaN	NaN	NaN
387	NaN	NaN	NaN
409	NaN	NaN	NaN
427	NaN	NaN	NaN
498	NaN	NaN	NaN
513	NaN	NaN	NaN
570	NaN	NaN	NaN
576	NaN	NaN	NaN
611	NaN	NaN	NaN
701	NaN	NaN	NaN
707	NaN	NaN	NaN
843	NaN	NaN	NaN
857	NaN	NaN	NaN
967	NaN	NaN	NaN
1005	NaN	NaN	NaN
1080	NaN	NaN	NaN
1295	NaN	NaN	NaN
1345	NaN	NaN	NaN
1445	NaN	NaN	NaN
1446	NaN	NaN	NaN
1474	NaN	NaN	NaN
1479	NaN	NaN	NaN
1497	NaN	NaN	NaN
1523	NaN	NaN	NaN
1598	NaN	NaN	NaN
1605	NaN	NaN	NaN
1618	NaN	NaN	NaN
1663	NaN	NaN	NaN
1689	NaN	NaN	NaN
1774	NaN	NaN	NaN
1819	NaN	NaN	NaN
1844	NaN	NaN	NaN

1895	NaN	NaN	NaN
1905	NaN	NaN	NaN
1914	NaN	NaN	NaN
1940	NaN	NaN	NaN
2038	NaN	NaN	NaN
2149	NaN	NaN	NaN
2189	NaN	NaN	NaN
2298	NaN	NaN	NaN

	rating_numerator	rating_denominator	name	doggo	floofer	pupper	puppo
30	12	10	None	None	None	None	None
55	17	10	None	None	None	None	None
64	14	10	None	None	None	None	None
113	10	10	None	None	None	None	None
148	12	10	None	None	None	None	None
179	12	10	None	None	None	None	None
185	14	10	None	None	None	None	None
186	14	10	None	None	None	None	None
188	420	10	None	None	None	None	None
189	666	10	None	None	None	None	None
218	13	10	None	None	None	None	None
228	11	10	None	None	None	None	None
234	13	10	None	None	None	None	None
274	10	10	None	None	None	None	None
290	182	10	None	None	None	None	None
291	15	10	None	None	None	None	None
313	960	0	None	None	None	None	None
342	11	15	None	None	None	None	None
346	12	10	None	None	None	None	None
375	12	10	None	None	None	None	None
387	7	10	None	None	None	None	None
409	13	10	None	None	None	None	None
427	13	10	None	None	None	None	None
498	12	10	None	None	None	None	None
513	11	10	None	None	None	None	None
570	11	10	None	None	None	None	None
576	11	10	None	doggo	None	None	None
611	11	10	None	None	None	None	None
701	13	10	None	None	None	None	puppo
707	10	10	None	None	None	None	None
843	13	10	None	None	None	None	None
857	12	10	None	doggo	None	None	None
967	13	10	None	doggo	None	None	None
1005	12	10	None	None	None	pupper	None
1080	13	10	None	None	None	None	None
1295	12	10	None	None	None	None	None
1345	13	10	None	None	None	None	None

1445	10	10	None	None	None	pupper	None
1446	1	10	None	None	None	None	None
1474	10	10	None	None	None	None	None
1479	11	10	None	None	None	None	None
1497	9	10	None	None	None	None	None
1523	12	10	None	None	None	None	None
1598	4	20	None	None	None	None	None
1605	14	10	None	None	None	None	None
1618	5	10	None	None	None	None	None
1663	20	16	None	None	None	None	None
1689	5	10	None	None	None	None	None
1774	13	10	None	None	None	None	None
1819	7	10	None	None	None	None	None
1844	9	10	None	None	None	None	None
1895	11	10	None	None	None	None	None
1905	13	10	None	None	None	None	None
1914	13	10	None	None	None	None	None
1940	1	10	None	None	None	None	None
2038	1	10	None	None	None	None	None
2149	11	10	None	None	None	None	None
2189	12	10	None	None	None	None	None
2298	10	10	None	None	None	None	None

```
[60]: twitter_archive[twitter_archive['in_reply_to_status_id'] == 6.715449e+17]
```

```
[60]: Empty DataFrame
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp,
source, text, retweeted_status_id, retweeted_status_user_id,
retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator,
name, doggo, floofer, pupper, puppo]
Index: []
```

```
[61]: twitter_archive['in_reply_to_status_id'].value_counts()
```

```
[61]: 6.671522e+17    2
6.715449e+17    1
7.030419e+17    1
6.747400e+17    1
8.116272e+17    1
..
7.384119e+17    1
7.638652e+17    1
7.476487e+17    1
6.758457e+17    1
6.706684e+17    1
Name: in_reply_to_status_id, Length: 77, dtype: int64
```

```
[62]: twitter_archive[twitter_archive.tweet_id.duplicated()]
```

```
[62]: Empty DataFrame
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp,
source, text, retweeted_status_id, retweeted_status_user_id,
retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator,
name, doggo, floofer, pupper, puppo]
Index: []
```

```
[63]: twitter_archive[twitter_archive.name.duplicated()]
```

```
[63]:
```

	tweet_id	in_reply_to_status_id	in_reply_to_user_id	\
7	890729181411237888	NaN	NaN	
12	889665388333682689	NaN	NaN	
23	887473957103951883	NaN	NaN	
24	887343217045368832	NaN	NaN	
25	887101392804085760	NaN	NaN	
...	
2351	666049248165822465	NaN	NaN	
2352	666044226329800704	NaN	NaN	
2353	666033412701032449	NaN	NaN	
2354	666029285002620928	NaN	NaN	
2355	666020888022790149	NaN	NaN	

	timestamp	\
7	2017-07-28 00:22:40 +0000	
12	2017-07-25 01:55:32 +0000	
23	2017-07-19 00:47:34 +0000	
24	2017-07-18 16:08:03 +0000	
25	2017-07-18 00:07:08 +0000	
...	...	
2351	2015-11-16 00:24:50 +0000	
2352	2015-11-16 00:04:52 +0000	
2353	2015-11-15 23:21:54 +0000	
2354	2015-11-15 23:05:30 +0000	
2355	2015-11-15 22:32:08 +0000	

	source	\
7	<a href="http://twitter.com/download/iphone" r...	
12	<a href="http://twitter.com/download/iphone" r...	
23	<a href="http://twitter.com/download/iphone" r...	
24	<a href="http://twitter.com/download/iphone" r...	
25	<a href="http://twitter.com/download/iphone" r...	
...	...	
2351	<a href="http://twitter.com/download/iphone" r...	
2352	<a href="http://twitter.com/download/iphone" r...	
2353	<a href="http://twitter.com/download/iphone" r...	

2354 <a href="http://twitter.com/download/iphone" r...
 2355 <a href="http://twitter.com/download/iphone" r...

	text	retweeted_status_id \
7	When you watch your owner call another dog a g...	NaN
12	Here's a puppo that seems to be on the fence a...	NaN
23	This is Canela. She attempted some fancy porch...	NaN
24	You may not have known you needed to see this ...	NaN
25	This... is a Jubilant Antarctic House Bear. We...	NaN
...
2351	Here we have a 1949 1st generation vulpix. Enj...	NaN
2352	This is a purebred Piers Morgan. Loves to Netf...	NaN
2353	Here is a very happy pup. Big fan of well-main...	NaN
2354	This is a western brown Mitsubishi terrier. Up...	NaN
2355	Here we have a Japanese Irish Setter. Lost eye...	NaN

	retweeted_status_user_id	retweeted_status_timestamp \
7	NaN	NaN
12	NaN	NaN
23	NaN	NaN
24	NaN	NaN
25	NaN	NaN
...
2351	NaN	NaN
2352	NaN	NaN
2353	NaN	NaN
2354	NaN	NaN
2355	NaN	NaN

	expanded_urls	rating_numerator \
7	https://twitter.com/dog_rates/status/890729181...	13
12	https://twitter.com/dog_rates/status/889665388...	13
23	https://twitter.com/dog_rates/status/887473957...	13
24	https://twitter.com/dog_rates/status/887343217...	13
25	https://twitter.com/dog_rates/status/887101392...	12
...
2351	https://twitter.com/dog_rates/status/666049248...	5
2352	https://twitter.com/dog_rates/status/666044226...	6
2353	https://twitter.com/dog_rates/status/666033412...	9
2354	https://twitter.com/dog_rates/status/666029285...	7
2355	https://twitter.com/dog_rates/status/666020888...	8

	rating_denominator	name	doggo	floofer	pupper	puppo
7	10	None	None	None	None	None
12	10	None	None	None	None	puppo
23	10	Canela	None	None	None	None
24	10	None	None	None	None	None

25	10	None	None	None	None	None
...
2351	10	None	None	None	None	None
2352	10	a	None	None	None	None
2353	10	a	None	None	None	None
2354	10	a	None	None	None	None
2355	10	None	None	None	None	None

[1399 rows x 17 columns]

```
[64]: twitter_archive[twitter_archive.tweet_id == 8.406323e+17]
```

[64]: Empty DataFrame

Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp, source, text, retweeted_status_id, retweeted_status_user_id, retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator, name, doggo, floofer, pupper, puppo]
Index: []

```
[65]: twitter_archive[twitter_archive.name == 'Baloo']
```

```
[65]:
```

	tweet_id	in_reply_to_status_id	in_reply_to_user_id	\
594	798705661114773508	NaN	NaN	
1067	740676976021798912	NaN	NaN	

	timestamp	\
594	2016-11-16 01:54:03 +0000	
1067	2016-06-08 22:48:46 +0000	

	source	\
594	<a href="http://twitter.com/download/iphone" r...	
1067	<a href="http://twitter.com/download/iphone" r...	

	text	retweeted_status_id	\
594	RT @dog_rates: Meet Baloo. He's expecting a fa...	7.406770e+17	
1067	Meet Baloo. He's expecting a fast ground ball,...	NaN	

	retweeted_status_user_id	retweeted_status_timestamp	\
594	4.196984e+09	2016-06-08 22:48:46 +0000	
1067	NaN	NaN	

	expanded_urls	rating_numerator	\
594	https://twitter.com/dog_rates/status/740676976...	11	
1067	https://twitter.com/dog_rates/status/740676976...	11	

	rating_denominator	name	doggo	floofer	pupper	puppo
594	10	Baloo	None	None	pupper	None

```
1067          10 Baloo None None pupper None
```

```
[66]: twitter_archive[twitter_archive.tweet_id == 698710712454139905].source
```

```
[66]: 1414      <a href="http://twitter.com/download/iphone" r...
      Name: source, dtype: object
```

```
[67]: twitter_archive.source.value_counts()
```

```
[67]: <a href="http://twitter.com/download/iphone" rel="nofollow">Twitter for
      iPhone</a>      2221
      <a href="http://vine.co" rel="nofollow">Vine - Make a Scene</a>
      91
      <a href="http://twitter.com" rel="nofollow">Twitter Web Client</a>
      33
      <a href="https://about.twitter.com/products/tweetdeck"
      rel="nofollow">TweetDeck</a>      11
      Name: source, dtype: int64
```

```
[68]: twitter_archive[['rating_numerator', 'name', 'doggo', 'floofer', 'pupper',
      ↪ 'puppo']].sample(5)
```

```
[68]:      rating_numerator      name doggo floofer pupper puppo
1263              11      None  None      None pupper  None
1576              10  Kramer  None      None      None  None
1074              12   Simba  None      None      None  None
123               14  Walter  None      None      None  None
303               13   Buddy  None      None      None  None
```

```
[147]: twitter_archive['doggo'].value_counts()
```

```
[147]: None      2259
      doggo      97
      Name: doggo, dtype: int64
```

```
[148]: twitter_archive['floofer'].value_counts()
```

```
[148]: None      2346
      floofer      10
      Name: floofer, dtype: int64
```

```
[150]: twitter_archive['pupper'].value_counts()
```

```
[150]: None      2099
      pupper      257
      Name: pupper, dtype: int64
```

```
[149]: twitter_archive['puppo'].value_counts()
```

```
[149]: None      2326  
      puppo      30  
      Name: puppo, dtype: int64
```

```
[239]: twitter_archive['tweet_id'].count()
```

```
[239]: 2356
```

```
[240]: img_prediction['tweet_id'].count()
```

```
[240]: 2075
```

```
[241]: df_tweet['id'].count()
```

```
[241]: 2323
```

```
[69]: df_tweet.sample(5)
```

```
[69]:
```

		id	retweet_count	favorite_count
143	863062471531167744		2040	7303
1316	704347321748819968		305	1407
1225	710296729921429505		657	2139
1265	707776935007539200		851	2933
2093	670338931251150849		96	366

```
[70]: df_tweet[ df_tweet.id.duplicated()]
```

```
[70]: Empty DataFrame  
      Columns: [id, retweet_count, favorite_count]  
      Index: []
```

```
[71]: df_tweet.info()
```

```
<class 'pandas.core.frame.DataFrame'>  
RangeIndex: 2323 entries, 0 to 2322  
Data columns (total 3 columns):  
#   Column          Non-Null Count  Dtype  
---  -----  
0   id              2323 non-null   int64  
1   retweet_count   2323 non-null   int64  
2   favorite_count  2323 non-null   int64  
dtypes: int64(3)  
memory usage: 54.6 KB
```

```
[72]: all_columns = pd.Series(list(twitter_archive) + list(img_prediction) +
    ↳ list(df_tweet))
    all_columns[all_columns.duplicated()]
```

```
[72]: 17    tweet_id
    dtype: object
```

1.2.1 Quality issues

1. tweeter_archive table - NaN (Null) values in in_reply_to_status_id, in_reply_to_user_id, retweeted_status_user_id, retweeted_status_id, retweeted_status_timestamp, expanded_urls columns
2. tweeter_archive table - Null values replaced by None in doggo, floofer, pupper, puppo; name column sometimes has value 'a'
3. tweeter_archive table - timestamp and retweeted_status_timestamp columns are object(string) type not datetime
4. tweeter_archive, df_tweet tables - some tweet_id has no image in img_prediction table
5. tweeter_archive table - in_reply_to_status_id, in_reply_to_user_id, retweeted_status_user_id, retweeted_status_id columns have float type instead of int(tweet_id column has int type)
6. img_prediction table - for image number 4, there is no properties(p4, p4_conf, p4_dog)
7. tweeter_archive table - doggo, floofer, pupper, puppo have not None values equal to name of their corresponding column; So normally, these columns are booleans
8. img_prediction table - some tweet_id have not a dog img (p1_dog, p2_dog, p3_dog are False)

1.2.2 Tidiness issues

1. tweet_id column(which is in img_prediction table) is duplicated in df_tweet
2. twitter_archive table - the dog_stage variable is hidden in column headers: doggo, floofer, pupper, puppo

1.3 Cleaning Data

In this section, clean **all** of the issues you documented while assessing.

Note: Make a copy of the original data before cleaning. Cleaning includes merging individual pieces of data according to the rules of [tidy data](#). The result should be a high-quality and tidy master pandas DataFrame (or DataFrames, if appropriate).

```
[523]: # Make copies of original pieces of data
    twitter_archive_clean = twitter_archive.copy()
    img_prediction_clean = img_prediction.copy()
    df_tweet_clean = df_tweet.copy()
```


1.3.1 Issue #1:

tweeter_archive: NaN (Null) values in in_reply_to_status_id, in_reply_to_user_id, retweeted_status_user_id, retweeted_status_id, retweeted_status_timestamp, expanded_urls columns

Define: Drop rows where expanded_urls misses, replace all missing id by 0, replace missing retweeted_status_timestamp values by 2099-12-31 00:00:00 +0000

Code

```
[524]: twitter_archive_clean =  
        ↪twitter_archive_clean[twitter_archive_clean['expanded_urls'].notna()]
```

```
[525]: twitter_archive_clean['retweeted_status_id'].fillna(0, inplace=True)  
        twitter_archive_clean['retweeted_status_user_id'].fillna(0, inplace=True)  
        twitter_archive_clean['retweeted_status_timestamp'].fillna('2099-12-31 00:00:00_  
        ↪+0000', inplace=True)  
        twitter_archive_clean['in_reply_to_status_id'].fillna(0, inplace=True)  
        twitter_archive_clean['in_reply_to_user_id'].fillna(0, inplace=True)
```

Test

```
[526]: twitter_archive_clean[twitter_archive_clean['expanded_urls'].isnull()]
```

```
[526]: Empty DataFrame  
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp,  
source, text, retweeted_status_id, retweeted_status_user_id,  
retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator,  
name, doggo, floofer, pupper, puppo]  
Index: []
```

```
[527]: twitter_archive_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
Int64Index: 2297 entries, 0 to 2355
```

```
Data columns (total 17 columns):
```

#	Column	Non-Null Count	Dtype
0	tweet_id	2297 non-null	int64
1	in_reply_to_status_id	2297 non-null	float64
2	in_reply_to_user_id	2297 non-null	float64
3	timestamp	2297 non-null	object
4	source	2297 non-null	object
5	text	2297 non-null	object
6	retweeted_status_id	2297 non-null	float64
7	retweeted_status_user_id	2297 non-null	float64
8	retweeted_status_timestamp	2297 non-null	object
9	expanded_urls	2297 non-null	object

```

10 rating_numerator      2297 non-null    int64
11 rating_denominator    2297 non-null    int64
12 name                  2297 non-null    object
13 doggo                 2297 non-null    object
14 floofer               2297 non-null    object
15 pupper               2297 non-null    object
16 puppo                 2297 non-null    object
dtypes: float64(4), int64(3), object(10)
memory usage: 323.0+ KB

```

1.3.2 Issue #2:

tweeter_archive: Null values replaced by None in doggo, floofer, pupper, puppo columns; name column sometimes has value 'a'

Define In doggo, floofer, pupper, puppo columns, replace None by 0, in name column replace 'a' by None

Code

```

[528]: twitter_archive_clean.loc[twitter_archive_clean['doggo'] == 'None', 'doggo'] = 0
        twitter_archive_clean.loc[twitter_archive_clean['pupper'] == 'None', 'pupper'] = 0
        twitter_archive_clean.loc[twitter_archive_clean['puppo'] == 'None', 'puppo'] = 0
        twitter_archive_clean.loc[twitter_archive_clean['floofer'] == 'None', 'floofer'] = 0
        twitter_archive_clean.loc[twitter_archive_clean['name'] == 'a', 'name'] = None

```

Test

```

[529]: twitter_archive_clean[twitter_archive_clean['doggo'] == 'None']

```

[529]: Empty DataFrame

Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp, source, text, retweeted_status_id, retweeted_status_user_id, retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator, name, doggo, floofer, pupper, puppo]
Index: []

```

[530]: twitter_archive_clean[twitter_archive_clean['pupper'] == 'None']

```

[530]: Empty DataFrame

Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp, source, text, retweeted_status_id, retweeted_status_user_id, retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator, name, doggo, floofer, pupper, puppo]
Index: []

```
[531]: twitter_archive_clean[twitter_archive_clean['puppo'] == 'None']
```

```
[531]: Empty DataFrame
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp,
source, text, retweeted_status_id, retweeted_status_user_id,
retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator,
name, doggo, floofer, pupper, puppo]
Index: []
```

```
[532]: twitter_archive_clean[twitter_archive_clean['floofer'] == 'None']
```

```
[532]: Empty DataFrame
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp,
source, text, retweeted_status_id, retweeted_status_user_id,
retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator,
name, doggo, floofer, pupper, puppo]
Index: []
```

```
[533]: twitter_archive_clean[twitter_archive_clean['name'] == 'a']
```

```
[533]: Empty DataFrame
Columns: [tweet_id, in_reply_to_status_id, in_reply_to_user_id, timestamp,
source, text, retweeted_status_id, retweeted_status_user_id,
retweeted_status_timestamp, expanded_urls, rating_numerator, rating_denominator,
name, doggo, floofer, pupper, puppo]
Index: []
```

1.3.3 Issue #3:

twitter_archive table: timestamp and retweeted_status_timestamp columns are object(string) type not datetime

Define Convert type of timestamp and retweeted_status_timestamp columns into datetime

Code

```
[534]: twitter_archive_clean['timestamp'] = pd.
        ↳to_datetime(twitter_archive_clean['timestamp'])
twitter_archive_clean['retweeted_status_timestamp'] = pd.
        ↳to_datetime(twitter_archive_clean['retweeted_status_timestamp'])
```

Test

```
[535]: twitter_archive_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2297 entries, 0 to 2355
Data columns (total 17 columns):
```

#	Column	Non-Null Count	Dtype
0	tweet_id	2297 non-null	int64
1	in_reply_to_status_id	2297 non-null	float64
2	in_reply_to_user_id	2297 non-null	float64
3	timestamp	2297 non-null	datetime64[ns, UTC]
4	source	2297 non-null	object
5	text	2297 non-null	object
6	retweeted_status_id	2297 non-null	float64
7	retweeted_status_user_id	2297 non-null	float64
8	retweeted_status_timestamp	2297 non-null	datetime64[ns, UTC]
9	expanded_urls	2297 non-null	object
10	rating_numerator	2297 non-null	int64
11	rating_denominator	2297 non-null	int64
12	name	2297 non-null	object
13	doggo	2297 non-null	object
14	floofer	2297 non-null	object
15	pupper	2297 non-null	object
16	puppo	2297 non-null	object

dtypes: datetime64[ns, UTC] (2), float64(4), int64(3), object(8)
memory usage: 323.0+ KB

1.3.4 Issue #4:

tweeter_archive, df_tweet tables: some tweet_id has no image in img_prediction

Define

1. Filter id (in df_tweet table) which exist in img_prediction table
2. Filter tweet_id(in twitter_archive table) which exist in img_prediction table

Code

```
[536]: tweet_id_img = img_prediction_clean['tweet_id'].to_numpy()
twitter_archive_clean = twitter_archive_clean.
↳ loc[twitter_archive_clean['tweet_id'].isin(tweet_id_img)]
df_tweet_clean = df_tweet_clean.loc[df_tweet_clean['id'].isin(tweet_id_img)]
```

```
[537]: tweet_id_RT = df_tweet_clean['id'].to_numpy()
twitter_archive_clean = twitter_archive_clean.
↳ loc[twitter_archive_clean['tweet_id'].isin(tweet_id_RT)]
```

Test

```
[538]: twitter_archive_clean['tweet_id'].count()
```

```
[538]: 2053
```

```
[539]: df_tweet_clean['id'].count()
```

[539]: 2053

```
[540]: img_prediction_clean['tweet_id'].count()
```

[540]: 2075

1.3.5 Issue #5:

twitter_archive table: the dog_stage variable is hidden in column headers: doggo, floofer, pupper, puppo

Define Melt the *doggo*, *floofer*, *pupper*, *puppo* columns to a *dog_stage* column

Code

```
[541]: twitter_archive_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2053 entries, 0 to 2355
Data columns (total 17 columns):
 #   Column                Non-Null Count  Dtype
---  -
 0   tweet_id              2053 non-null   int64
 1   in_reply_to_status_id 2053 non-null   float64
 2   in_reply_to_user_id   2053 non-null   float64
 3   timestamp              2053 non-null   datetime64[ns, UTC]
 4   source                 2053 non-null   object
 5   text                   2053 non-null   object
 6   retweeted_status_id   2053 non-null   float64
 7   retweeted_status_user_id 2053 non-null   float64
 8   retweeted_status_timestamp 2053 non-null   datetime64[ns, UTC]
 9   expanded_urls         2053 non-null   object
10   rating_numerator       2053 non-null   int64
11   rating_denominator     2053 non-null   int64
12   name                   2053 non-null   object
13   doggo                  2053 non-null   object
14   floofer                2053 non-null   object
15   pupper                 2053 non-null   object
16   puppo                  2053 non-null   object
dtypes: datetime64[ns, UTC](2), float64(4), int64(3), object(8)
memory usage: 288.7+ KB
```

```
[542]: twitter_archive_clean = pd.melt(twitter_archive_clean, id_vars=['tweet_id',
    ↳ 'in_reply_to_status_id', 'in_reply_to_user_id', 'timestamp', 'source',
    ↳ 'text',
    ↳ 'retweeted_status_id',
    ↳ 'retweeted_status_user_id', 'retweeted_status_timestamp',
```

```

                                'expanded_urls',
    ↪ 'rating_numerator', 'rating_denominator', 'name'],
                                var_name='dog_stage', value_name='yes_or_no')

```

Test

```
[543]: twitter_archive_clean.sample(5)
```

```

[543]:
      tweet_id  in_reply_to_status_id  in_reply_to_user_id  \
2381  821107785811234820                0.0                0.0
1822  670408998013820928                0.0                0.0
3694  673906403526995968                0.0                0.0
5958  669680153564442624                0.0                0.0
403   810657578271330305                0.0                0.0

      timestamp  \
2381 2017-01-16 21:32:06+00:00
1822 2015-11-28 01:08:55+00:00
3694 2015-12-07 16:46:21+00:00
5958 2015-11-26 00:52:45+00:00
403  2016-12-19 01:26:42+00:00

      source  \
2381 <a href="http://twitter.com/download/iphone" r...
1822 <a href="http://twitter.com/download/iphone" r...
3694 <a href="http://twitter.com/download/iphone" r...
5958 <a href="http://twitter.com/download/iphone" r...
403  <a href="http://twitter.com/download/iphone" r...

      text  retweeted_status_id  \
2381 Here's a doggo who looks like he's about to gi...      0.0
1822 This is Peanut. He was the World Table Tennis ...      0.0
3694 Guys I'm getting real tired of this. We only r...      0.0
5958 This is Shawwn. He's a Turkish Gangrene Robitu...      0.0
403  This is Pavlov. His floatation device has fail...      0.0

      retweeted_status_user_id retweeted_status_timestamp  \
2381                0.0 2099-12-31 00:00:00+00:00
1822                0.0 2099-12-31 00:00:00+00:00
3694                0.0 2099-12-31 00:00:00+00:00
5958                0.0 2099-12-31 00:00:00+00:00
403                 0.0 2099-12-31 00:00:00+00:00

      expanded_urls  rating_numerator  \
2381 https://twitter.com/dog_rates/status/821107785...      11
1822 https://twitter.com/dog_rates/status/670408998...      10
3694 https://twitter.com/dog_rates/status/673906403...       3

```

5958	https://twitter.com/dog_rates/status/669680153...	8
403	https://twitter.com/dog_rates/status/810657578...	11

	rating_denominator	name	dog_stage	yes_Or_no
2381	10	None	floofer	0
1822	10	Peanut	doggo	0
3694	10	None	floofer	0
5958	10	Shawwn	pupper	0
403	10	Pavlov	doggo	0

1.3.6 Issue #6:

tweeter_archive table: doggo, floofer, pupper, puppo have not None values equal to name of their corresponding column; So normally, these columns are booleans

Define In *Yes_Or_no* columns, replace all values different from '0', by '1'; Change type of this column to category and delete rows where name is different from None and yes_Or_no equals to 0

Code

```
[544]: twitter_archive_clean.loc[twitter_archive_clean['yes_Or_no'] != '0',
    ↪ 'yes_Or_no'] = '1'
```

```
[545]: from pandas.api.types import CategoricalDtype
cat_dtype = CategoricalDtype(
    categories=['0', '1'], ordered=True)
```

```
[546]: twitter_archive_clean['yes_Or_no'] = twitter_archive_clean['yes_Or_no'].
    ↪ astype(cat_dtype)
```

```
[547]: indexAge = twitter_archive_clean[ (twitter_archive_clean['name'] != 'None') &
    ↪ (twitter_archive_clean['yes_Or_no'] == '0') ].index
twitter_archive_clean.drop(indexAge , inplace=True)
```

Test

```
[548]: twitter_archive_clean['yes_Or_no'].value_counts()
```

```
[548]: 0    2364
      1     329
      Name: yes_Or_no, dtype: int64
```

```
[549]: twitter_archive_clean['yes_Or_no'].dtype
```

```
[549]: CategoricalDtype(categories=['0', '1'], ordered=True)
```

1.3.7 Issue #7:

tweeter_archive table: in_reply_to_status_id, in_reply_to_user_id, retweeted_status_user_id, retweeted_status_id columns have float type instead of int(tweet_id column has int type)

Define Change type of all *id columns except tweet_id to int

Code

```
[550]: convert_dict = {'in_reply_to_status_id': int,
                      'in_reply_to_user_id': int,
                      'retweeted_status_user_id': int,
                      'retweeted_status_id': int,
                      }
twitter_archive_clean = twitter_archive_clean.astype(convert_dict)
```

Test

```
[551]: twitter_archive_clean.dtypes
```

```
[551]: tweet_id                int64
in_reply_to_status_id        int64
in_reply_to_user_id          int64
timestamp                    datetime64[ns, UTC]
source                       object
text                         object
retweeted_status_id          int64
retweeted_status_user_id     int64
retweeted_status_timestamp    datetime64[ns, UTC]
expanded_urls                object
rating_numerator              int64
rating_denominator            int64
name                         object
dog_stage                    object
yes_or_no                    category
dtype: object
```

```
[552]: twitter_archive_clean.sample(5)
```

```
[552]:
```

	tweet_id	in_reply_to_status_id	in_reply_to_user_id	\
1947	667861340749471744	0	0	
7344	697596423848730625	0	0	
8072	668542336805281792	0	0	
1256	691090071332753408	0	0	
5210	704847917308362754	0	0	

	timestamp	\
1947	2015-11-21 00:25:26+00:00	


```

7344 2016-02-11 01:42:02+00:00
8072 2015-11-22 21:31:28+00:00
1256 2016-01-24 02:48:07+00:00
5210 2016-03-02 01:56:53+00:00

```

```

                                source \
1947 <a href="http://twitter.com/download/iphone" r...
7344 <a href="http://twitter.com/download/iphone" r...
8072 <a href="http://twitter.com/download/iphone" r...
1256 <a href="http://twitter.com/download/iphone" r...
5210 <a href="http://twitter.com/download/iphone" r...

```

```

                                text  retweeted_status_id \
1947 This is a Shotokon Macadamia mix named Cheryl...      0
7344 Here's a pupper with a piece of pizza. Two of ...      0
8072 There's a lot going on here but in my honest o...      0
1256 Happy Saturday here's a dog in a mailbox. 12/1...      0
5210 "Yes hi could I get a number 4 with no pickles...      0

```

```

retweeted_status_user_id retweeted_status_timestamp \
1947                      0 2099-12-31 00:00:00+00:00
7344                      0 2099-12-31 00:00:00+00:00
8072                      0 2099-12-31 00:00:00+00:00
1256                      0 2099-12-31 00:00:00+00:00
5210                      0 2099-12-31 00:00:00+00:00

```

```

                                expanded_urls  rating_numerator \
1947 https://twitter.com/dog_rates/status/667861340...      9
7344 https://twitter.com/dog_rates/status/697596423...     11
8072 https://twitter.com/dog_rates/status/668542336...     10
1256 https://twitter.com/dog_rates/status/691090071...     12
5210 https://twitter.com/dog_rates/status/704847917...     12

```

```

rating_denominator  name  dog_stage  yes_or_no
1947                10  None      doggo      0
7344                10  None     puppo      0
8072                10  None     puppo      0
1256                10  None     doggo      0
5210                10  None     pupper     0

```

1.3.8 Issue #8:

img_prediction table : for image number 4, there is no properties(p4, p4_conf, p4_dog)

Define Filter rows with img_num different from 4

Code

```
[553]: img_prediction_clean = img_prediction_clean[img_prediction_clean['img_num'] != 4]
```

Test

```
[554]: img_prediction_clean[img_prediction_clean['img_num'] == 4]
```

```
[554]: Empty DataFrame
Columns: [tweet_id, jpg_url, img_num, p1, p1_conf, p1_dog, p2, p2_conf, p2_dog, p3, p3_conf, p3_dog]
Index: []
```

1.3.9 Issue #9:

img_prediction table: some tweet_id have not a dog img (p1_dog, p2_dog, p3_dog are False)

Define Filter rows with p1_dog, p2_dog and p3_dog are not False in same row; And update twitter_archive and df_tweet tables(by filtering rows where tweet_id or id has image file)

Code

```
[555]: img_prediction_clean.dtypes
```

```
[555]: tweet_id      int64
jpg_url      object
img_num      int64
p1           object
p1_conf      float64
p1_dog       bool
p2           object
p2_conf      float64
p2_dog       bool
p3           object
p3_conf      float64
p3_dog       bool
dtype: object
```

```
[556]: img_prediction_clean=img_prediction_clean.loc[~((img_prediction_clean['p3_dog'] == False)&(img_prediction_clean['p2_dog'] == False)&(img_prediction_clean['p1_dog'] == False))]
```

```
[557]: tweet_id_img = img_prediction_clean['tweet_id'].to_numpy()
twitter_archive_clean = twitter_archive_clean.loc[twitter_archive_clean['tweet_id'].isin(tweet_id_img)]
df_tweet_clean = df_tweet_clean.loc[df_tweet_clean['id'].isin(tweet_id_img)]
```

Test

```
[558]: img_prediction_clean.loc[((img_prediction_clean['p3_dog'] ==_
↳False)&(img_prediction_clean['p2_dog'] ==_
↳False)&(img_prediction_clean['p1_dog'] == False))]
```

```
[558]: Empty DataFrame
Columns: [tweet_id, jpg_url, img_num, p1, p1_conf, p1_dog, p2, p2_conf, p2_dog,
p3, p3_conf, p3_dog]
Index: []
```

```
[559]: twitter_archive_clean['tweet_id'].count()
```

```
[559]: 2061
```

```
[560]: img_prediction_clean['tweet_id'].count()
```

```
[560]: 1724
```

```
[561]: df_tweet_clean['id'].count()
```

```
[561]: 1706
```

```
[562]: img_prediction_clean.sample(5)
```

```
[562]:
```

	tweet_id	jpg_url	\
1241	747103485104099331	https://pbs.twimg.com/media/C14-pevXEAAb8VW.jpg	
777	689835978131935233	https://pbs.twimg.com/media/CZLKJpDWQAA-5u4.jpg	
983	707411934438625280	https://pbs.twimg.com/media/CdE7ZktXIAEiWLj.jpg	
1259	748699167502000129	https://pbs.twimg.com/media/CmPp5pOXgAAD_SG.jpg	
1706	817536400337801217	https://pbs.twimg.com/media/C1h4_MEXUAAARxQF.jpg	

	img_num	p1	p1_conf	p1_dog	p2	\
1241	1	Labrador_retriever	0.991954	True	golden_retriever	
777	1	collie	0.600186	True	Shetland_sheepdog	
983	1	Lakeland_terrier	0.738277	True	Airedale	
1259	1	Pembroke	0.849029	True	Cardigan	
1706	2	pug	0.971358	True	French_bulldog	

	p2_conf	p2_dog	p3	p3_conf	p3_dog
1241	0.002228	True	doormat	0.001404	False
777	0.298939	True	borzoi	0.022616	True
983	0.028515	True	giant_schnauzer	0.024876	True
1259	0.083629	True	kelpie	0.024394	True
1706	0.028518	True	Boston_bull	0.000086	True

1.3.10 Issue #10:

tweet_id column(which is in img_prediction table) is duplicated in df_tweet

Define

1. Rename id column to tweet_id in df_tweet table, merge all columns(except tweet_id) of img_prediction table to df_tweet table, joining on tweet_id
2. For tweet_id in img_prediction table which are not in df_tweet table, set retweet_count and favourite_count to 0

Code

```
[563]: df_tweet_clean.rename(columns={"id": "tweet_id"}, inplace=True)
df_tweet_clean = pd.merge(df_tweet_clean, img_prediction_clean,
                          on=['tweet_id'], how='left')

[564]: %%capture --no-display
import numpy as np
extra_tweet = img_prediction_clean[~(img_prediction_clean['tweet_id'].
    ↳isin(df_tweet_clean['tweet_id'].to_numpy()))]
delta_size = (df_tweet_clean['tweet_id'].count() - img_prediction['tweet_id'].
    ↳count()) * -1
extra_tweet['retweet_count'] = pd.Series(np.zeros(delta_size))
extra_tweet['favourite_count'] = pd.Series(np.zeros(delta_size))
extra_tweet['retweet_count'].fillna(0, inplace=True)
extra_tweet['favourite_count'].fillna(0, inplace=True)
extra_tweet['retweet_count']=extra_tweet['retweet_count'].astype(int)
extra_tweet['favourite_count']=extra_tweet['favourite_count'].astype(int)

[565]: extra_tweet = extra_tweet[['tweet_id', 'retweet_count', 'favourite_count',
    ↳'jpg_url', 'p1', 'p1_conf', 'p1_dog', 'p2',
    ↳'p2_conf', 'p2_dog', 'p3', 'p3_conf', 'p3_dog']]
df_tweet = pd.concat([df_tweet_clean, extra_tweet2], ignore_index=True)
```

Test

```
[566]: df_tweet_clean.sample(5)
```

```
[566]:
```

	tweet_id	retweet_count	favorite_count	\
1357	674999807681908736	936	1939	
1497	670832455012716544	181	628	
943	705475953783398401	807	2668	
695	747219827526344708	1414	4772	
1531	670374371102445568	230	656	

	jpg_url	img_num	\
1357	https://pbs.twimg.com/media/CV4UvgNUkAEEnZd.jpg	1	
1497	https://pbs.twimg.com/media/CU9GjzrUkAAWPh4.jpg	1	
943	https://pbs.twimg.com/media/CcpaoR9WAAAK1JJ.jpg	1	
695	https://pbs.twimg.com/media/C16odlVWQA1y5uk.jpg	2	
1531	https://pbs.twimg.com/media/CU217yvXAAUyYIJ.jpg	1	

	p1	p1_conf	p1_dog		p2	p2_conf	\
1357	Rottweiler	0.591829	True		Doberman	0.204544	
1497	malinois	0.317607	True	Norwegian_elkhound		0.274901	
943	golden_retriever	0.908784	True	Labrador_retriever		0.030361	
695	Shetland_sheepdog	0.548018	True	marmot		0.165503	
1531	English_springer	0.974936	True	English_setter		0.011661	

	p2_dog		p3	p3_conf	p3_dog
1357	True	black-and-tan_coonhound		0.078602	True
1497	True		bathing_cap	0.114643	False
943	True		tennis_ball	0.004996	False
695	False		collie	0.043003	True
1531	True		cocker_spaniel	0.002689	True

1.4 Storing Data

Save gathered, assessed, and cleaned master dataset to a CSV file named “twitter_archive_master.csv”.

```
[568]: twitter_archive_clean.to_csv('twitter_master_archive.csv')
df_tweet_clean.to_csv('tweet_master_properties.csv')
```