The WeRateDogs Project

An analysis of data wrangled from Twitter

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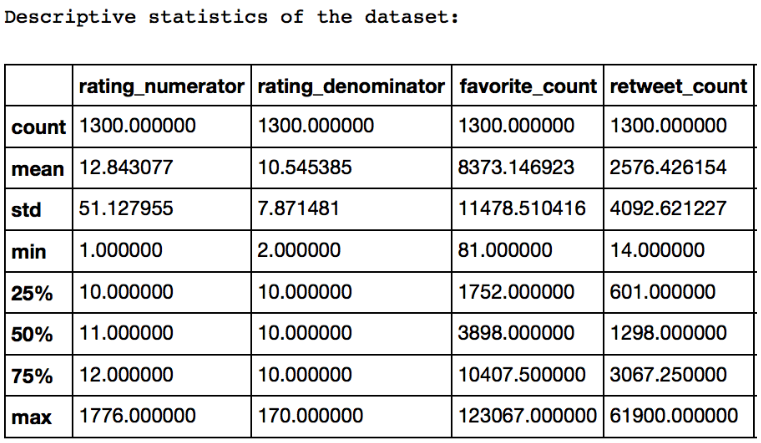
According to an article by The Globe and Mail, Twitter today has almost 200 million users worldwide. Approximately 460,000 new Twitter accounts are opened daily. More than 140 million tweets are sent daily. That's one billion weekly tweets! For this project, the goal was to capitalize on Twitter's vast amounts of tweet data, utilizing the Twitter API to exploit the Twitter data of the user @dog_rates, aka WeRateDogs. WeRateDogs is a very popular Twitter account with over 4 million followers and has received international media coverage. WeRateDogs gained its popularity by rating people's dogs with a good-natured comment about the dog. The rating system is based on a fraction, with the denominator fixed at 10 and the numerator is almost always a number greater than 10 ($\frac{13}{10}$,$\frac{14}{10}$, etc.) Why, you ask? Because "they're good dogs Brent."

For this analysis I gathered data from three different sources. WeRateDogs gave Udacity exclusive access to their Twitter archive for this project in the form of a csv file. This archive contains basic tweet data (tweet ID, timestamp, text, etc.) for all 5000+ of their tweets as they stood on August 1, 2017. Each tweet image was run through a convolutional neural network with the purpose of analyzing the images to correctly identify the dog breeds. The convolutional neural network predictions were programmatically downloaded using the Requests Python library as a tsv file. And finally, using the tweet IDs from the WeRateDogs archive I queried the Twitter API for each tweet's JSON data using the Python's Tweepy library I stored each tweet's entire set of JSON data, which I would later use to analyze the tweet's retweet and favorite (i.e. "like") counts.

Before diving into the statistical analysis, I began by answering some basic questions. What are the most common dog names in the dataset? What does the tweet say about the dog with the lowest rating (i.e. 0/10)? Using the Dog Breed Classifier, what do the dogs with the lowest rating look like and was the classifier able to accurately predict the dog's breed?



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Descriptive statistics of the dataset:
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	rating_numerator	rating_denominator	favorite_count	retweet_count
count	1300.000000	1300.000000	1300.000000	1300.000000
mean	12.843077	10.545385	8373.146923	2576.426154
std	51.127955	7.871481	11478.510416	4092.621227
min	1.000000	2.000000	81.000000	14.000000
25%	10.000000	10.000000	1752.000000	601.000000
50%	11.000000	10.000000	3898.000000	1298.000000
75%	12.000000	10.000000	10407.500000	3067.250000
max	1776.000000	170.000000	123067.000000	61900.000000

I discovered the most common dog names within the WeRateDogs dataset, excluding the NaN values, are Oliver, Winston, Tucker and Penny.

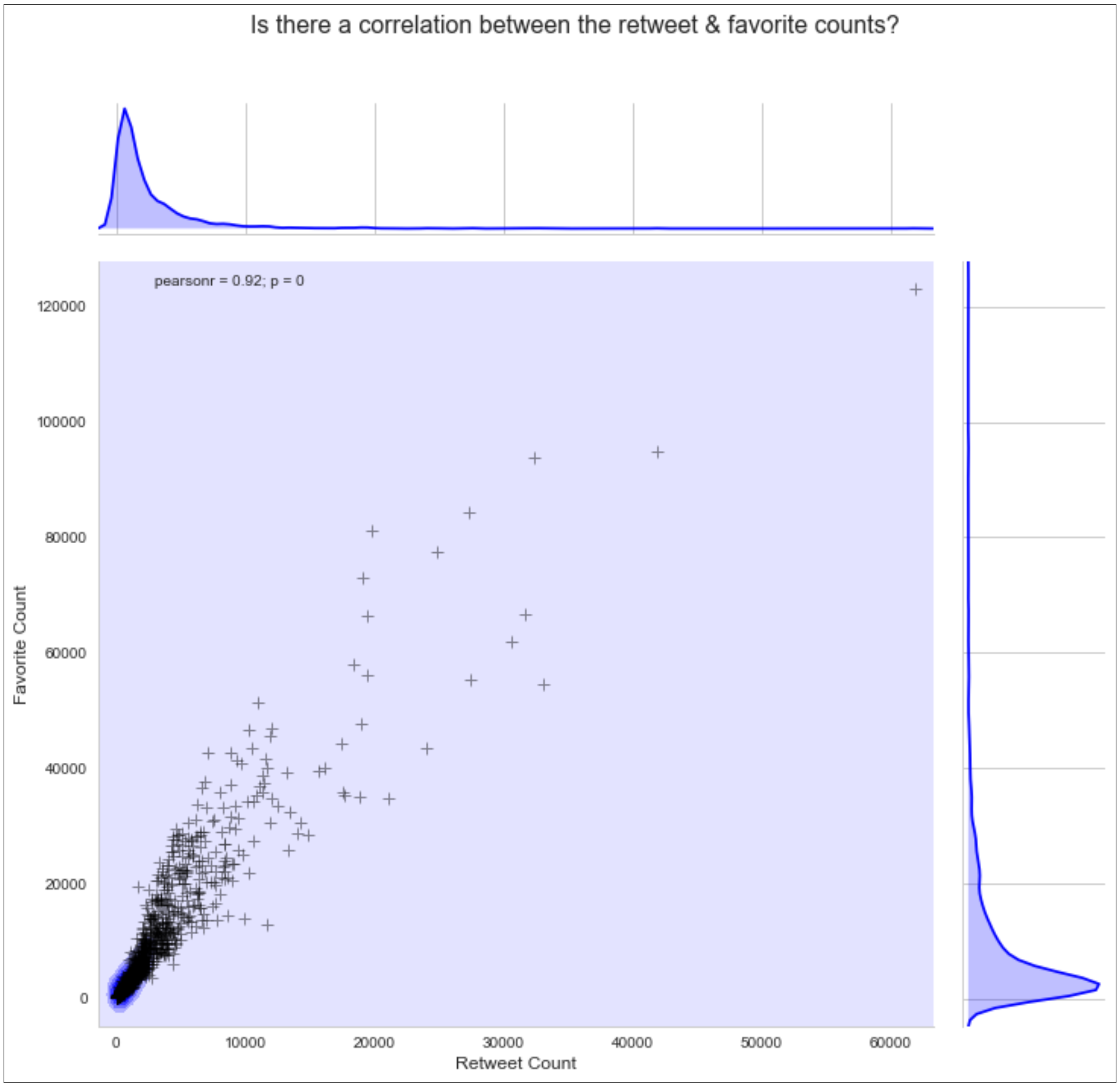
Now let's dive into a statistical analysis of the Dog Ratings!

The mean numerator value is 12.84. The most interesting result is the rating_numerator maximum value of 1776. Recall, July 4, 1776 is the date the United States of America declared its independence from Britain, so let's explore this outlier further.

The rating_ numerator outlier is a dog named Atticus. The tweet was sent on July 4, 2016, stating, "This is Atticus. He's quite simply America af…" Atticus's picture is on the right. Not surprising, the dog breed classifier wasn't able to predict Atticus's breed due to the bowtie and sunglasses.

The doggo with the highest favorite count also has the maximum retweet count. On further investigation I found out that his name is Stephan; he had a rating of 13/10. The tweet said, "This is Stephan. He just wants to help". The Dog Classifier did really well in predicting Stephan's breed. Stephan appears to be a Chihuahua/Corgi mix and the classifier pegged Stephan as a Chihuahua with a predication confidence equal to 0.51. Below is a picture of Stephan; the most popular do in the dataset.

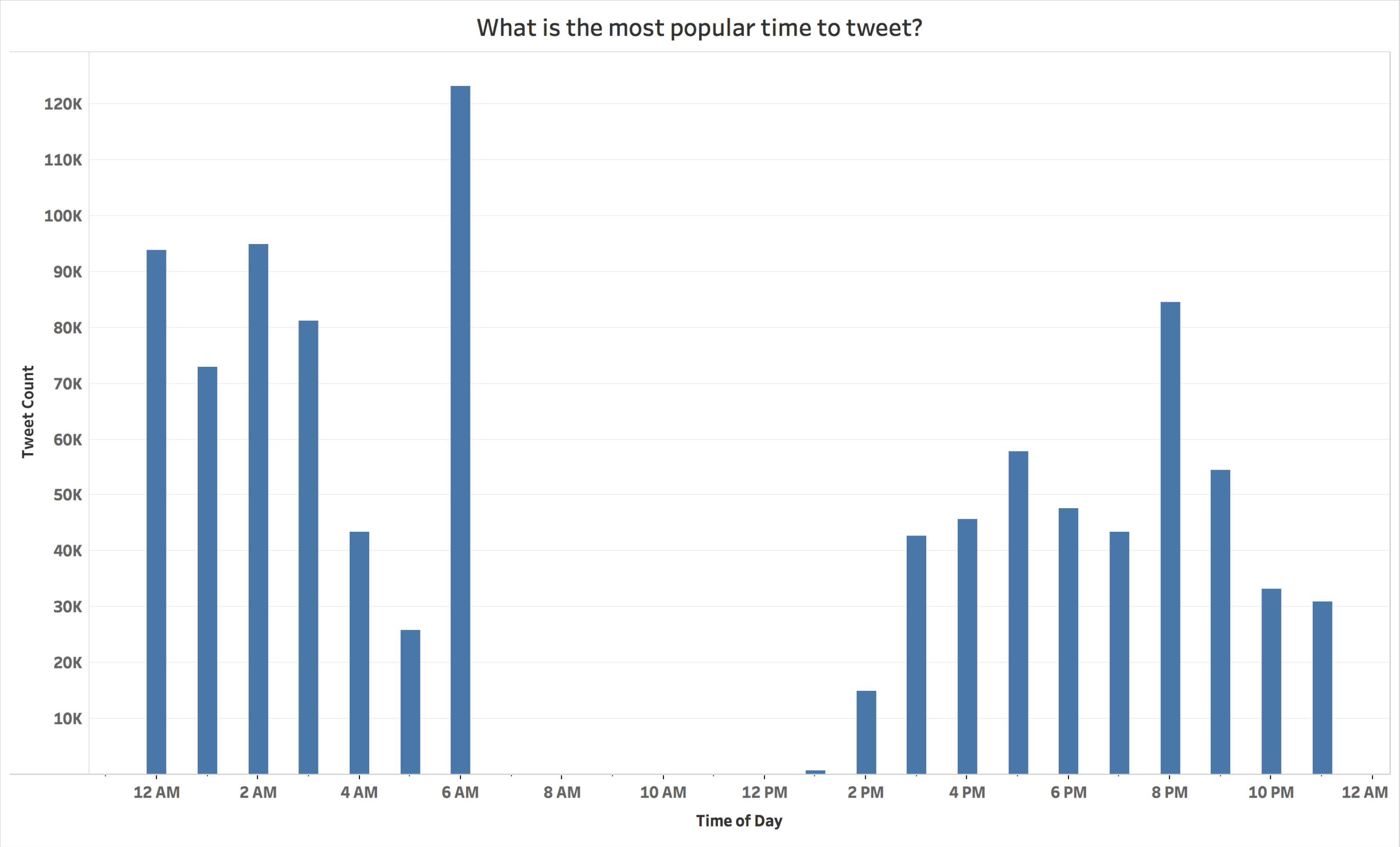
Now it's time to dive into the favorite and retweet count data. The statistical analysis denotes a large positive (right) skewed distribution in both categories indicated by the large standard deviations. The results also indicate people will favorite a tweet more often then they will retweet the original tweet as shown by the larger favorite count.

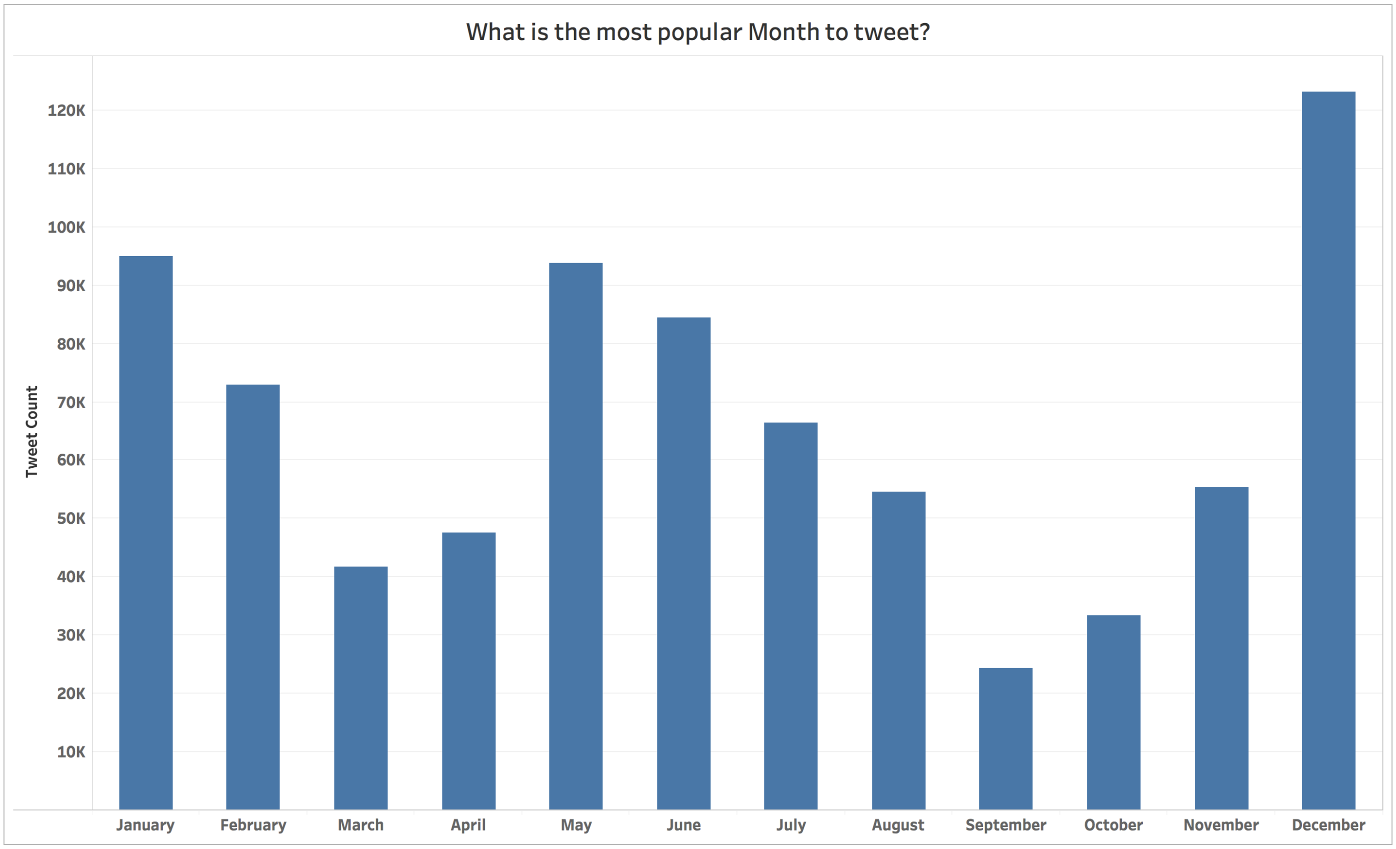


From the visualization above, you will see a strong correlation between the favorite and retweet data with a Pearson correlation coefficient, r, equal to 0.92. The strong correlation makes logical sense because the popular a tweet the higher the favorite and retweet count should be.

With this new insight into the tweet data I was curious, what time of day do people tweet about dogs? Also, what time of year is the most active time for people to tweet about their beloved companion?

As you can see from the visualizations below the 3 most popular times to tweet about dogs are 6am, 12am and 8pm, respectively. Notice that from the statistics report there are a greater number of people “liking” a tweet as compared to the number of retweets. Interestingly, tweet activity is cyclical in nature with relative maximums in January and May with an absolute maximum in December.





In summary, the data analysis of the Twitter user WeRateDogs, showed the most common dog is Oliver. The favorite and retweet data is strongly correlated and the most active time of year for people to tweet about dogs is in December. An adorable Chihuahua mix named Stephan has the highest favorite and retweet count and a doggo named Attitus fooled the neural network dog classier by having the best dressed doggo outfit at the 4th of July BBQ!