Dog Rates Data Wrangling

Introduction

The dataset that is chosen for wrangling (and analysing and visualizing) is the tweet archive of Twitter user @dog_rates, also known as WeRateDogs. WeRateDogs is a Twitter account that rates people's dogs with a humorous comment about the dog.

The goal is to wrangle WeRateDogs Twitter data to create interesting and trustworthy analyses and visualizations.

Data Wrangling

The data wrangling process consists of 3 main steps. They are:

1. **Gathering data** - The data can be gathered in many ways including web scraping, using APIs etc. The data can be gathered from a single source or from many different sources.
2. **Assessing data** - The data needs to assessed for quality and tidiness issues. This can be done visually and/or programmatically.
3. **Cleaning data** - Based on the assessment, the data is cleaned and tested to make sure all the issues identified are resolved.

Gathering Data

The data required for further analysis is collected in this step. The data may be collected from a single source or from multiple sources and combined later. The data could be provided or readily available, scraped from the web or collected using an API.

For this analysis, the required data is gathered from multiple sources. They are:

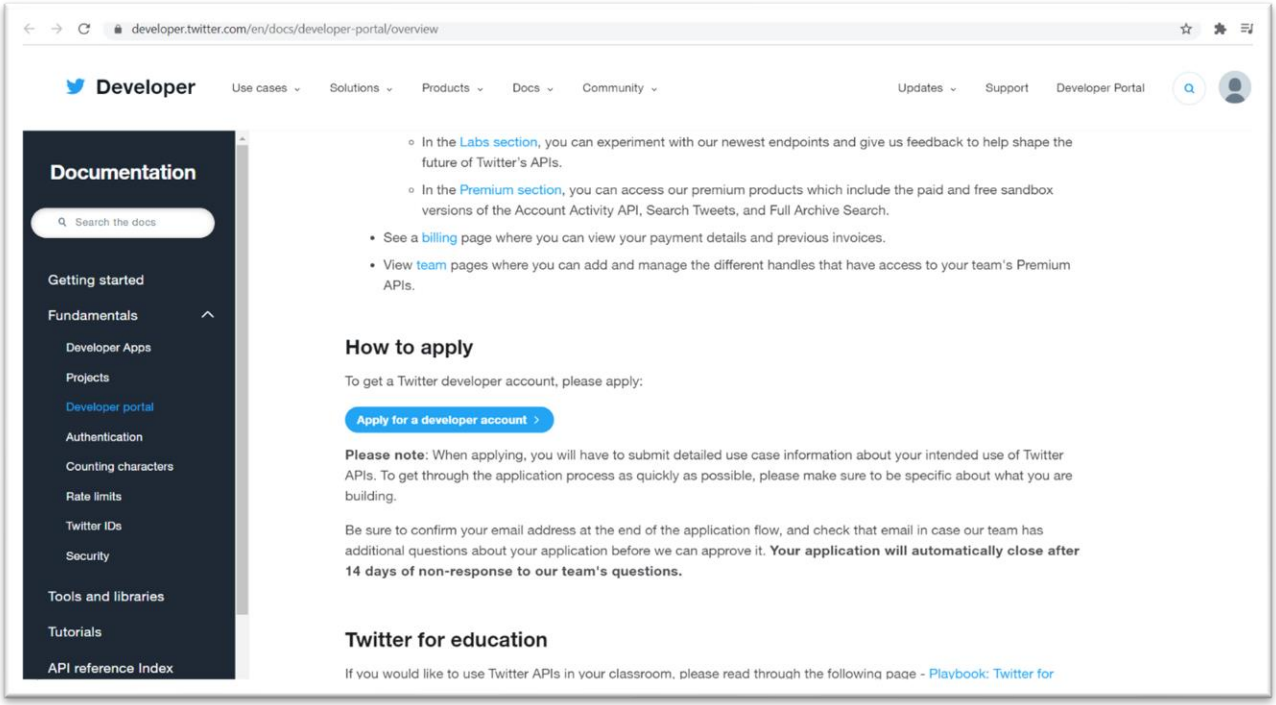
1. The WeRateDogs Twitter archive is enhanced and provided. This file (**twitter_archive_enhanced.csv**) is just downloaded.
2. The tweet image predictions, i.e., what breed of dog (or another object, animal, etc.) is present in each tweet according to a neural network. This file (**image_predictions.tsv**) is hosted on Udacity's servers and is downloaded programmatically (using requests).
3. Additional required and interesting data is obtained by querying the Twitter API (using tweepy) for each tweet's JSON data and store each tweet's entire set of JSON data in a file (**tweet_json.txt**).

Creating the Twitter Developer Account

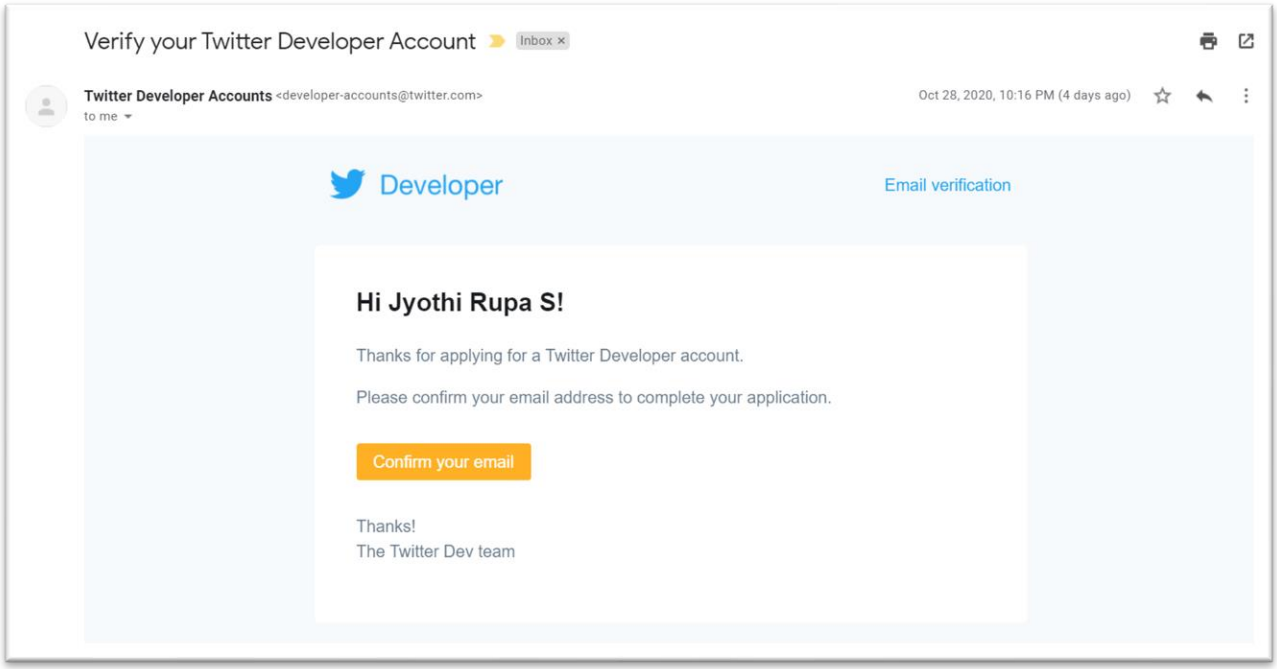
The following are the steps to create a Twitter Developer account in order to query the Twitter API for additional information:

1. Create an account/Log in to Twitter

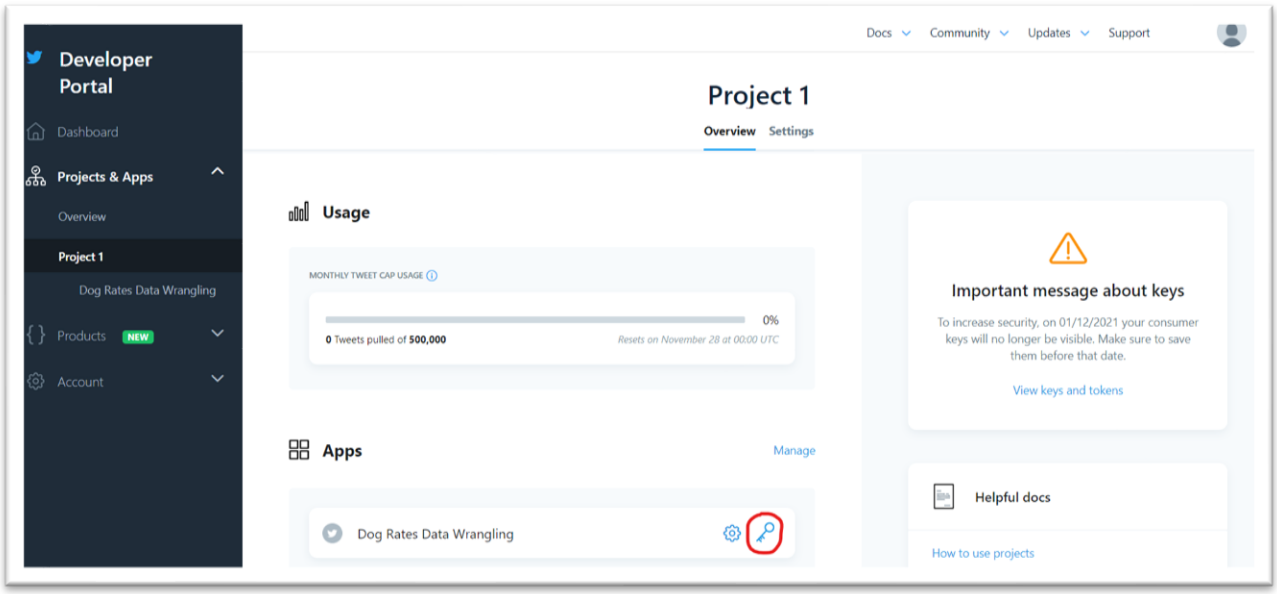
2. Navigate to the “How To Apply” section in this page with link - https://developer.twitter.com/en/docs/developer-portal/overview and click on the “Apply for a developer account” button



3. Provide the details required for the developer account creation
4. Once the details are submitted, you will receive a mail from Twitter confirming that the account has been activated



5. Go to the Keys and Tokens tab on the page you are redirected to from the mail to find or generate the Consumer API keys, and the Access Token and Access Token Secret that you will need



Assessing Data

There are 2 types of issues that need to be assessed. They are:

1. **Quality issues** - Issues with content. Low quality data is also known as dirty data.
2. **Tidiness issues** - Issues with structure that prevent easy analysis. Untidy data is also known as messy data. The requirements of tidy data are:
    - Each variable forms a column
    - Each observation forms a row
    - Each type of observational unit forms a table

These issues can be assessed in 2 ways. They are:

1. **Visual assessment** - Scrolling through the data in your preferred software application
2. **Programmatic assessment** - Using code to view specific portions and summaries of the data

In this analysis, the issues identified during analysis fall under one or more of the following categories:

- Missing data
- Incorrect data types for fields
- Data does not follow the guidelines for tidy data
- Fields have few or many incorrect values

- The values of a field are inconsistent in representation (formatting required)
- Removing unwanted records/fields

Cleaning Data

There are 2 types of cleaning. They are:

1. Manual (not recommended unless the issues are one-off occurrences)
2. Programmatic

The programmatic data cleaning process includes 3 steps. They are:

1. **Define**: Our assessments are converted into defined cleaning tasks. These definitions also serve as an instruction list so others (or we ourself in the future) can look at your work and reproduce it.
2. **Code**: Converting those definitions to code and run that code.
3. **Test**: Testing the dataset, visually or with code, to make sure your cleaning operations worked.

The data cleaning is performed on copies of the original data.

The order in which the various issues are resolved depends on the impact it has on the other issues. For example, if the resolution to a missing data issue is to remove the fields with high number of missing values, and another issue is the data type of the values in of this field, it is logical to consider the missing data issue first.

Generally, first the missing data issues are resolved followed by the tidiness issues and finally the quality issues. The quality issues could be resolved first in case data is to be combined in order to bring about tidiness and there is a large amount of data making the analysis process tedious after combined.

The cleaning is performed programmatically only. Popular python data analysis libraries such as pandas and numpy are used for cleaning the data.

The final cleaned data is saved into a file called **twitter_archive_master.csv**.