Chocolate Bar Ratings Predictor

Team Candy
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Topic Selection

Predicting chocolate bar ratings from variable such as:

- Chocolateur
- Bean type
- Bean Source
- Cocoa Percent

Reason for Topic Selection

- Examined several food and beverage topics
- Chocolate was universally loved by the team
- Dataset was expansive enough to cover final project requirement
- Team became genuinely interested in if cocoa bean types and their source drive chocolate quality.

Team Roles

- Square -(Bruce) Set up Repository and Branch structure
- Triangle - (Tahereh) Build additional ML models to see initial accuracy
- Circle - (Yan) Constructed EDR for PostGres SQL and begin building framework
- X- (Travis) Presentation and technology

Data sources

- Kaggle- Chocolate Bar ratings
  - https://www.kaggle.com/rtatman/chocolate-bar-ratings
- Kaggle - Countries and States Lat Long
  - https://www.kaggle.com/paultimothymooney/latitude-and-longitude-for-every-country-and-state
- Flavors of Cacao website
  - http://flavorsofcacao.com/chocolate_database.html

Four questions to answer

- Where are the best cocoa beans grown?

- Which countries produce the highest-rated bars?

- What’s the relationship between cocoa solids percentage and rating?

- Can we predict if a bar will be 4 stars?

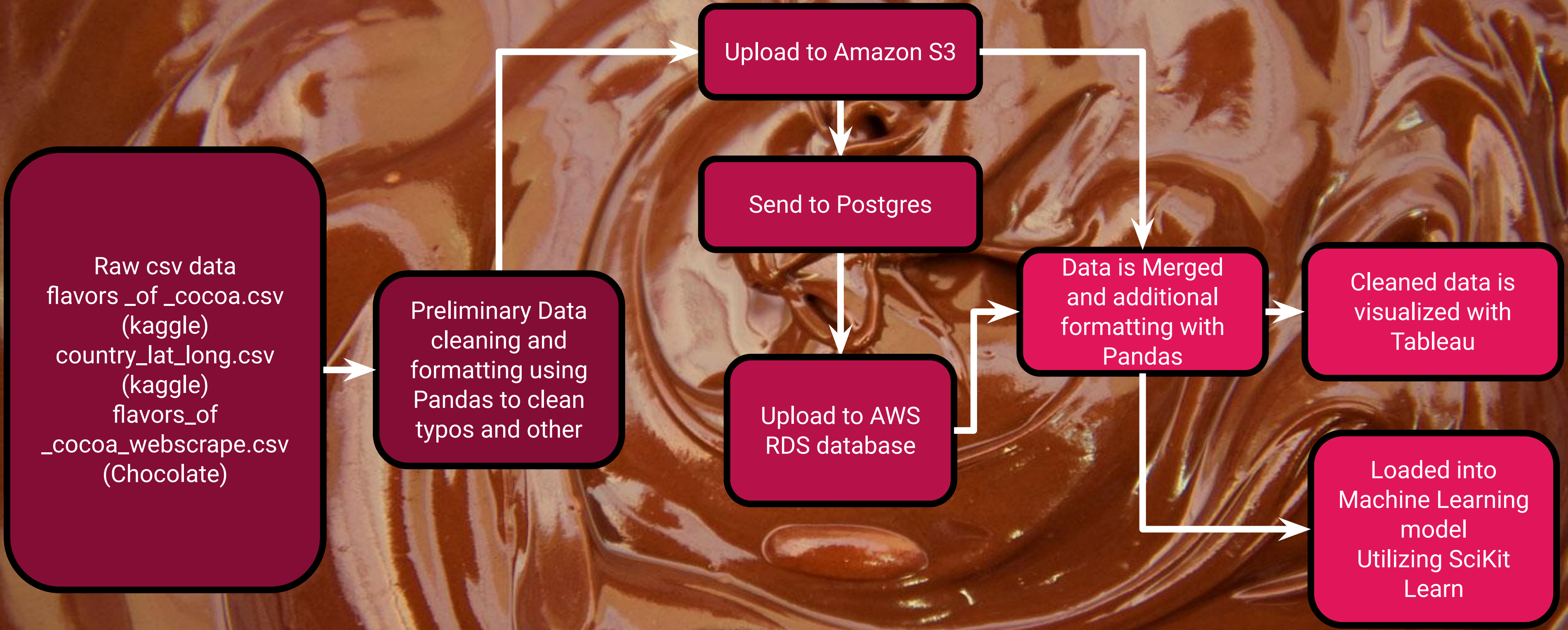
Data exploration phase

- Pandas and Matplot lib were used to review, evaluate and clean datasets
    - Examine null counts
    - Data continuity
    - Data types
- Tableau was used to make initial map plots to look at geographic distribution issues related to typographical errors and level of detail

Data Analysis phase

- Pandas and Matplot lib were used to review, evaluate and clean datasets
  - Initial plots of rating trends vs other features
  - Examine plots to look for skewness in the features and dataset
  - Quicklook plots for any trends or significant outlier anomalies
- Tableau was used to make initial map plots to look at geographic distribution of cocoa bean sources and data bias in geographic space

Data processing and Evaluation Workflow



Raw csv data
flavors _of _cocoa.csv
(kaggle)
country_lat_long.csv
(kaggle)
flavors_of
_cocoa_webscrape.csv
(Chocolate)

Preliminary Data cleaning and formatting using Pandas to clean typos and other

Upload to Amazon S3

Send to Postgres

Upload to AWS RDS database

Data is Merged and additional formatting with Pandas

Cleaned data is visualized with Tableau

Loaded into Machine Learning model
Utilizing SciKit Learn

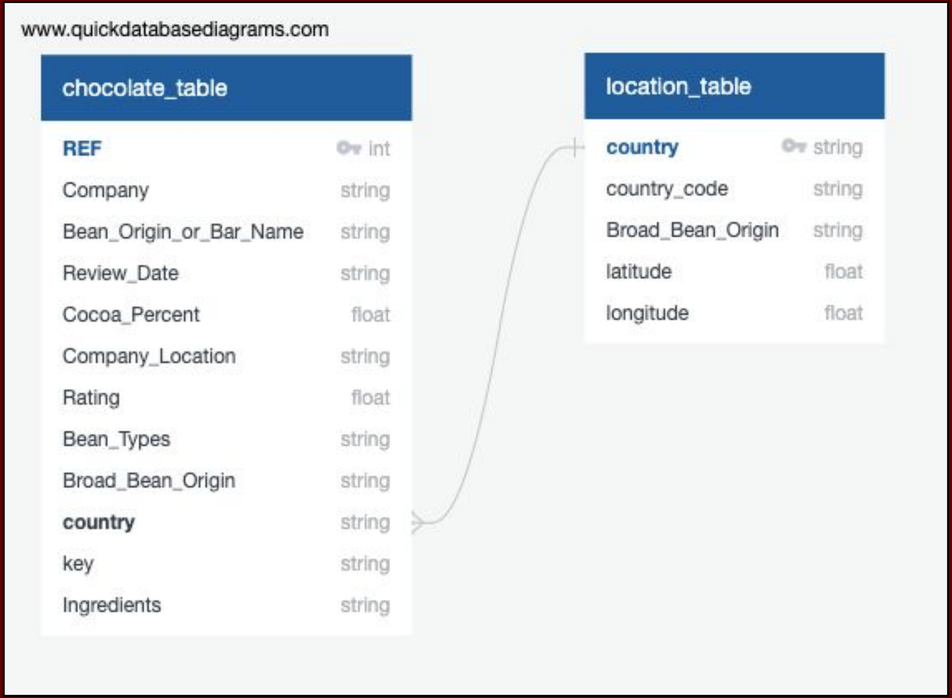
Data Preprocessing and Cleaning

- Pandas will be the primary avenue for cleaning and preparing the data
- Basic data editing of the csv will initially be performed
- Data will be uploaded to Amazon S3
- PostGres SQL with intake data and push to AWS RDS
- Python will merge data and format for use in Machine Learning and export out data to S3 for use in Tableau

Database Structure

AWS Database- Postgres SQL Database

Initial ERD:



www.quickdatabasediagrams.com

chocolate_table	
REF	int
Company	string
Bean_Origin_or_Bar_Name	string
Review_Date	string
Cocoa_Percent	float
Company_Location	string
Rating	float
Bean_Types	string
Broad_Bean_Origin	string
country	string
key	string
Ingredients	string

location_table	
country	string
country_code	string
Broad_Bean_Origin	string
latitude	float
longitude	float

Machine Learning Model

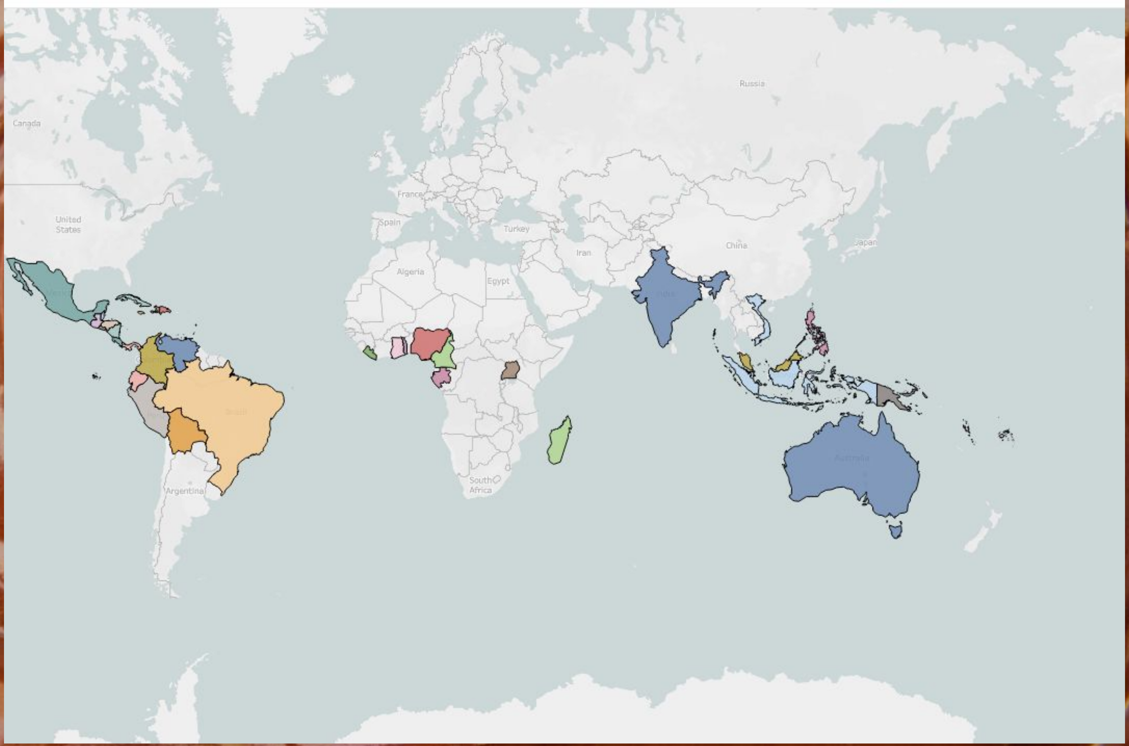
- **Kera Neural Network**

- **Investigating others- Random Forest and SVM**

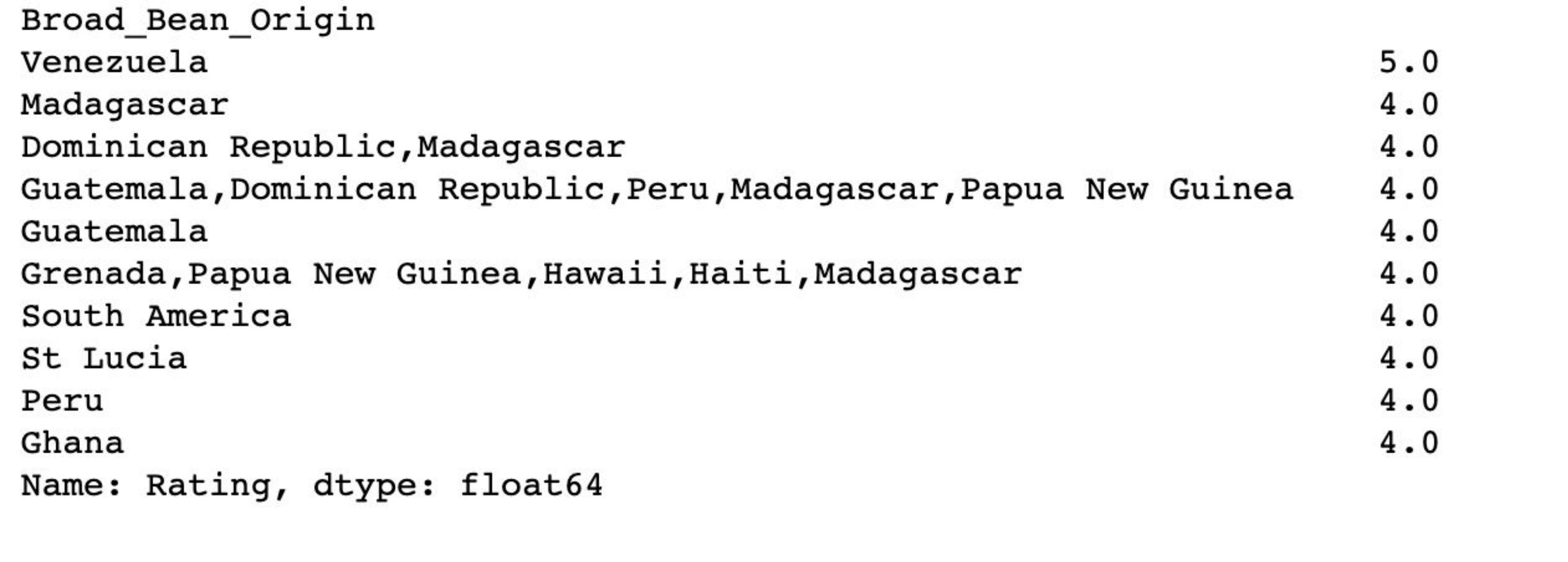
Dashboard

Tableau-

Global Chocolate production

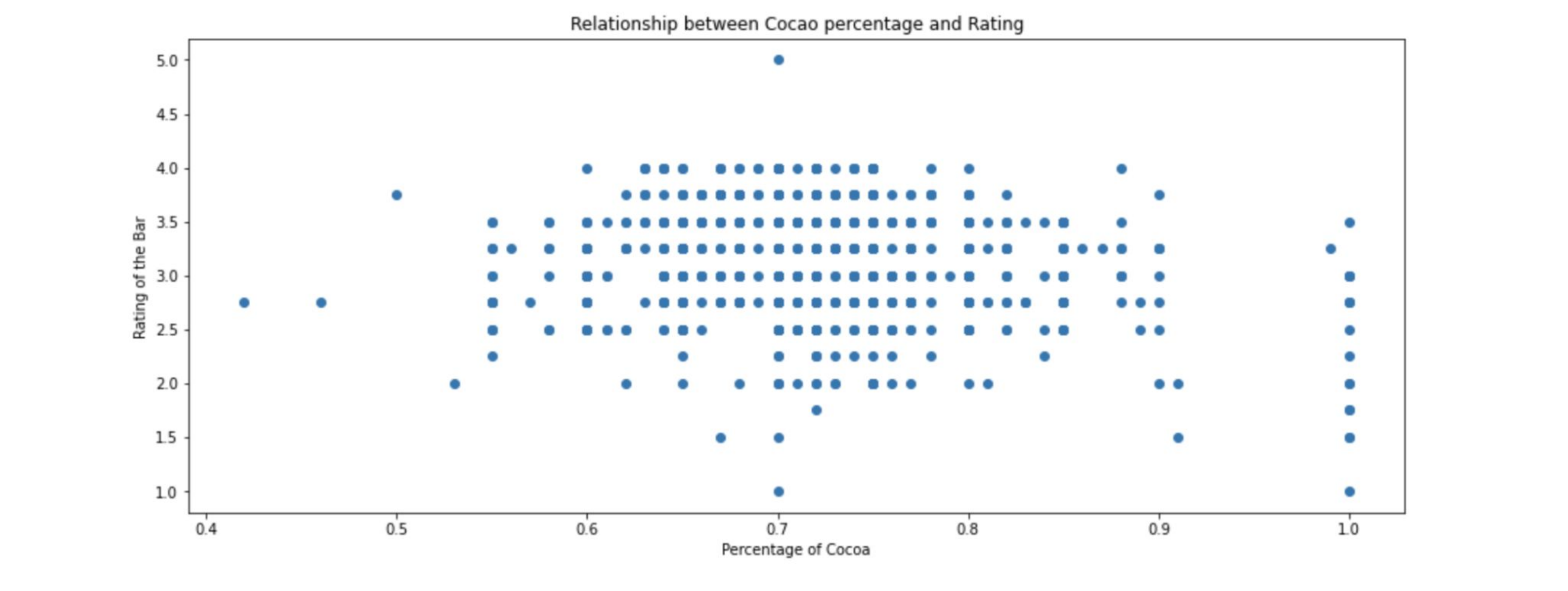


Where are the best beans grown?

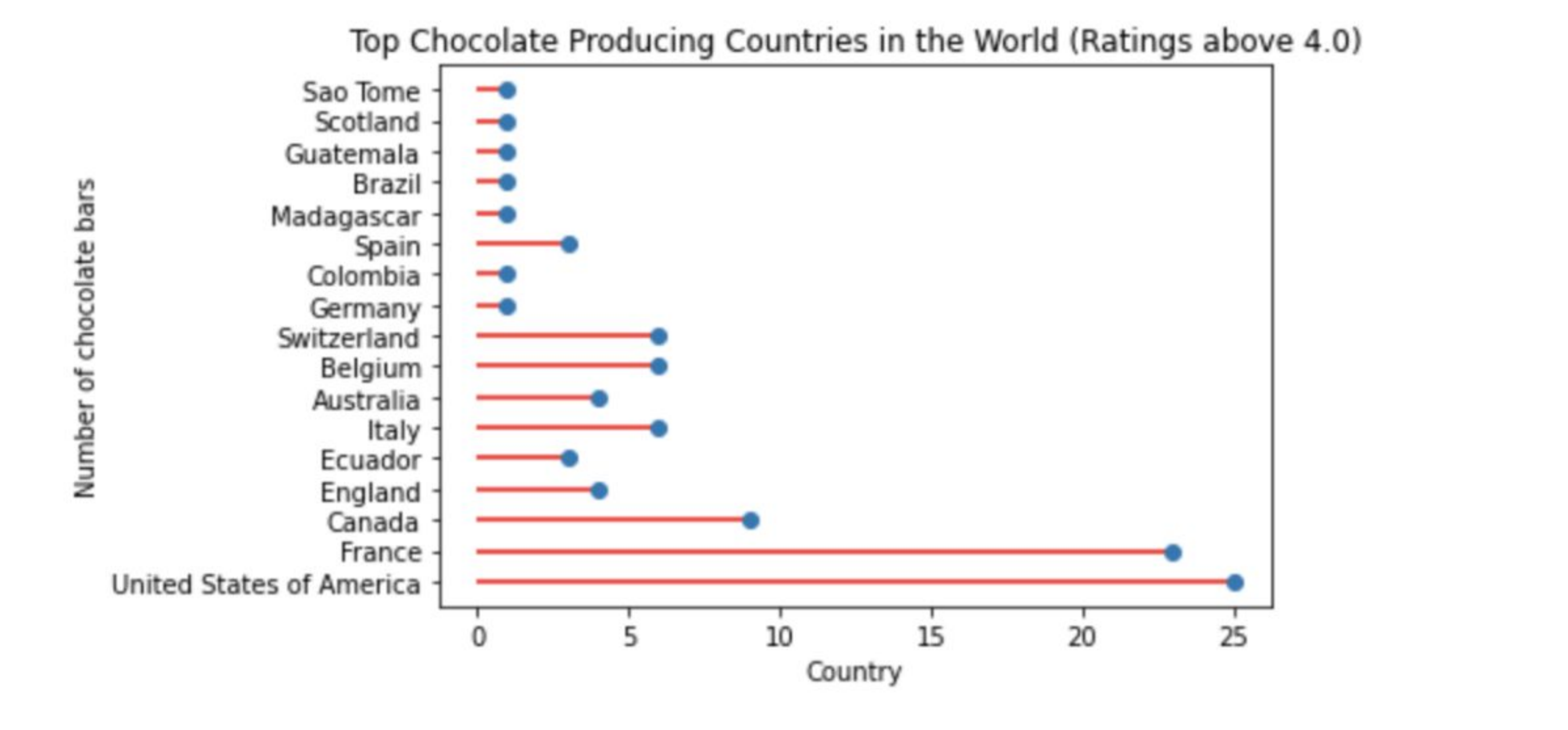


```
Broad_Bean_Origin
Venezuela                                                        5.0
Madagascar                                                       4.0
Dominican Republic,Madagascar                                    4.0
Guatemala,Dominican Republic,Peru,Madagascar,Papua New Guinea    4.0
Guatemala                                                        4.0
Grenada,Papua New Guinea,Hawaii,Haiti,Madagascar                 4.0
South America                                                    4.0
St Lucia                                                         4.0
Peru                                                             4.0
Ghana                                                            4.0
Name: Rating, dtype: float64
```

Does Cocoa % lead to better bar rating



Best chocolate producing country


Top Chocolate Producing Countries in the World (Ratings above 4.0)
Sao Tome
Scotland
Guatemala
Brazil
Madagascar
Spain
Colombia
Germany
Switzerland
Belgium
Australia
Italy
Ecuador
England
Canada
France
United States of America
Country
Number of chocolate bars