Final Project

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Overview

WHO IS OUR TEAM?

Lindsay MacDonald

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WHAT IS THE TOPIC?

Influence of demographics on the homicide solve rate in California.

WHY THIS TOPIC?

Data Sources

U.S. Homicide Reports, 1980-2014

https://www.kaggle.com/jyzaguirre/us-homicide-reports

US Census Demographic Data

https://www.kaggle.com/muonneutrino/us-census-demographic-data/data?select=acs2015_county_data.csv

Questions to Answer

- Is there a correlation between the personal attributes of the victim and the solve rate?
- Is there a correlation between county demographics where the murder occurred and the solve rate?
- Can we develop a machine learning model that predicts whether or not a crime would be solved given hypothetical sets of circumstances?

Data Exploration: Preprocessing

Kaggle Dataset #1 (US Homicide Reports, 1980-2014)

- Filtered ‘State’ column for California
- Renamed ‘City’ column as ‘County’ in order to merge with with the second dataset
- Dropped irrelevant columns
- Checked for null values (0)

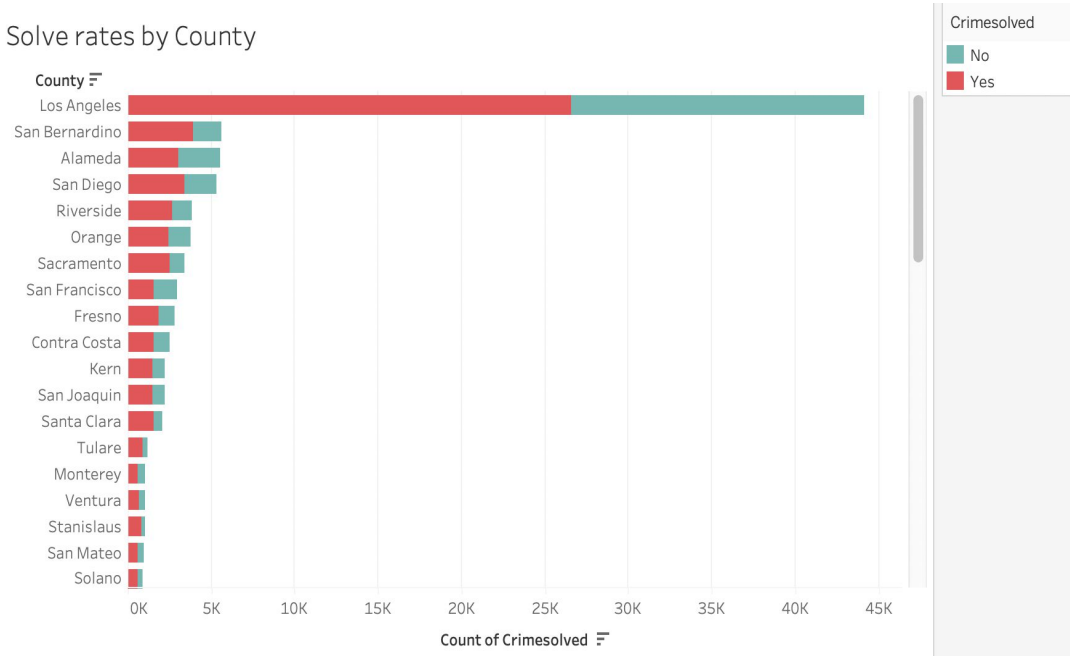
Kaggle Dataset #2 (US Census Demographic Data)

- Filtered ‘State’ column for California
- Dropped irrelevant columns
- Checked for null values (0)

Datasets were imported into Postgres and joined; merged dataset was then uploaded to AWS S3 bucket

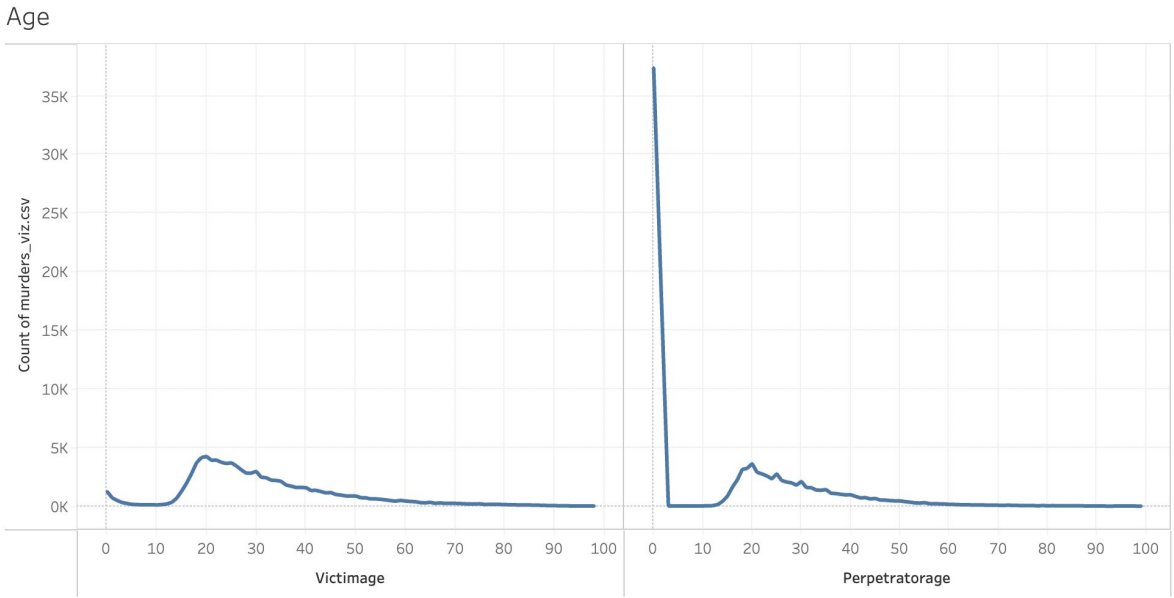
Data Exploration: Initial Findings

Due to the population disparity among counties in CA, a vast majority of the data was for Los Angeles county

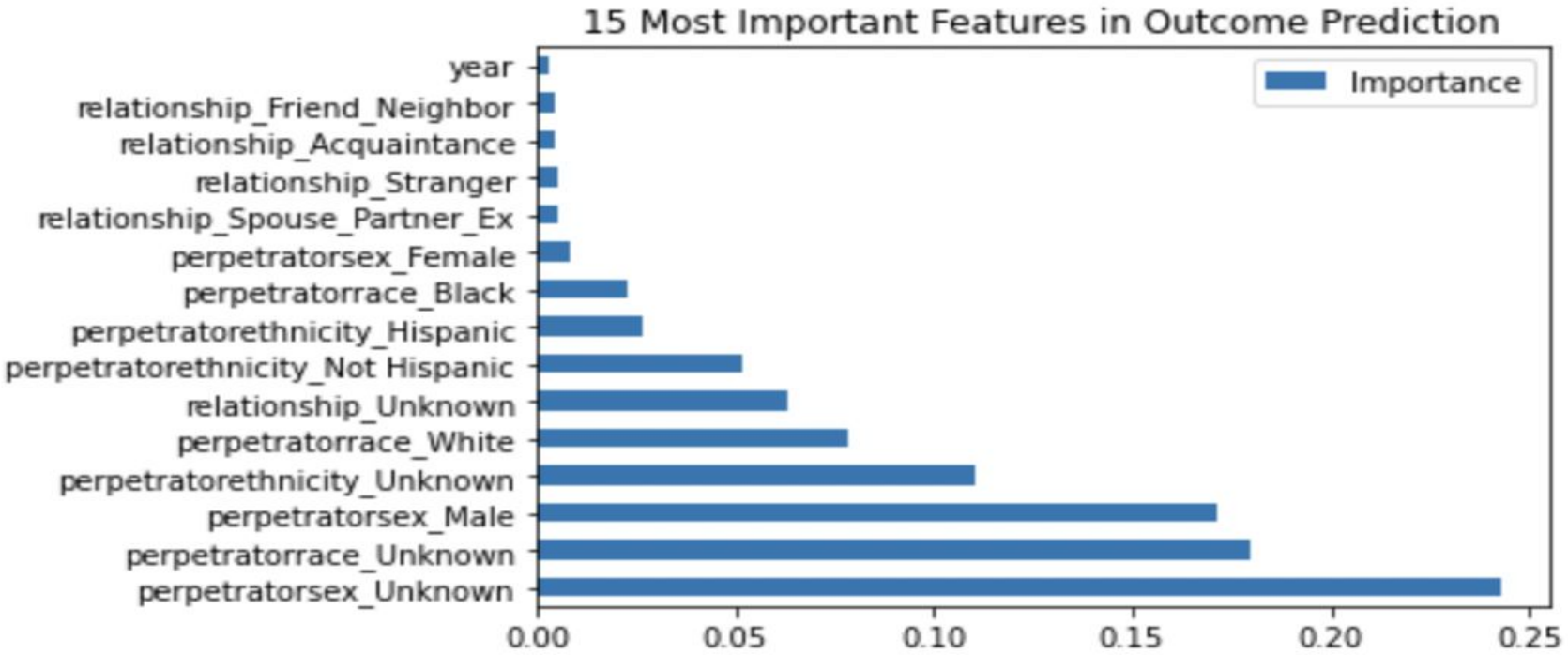


Data Exploration: Initial Findings

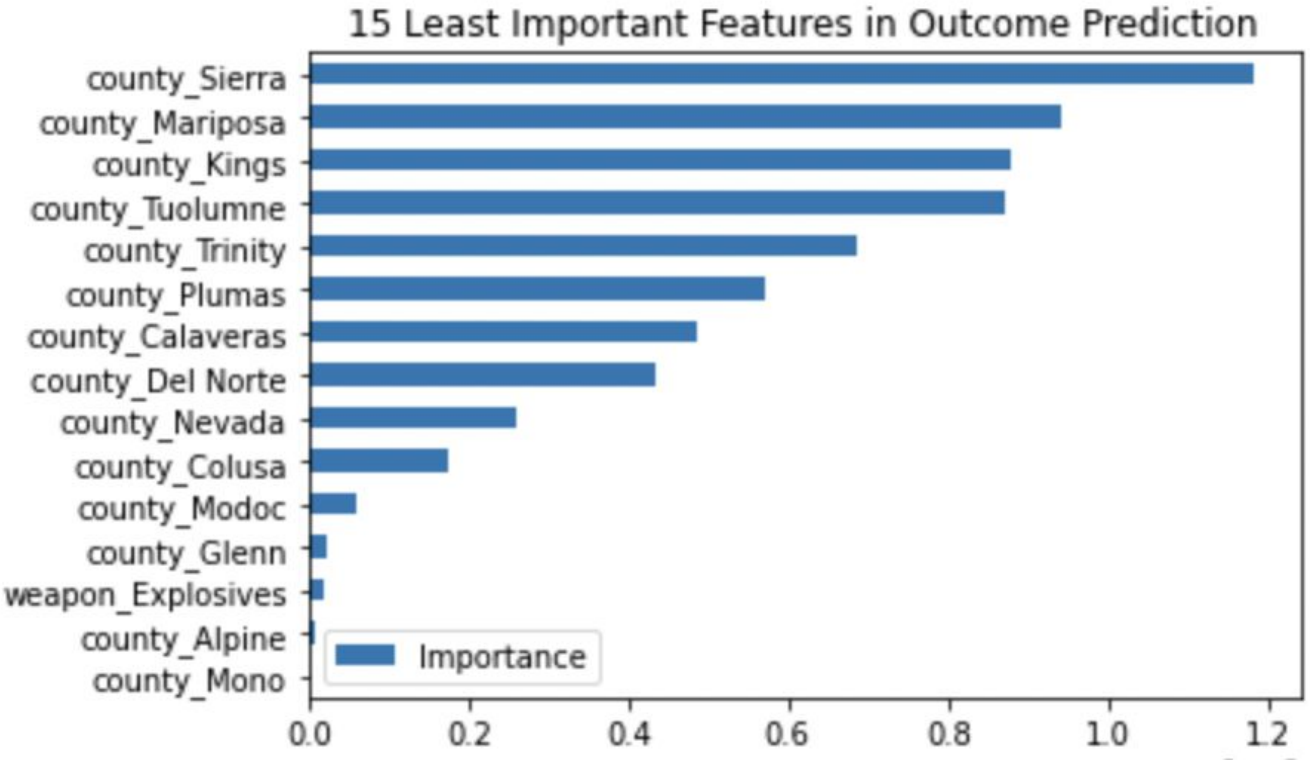
There is an unusual amount of records capturing an age of 0 for perpetrators which suggests these individuals were largely unidentified and therefore their age was unknown



Analysis


15 Most Important Features in Outcome Prediction
Importance
year
relationship_Friend_Neighbor
relationship_Acquaintance
relationship_Stranger
relationship_Spouse_Partner_Ex
perpetratorsex_Female
perpetratorrace_Black
perpetratorethnicity_Hispanic
perpetratorethnicity_Not Hispanic
relationship_Unknown
perpetratorrace_White
perpetratorethnicity_Unknown
perpetratorsex_Male
perpetratorrace_Unknown
perpetratorsex_Unknown
0.00
0.05
0.10
0.15
0.20
0.25

Analysis


15 Least Important Features in Outcome Prediction
county_Sierra
county_Mariposa
county_Kings
county_Tuolumne
county_Trinity
county_Plumas
county_Calaveras
county_Del Norte
county_Nevada
county_Colusa
county_Modoc
county_Glenn
weapon_Explosives
county_Alpine
county_Mono
Importance
0.0
0.2
0.4
0.6
0.8
1.0
1.2