Introduction

This part of the project entails choosing a dataset and formulating a set of analysis that could give some insight into the chosen dataset.

The chosen dataset recorded the police stops under *Terry v. Ohio*, 392 U.S. 1 (1968) which is a decision by the Supreme Court of the United States. This is to guide police officers when making stops to search a suspect who has committed, is committing or is about to commit a crime. As shown in figure 1, the dataset contains the demographics of the suspect and officer involved. This is done to aid employment purposes when background check is done on an applicant. Over a period of years, the analysis will give an insight into how police stops and searches are conducted across suspects races, and the time periods those stops took place.
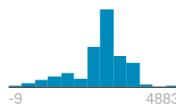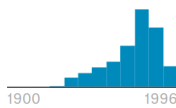

Figure 1: Screenshot of few rows and columns of dataset

Dataset Description

Number of Rows: 26,043

Number of columns: 23

Size: 5MB

Source: [Seattle Police Stops, Open Data](#)

Loaded Rows: 26,043

Loaded Columns: 11

Size: 2.17MB

Column Description

1. Subject Age Group: Range of age groups for the suspects.
2. Stop Resolution: The resolution made by the officer after the stop.
3. Officer ID: Key identifying unique officers in the dataset.
4. Officer YOB: Year of Birth of the reporting Officer.
5. Officer Gender: Gender of the reporting Officer.
6. Officer Race: Race of the reporting Officer.
7. Subject Perceived Race: The age of the Suspect as reported by the Officer.
8. Subject Perceived Gender: The gender of the Suspect as perceived by the Officer.
9. Reported Date: The date the report was entered into the Record Management System (RMS).
10. Reported Time: This is the time the record was entered into the RMS.
11. Arrest Flag: Takes account of whether an arrest was made or not for the intended suspect.

Formulated Analysis

1. To find out the number of stops made to various races according to their age range.

   - For instance, how many **Whites** within the age of **26 – 35** have been stopped across the whole record and so on for other **races** and **age ranges**.

2. Using the time stamps, divide them into four periods of the day (Early Morning, Morning, Afternoon and Evening. Obtain the number of stop-search occurrences within these time periods.

   - For instance, in how many stops were made in the mornings, evenings or afternoons of 2015. Compute for other years respectively.

3. Compute the percentage of each Suspects race, stopped by an Officer race of a particular race or another.

   - For instance, for all stops by an Asian Officer, what percentage of the Suspect is White?

Task 1 Implementation and result

This task is to find out the proportion of races that are stopped and searched, according to their age ranges.

The pig script for *implementation* is contained in a well annotated *part3_question1.pig* file.

The output in table 1 below, shows the top 10 order of the Suspects Races and the number of stops according to their age ranges. Whites between the ages of 26 – 35 had the highest stop count of 4652, followed by those within the ages of 36 – 45 and subsequently 18 – 25 years of age. Blacks and other Races subsequently followed suit. The rest of the result is in a *part3_question1_answer.txt* file. The results show that whites were more likely to be stopped and searched compared to other races. Across the whole output, Suspects between the age of 26 – 35, across all races are most likely to be stopped and searched.

Subject_Perceived_Race	Subject_Age_Group	Count
White	26 – 35	4652
White	36 – 45	2736
White	18 - 25	2576
Black	26 – 35	2283
Black	18 - 25	2018
White	46 - 55	1671
Black	36 - 45	1420
Black	46 - 55	1045
Black	1 - 17	710
White	56 and Above	643

Table 1: Top 10 list of Races and stop counts by Age group

Task 2 Implementation and Result

This task is geared towards getting an insight into the period of the day when most of the searches likely occur. The time stamps were divided into four parts from which the count of the various stop-searches is recorded.

The pig script for *implementation* is contained in a well annotated *part3_question2.pig* file.

A *macros* in *yearTimeMacro.pig* file is defined to compute the *counts* for the various years. This helps to avoid repeating the computation 4 times, for the various time periods.

Knowing the times that most searches took place could give an insight into when suspects are more likely engaging in a crime. From the result in table 2 below, it shows that most of the searches were at the time of the day when it is still dark. However, in 2018, the number of overall stop-search reduced significantly.

Year	earlyMorningCount	morningCount	afternoonCount	eveningCount
2015	1789	1336	1957	1967
2016	1863	1512	2077	2035
2017	2045	1292	1880	2038
2018	1146	751	1158	1196

Table 2: years and count of the various search periods in the day

Task 3 Implementation and Result

For this task, there is need to have an insight into how often a police officer is likely to stop a suspect based on race.

A *part3_question3.pig* contains the code used to implement the result formulated analysis. The rest of the result is contained in a *part3_question3_answer.txt* file.

officerRace	Subject_Perceived_Race	Suspects race(%)
American Indian/Alaska Native	Black	43.6
American Indian/Alaska Native	White	37.0
American Indian/Alaska Native	Multi-Racial	7.0
American Indian/Alaska Native	American Indian / Alaskan Native	5.3
American Indian/Alaska Native	Asian	4.5
American Indian/Alaska Native	Hispanic	2.1
American Indian/Alaska Native	Other	0.4
Asian	White	57.8
Asian	Black	27.6
Asian	Hispanic	5.4
Asian	American Indian / Alaskan Native	3.6
Asian	Asian	3.0
Asian	Multi-Racial	2.3
Asian	Other	0.2
Black or African American	White	47.8
Black or African American	Black	35.8
Black or African American	Hispanic	7.5
Black or African American	American Indian / Alaskan Native	4.1
Black or African American	Asian	2.6
Black or African American	Multi-Racial	1.5

Table 3: First 20 list of Officer races and the percentage of stops for various Suspects race.

The result in table 3 shows that an (American Indian/Alaska Native) is more likely to stop a Black suspect, from the result the officer stopped a Black suspect 43.6% of the time. A (Black or African American) officer is more likely to stop a White suspect 47.8% of the time and a White Officer is more likely to stop a white suspect 52.9% of the time and so on for other Officer races. It can be inferred that an officer may be biased in deciding on which race of suspect to stop in order to make a search.

Conclusion

The analysis performed on this dataset using pig is quite insightful. Suspects within the ages of 26 – 35 are more likely to be stopped. An Officer is more likely to stop a suspect that belongs to a race. For the time periods, suspects were stopped more at dark hours. More analysis can still be done to gain insight into the dataset. Like looking at the age of the officers and type of reports they gave after a stop-search.

Bibliography

White, Byron Raymond, and Supreme Court Of The United States. *U.S. Reports: Terry v. Ohio, 392 U.S. 1*. 1967. Periodical. Accessed 11th November 2019, www.loc.gov/item/usrep392001

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