

SCHOOL OF INFORMATION AND    
COMMUNICATION TECHNOLOGY

DA4310 DATA SCIENCE

**Report, Source Code & Presentation**

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22FTT1360

Semester 4

Academic Session 2024/2025

January 2024

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# INTRODUCTION

The purpose of this report is to showcase a Dashboard Web Application with the use of Streamlit Python Coding. The dashboard displayed in this report will contain meaningful interactive visualizations and analysis of a chosen dataset. The dataset chosen is about the overall gun violence in America from the year 2012 to 2014.

According to EveryTownResearch,**120 Americans are killed with guns and more than 200 are shot and wounded. This is why it’s important to analysis and discover insights on why these deaths occur and what can be done to reduce the casualties.**

**PROBLEM STATEMENT**

There is a lack of awareness in America as to the outcome and factors relating to gun violence.

**AIMS OF THIS DASHBOARD**

The main aim of this dashboard is to provide insights and additional analysis as to the reasons why the gun violence in America is high through meaningful visualizations. This focuses on three (3) main objectives.

* Analyze data to discover where gun violence in America occurs the most.
* Identify groups/individuals that are most affected due to gun violence.
* Raise awareness on other factors contributing to gun violence.

**APPLICATION OVERVIEW**

The main dashboard will consist of six (6) visualizations that uncover insights on various factors that affect the gun violence in America. The visualizations will cover many important conditions of the overall deaths that occur due to gun violence.

The Dashboard will also allow users to interact with various filters which alters the output charts/visualizations in the web application to get a better grasp of the data being dealt with.

# MAIN DASHBOARD

Below are the six (6) visualizations from the main dashboard with detailed descriptions and insights.

A graph with a red line

Description automatically generated with medium confidence

Figure 1 - Age Distribution of Victims

The histogram above shows the age distribution of victims along with the victim’s race. This histogram plays an important role in data exploration since it outlines the groups/individuals of people according to the ‘age’ and ‘race’ of the victims. From this histogram alone, it can be deducted that the group of people that is mostly affected by gun violence are of the ‘White’ race with the ‘age’ range between 50-55 years old.

**Filters implemented:**

* Multiselect box for choosing the victim’s ‘race.’
* Range slider to modify the range of the victim’s ‘age.’
* Slider to adjust the Bin size of the histogram.

A screenshot of a graph

Description automatically generated

Figure 2 - Location & Intent of Victims

The segments of the donut chart above show the ‘intent’ of how the victims had died due to gun violence. This chart is important as it highlights the main ‘intent’ of victims in each location the death occurred. Additionally, the chart allows users to view the data that occurred in specific years between 2012-2014. It can be seen from this donut char that the leading ‘intent’ of death due to gun violence is Suicide, where the victims willingly take one’s life away.

**Filters Implemented:**

* Select box to choose the ‘place’ of where the death occurred.
* Select box to choose what year the incident takes place.

A screenshot of a graph

Description automatically generated

Figure 3 - Age of Victims by Education Level

The figure above shows yet another histogram. However, this histogram outlines the ‘education’ level of the victim instead of the ‘race’ as seen in- Figure1*.*  The histogram in Figure 3 is just as important because it outline what age that groups/individuals are most affected by gun violence due to gun violence. It be deducted from the figure above that gun violence are most affected to individuals who are ‘High School Graduates’ between the ‘age’ of 20-30 years old.

**Filters Implemented:**

* Range slider to modify the range of the victim’s ‘age.’
* Select box to select the ‘intent’ of the victim’s death.
* Select box to select the ‘race’ of the victim.

A graph of a line

Description automatically generated with medium confidence

Figure 4 - Trend in Gun Violence Over Months

The line chart in Figure 4 represents the trend of deaths due to gun violence over the months from the year 2012-2014. It is important to analyze the trends using within in line chart because it highlights whether there is any relationship between victim’s deaths in specific months. The line chart reveals that the month that has the most occurrences of gun violence is in the month of July. While the month that has the lowest amount of gun violence is February. This suggests that there is a seasonal pattern found within gun violence in Ameica.

Filters Implemented:

* Select box to select the ‘intent’ of the victim’s death.
* Select box to select the ‘race’ of the victim.

A screenshot of a graph

Description automatically generated

Figure 5 - Gun Violence Incidents by Location & Intents

In Figure 5, this bar chart shows the gun violence incidents by location & intents of the victim. Meaning users can get to understand where the most deaths of gun violence occur along with what are the intents behind the casualty. In this case, the bar chart highlights well that the ‘place’ with most occurrences of gun violence is within the ‘Home’ of the victim with the ‘intent’ of ‘Suicide’. It can also be seen that in the ‘Street’ location, there are more occurrences with ‘Homicide’ rather than ‘Suicide’.

**Filters Implemented:**

* Multiselect option for the ‘place’ of death.
* Multiselect option for the ‘intent’ of death.

A screenshot of a graph

Description automatically generated

Figure 6 - Death Trends by Intent Overtime

The stacked area chart in figure 6 shows the number of deaths by intent overtime. This graph makes use of the total height of the stacked areas on the horizontal axis to determine the number of victims. This means the more area/color shown in the graph then it is most dominant. It can be seen from the chart that ‘Suicide’ has the most occurrences along with ‘Homicide’ with a similar trend over the months, showing interest in the months of February and July which is further backing up what is discovered in figure 4.

Filters Implemented:

* Range slider to adjust the time frame between 2012-2014.
* Multi select box for the ‘intent’ of victims.

# USER MANUAL

This section of the report helps to guide users on how to utilize the filters provided to properly navigate through the main dashboard and discover insights.

**MULTISELECT BOX**

A white rectangular object with red border

Description automatically generated

Figure 7 - Multi Select Box

The multiselect box allows users to filter out the options on what is to be displayed in the visualizations. For example, users may choose to only display the ‘race’ of ‘White’ and ‘Black’ rather than showing all the ‘races’.

**RANGE SLIDER**

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Figure 8 - Range Slider

The range slider filters are slider filters with two (2) movable ends. In this case the user can adjust the slider to only show the desired range to be displayed in the visualization. For example, a user may want to analyze the age range of victims between 18-30 years old rather than the overall 0-100 years old.

**SLIDER**

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Figure 9 - Slider Filter

This slider filter in figure 9 varies

# RECOMMENDATIONS

# CONCLUSIONS

# REFERENCE

*Gun Violence in America*. (2023, August 8). Everytown Research & Policy. https://everytownresearch.org/report/gun-violence-in-america/