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| **Design Brief** |

**Project Title: 3.2.7 Investigating with Data**

**Client:** Jonathan Castro, Erick Torres

**Designer(s):**  Robert Navarro, Robert Saucedo

**Problem Statement:**

Crime is a national problem which has to be controlled. Crime has declined in more recent years but it still is a huge problem for America in some cities more than others. As Eric Lichtblau and Monica Davey mentioned in their New York Times article that “New York saw a 25 percent drop, while Las Vegas’s homicide total nearly doubled.” No one can be sure whether crime rate change is caused by “the heroin epidemic, a resurgence in gang violence and economic factors”, but we know that crime is a problem and it must be contained. Crime can range from theft to more severe cases like murder or drug distribution. Crime can be reduced simply by expanding law enforcement in certain areas but sometimes there are not enough resources. This is why law enforcement organizations have relied on technology to help reduce the crime rate. Cameras, radios, and maps are just a few of the things which police use to help them apprehend criminals. Over time, technology has advanced which has allowed to make it easier for law enforcement to catch criminals.

**Source:**

Lichtblau, E. & Davey, M. (May 13 2016). Homicide Rates Jump in Many Major U.S. Cities, New Data Shows. New York Times.

Retrieved from https://www.nytimes.com/2016/05/14/us/murder-rates-cities-fbi.html?\_r=0

**Design Statement:**

The client will be provided with a visualization demonstrating the relationship between the total amount of crimes committed and time. Four visualizations will be created from the same data, ranging from 1960 to 2015, regarding crime rates in the United States. Four visualizations will aid in helping the client understand the relationship between the two variables. The four types of visualizations that are being created for the client are a time plot, bar graph, scatter plot, and boxplot. The time plot can be used to show the change in the amount of crimes committed over time while the bar graph can be used to identify which years had the most crime. The scatter plot indicates the correlation between time and amount of crimes committed. The boxplot shows the median amount of crime as well as the minimum and maximum. The client is going to be provided with an easy-to-understand and visually pleasing display of data. In order to do this, pastel colors that stand out to viewers of the visualizations are going to be utilized. Data visualization is a form of art, and that message is going to be presented to the audience.

**Constraints:**

* **there are undocumented crimes committed in the US, so data is not completely accurate**
* **data only goes back to 1960 (when records began), so it is limited**
* **data does not account for population growth**
* **design must be visually appealing**
* **must be able to portray the data correctly**

**Sources:**

http://www.disastercenter.com/crime/uscrime.htm

<https://ucr.fbi.gov/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/tables/1tabledatadecoverviewpdf/table_1_crime_in_the_united_states_by_volume_and_rate_per_100000_inhabitants_1993-2012.xls>

**Conclusion:**

The client never provided a clear problem so it was difficult to pinpoint exactly what they wanted. The problem was interpreted as “As years pass does the crime rate decrease?”. The problem was interpreted this way to back up the client’s claim that crime rate is decreasing. The results were used to create four graphs. The time plot showed that crime peaked in the 1990’s. The bar graph showed a graph that was skewed to the left. The scatter plot displayed a nonlinear pattern. A representation of the median, min, and max values were shown by the boxplot. The time plot showed that the lowest amount of crime was in 1960 which was about 3 million. It began going back down after reaching the peak in the 1990’s. The data begins in the 1960’s because this was the time when a lot of data started getting tracked for the first time. The bar graph says that crime was increasing in some years and decreasing in others. The scatter plot indicates that there is a very low amount of correlation between time and crime rate. The R2 value that was calculated was 0.320194. The boxplot indicates that the minimum amount of crime was at around 3 million, the median was at about 11 million, and the maximum was around 15 million. All of the results show that crime didn’t initially decrease but it has been decreasing from the peak so they do answer the question. A possible lurking variable could be the amount of police officers per year. The results could be considered erroneous because of the fact that every crime can't be tracked. Some crimes go unreported.