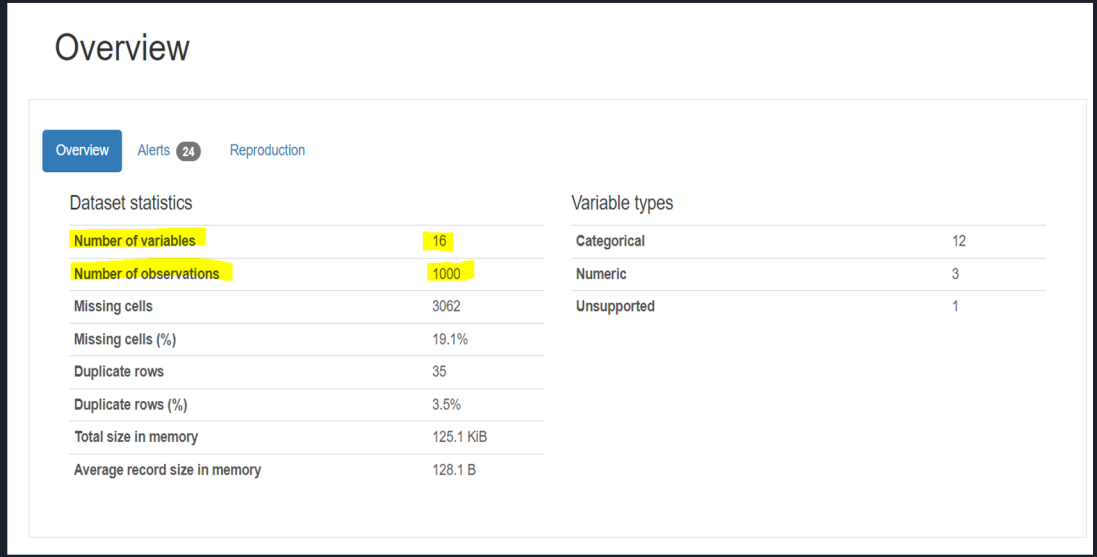
BALTIMORE 911

Overview of Baltimore 911 Dataset

- The data provided gives information on the total number of crime incidents reported during the months of January and February of 2020.
- It contains details on crime type, crime time, premise among many others.
- In total we have 16 features and 1000 number of observations .



Detailed Profile of Each Variable

- The below table provides details on the type of each variable, unique values that the variable may hold and the attributes that are repeated the most if it is a categorical type.
- It also gives the minimum, maximum, mean, median and standard deviation values if it is a real number.
- It provides details on the level of missingness for each of the variables.
- Total Incidents is the only logical column in terms of being numeric with minimum value 0 and maximum value 1.

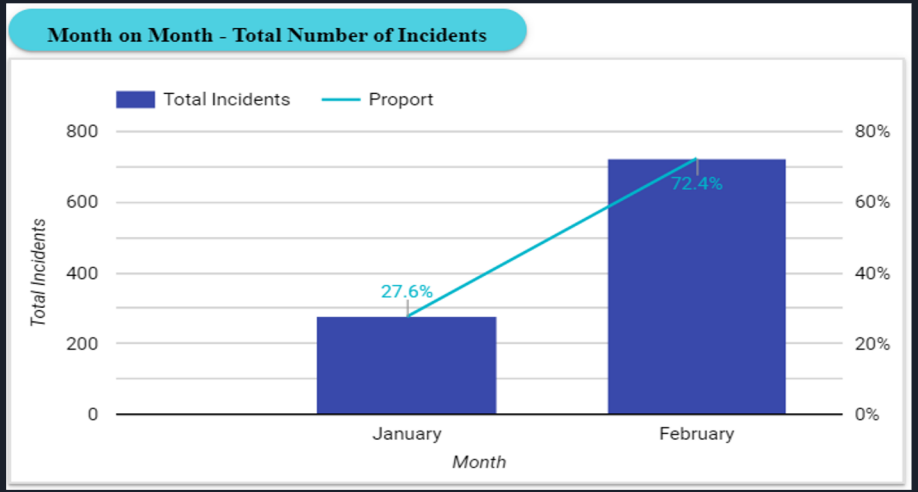
Variable	Type	Unique Values	Attributes with Largest Count	Missingness(%)
CrimeDate	Categorical	0	02/01/2020, 02/03/2020, 01/30/2020	0
CrimeTime	Categorical	262	18:00:00, 19:00:00, 20:00:00	0
CrimeCode	Categorical	8	4E, 6D, 7A	0
Location	Categorical	730	2400 FREDERICK AVE, 4000 Sinclair Ln, 5200 BELAIR RD	0.1
Description	Categorical	0	LARCENY, COMMON ASSUALT, LARCENY FROM AUTO	0
Inside/Outside	Categorical	0	I, O, Outside	16.7
Weapon	Categorical	0	FIREARM, OTHER, KNIFE	77.6
Post	Real number			0.4
District	Categorical	1	NORTHEAST, SOUTHWEST, SOUTHEAST	0
Neighbourhood	Categorical	39	FRANKFORD, BELAIR-EDISON, DOWNTOWN	7.6
Longitude	Real number			0.4
Latitude	Real number			0.4
Location 1				100
Premise	Categorical	14	STREET, ROW/TOWNHOUSE-OCC, APT/CONDO - OCCUPIED	16.7
vri_name1	Categorical	0	Western, Eastern 1, Tri-District	86.3
Total Incidents	Categorical	0	1	0

Unique Findings From The Data Profile

- The variables Location 1 and vri_name1 have a missingness percentage of 100% and 86.3% each and seem to have no relevance with the data required for analysis. These can be removed from the data set to ensure better decision making.
- It is notable that most of the crimes were taking place between 6:00 PM and 8:00 PM.
- It is interesting to note that out of all the weapons, most of the crimes were happening with firearms and knives as the choice of weapons.
- Most of the crimes were taking place in the northeast, southwest and southeast districts.
- Within the Inside/Outside column, data cleaning is required as there are alias present. For e.g Inside is termed as Inside as well as I.
- There are multiple column describing location and can be further optimized.
- Total Incident column has same value throughout and can be skipped

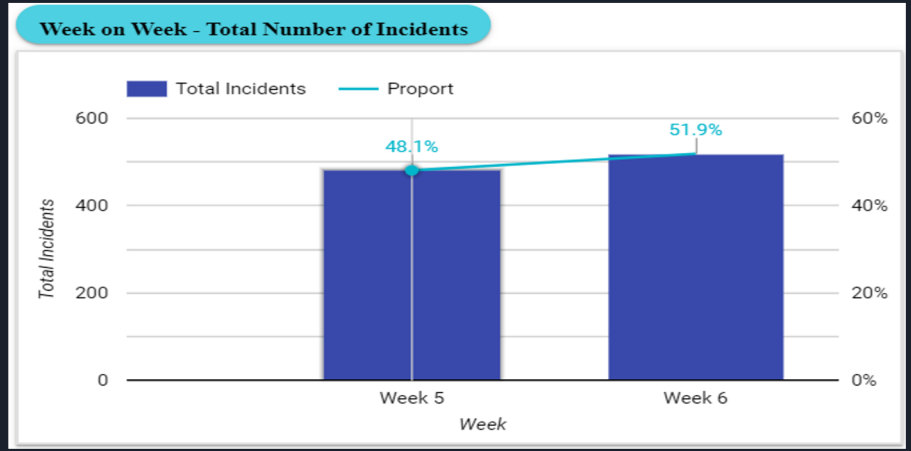
Month on Month Crime Distribution Aggregating From All Geo-Locations

- The graph provides information about the total number of crime incidents between January and February 2020 aggregating from all geo-locations.
- The total number of incidents have tremendously exponentially increased from January to February.
- The incidents in January were only 276 while in February there were 724 showing an alarming increase of 448 incidents in the span of a month.



Week on Week Crime Distribution Aggregating From All Geo-Locations

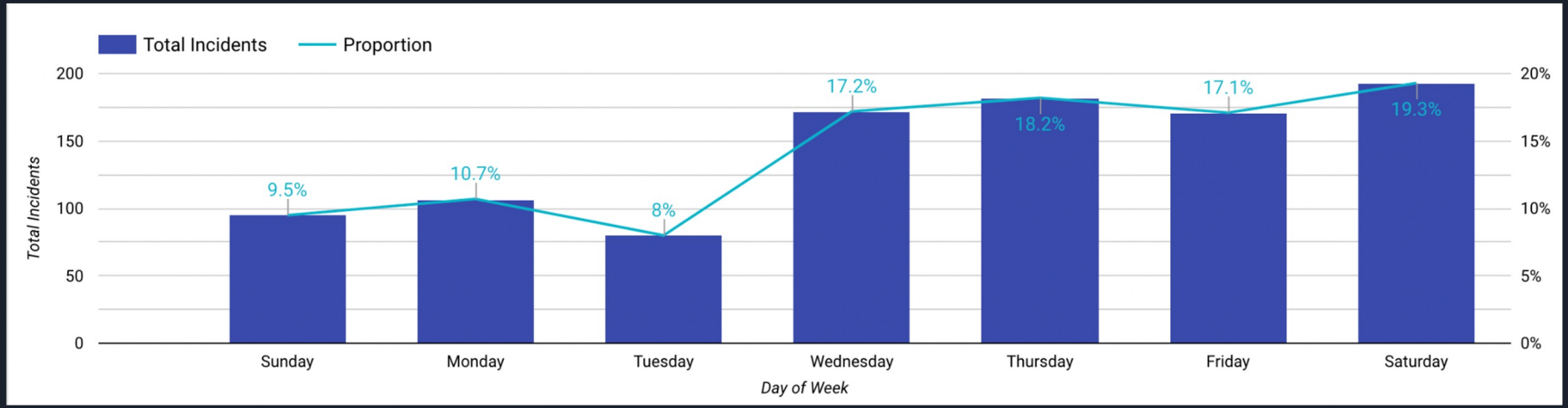
- The graph gives insights on how the crime incidents have been on a week on week basis.
- It can be observed that the total number of incidents have increased on a weekly basis.
- The incidents have increased by 38 from week 5 to week 6.



Note

Year to Year - Total Number of Incidents : As the data is generated from just two week's worth of observations, plotting a year to year graph can be ignored as it would have no data points to compare with.

Day of the Week Wise Categorization of Total Number of Incidents



The graph gives information on how the crime incidents are spread throughout a week. Further insights on next slide.

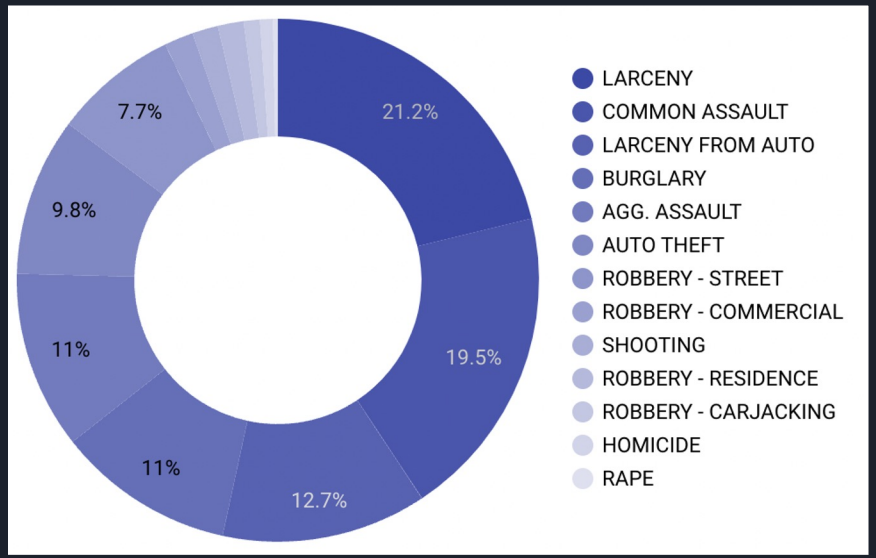
Day Wise Categorization continued:

The graph gives information on how the crime incidents are spread throughout a week.

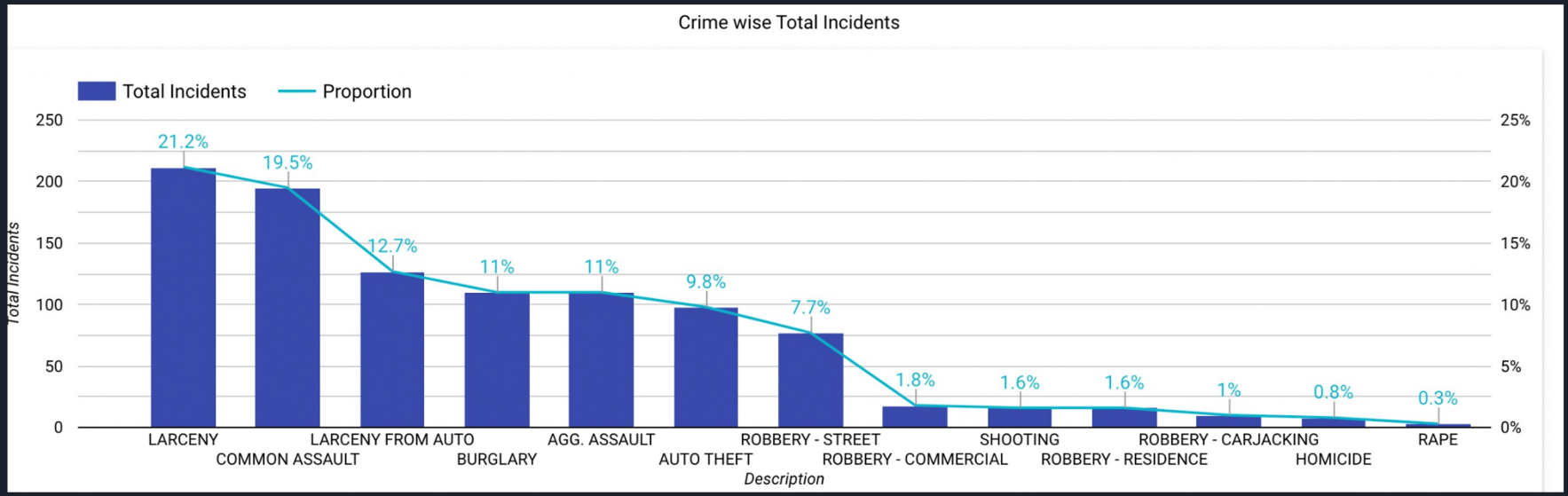
- The crime incident rate is the lowest on Tuesday with it being at 8% while the highest is found to be on Saturday with the rate being a little over 19%.
- The second lowest incident rate is found to be on Sunday when the rate is approximately 9%.
- Moving on from Sunday to Monday, an increase of 1.7% has been seen in the incident rate.
- Thursday proved to be the second highest with incident rate at 18.2%.
- However, there is not much of a difference in the rates observed on Wednesday and Friday as they stand at 17.2% and 17.1% respectively.
- More importantly, crime rate being high on Saturday is because of the proportion of the rate in the month of February. There are minimal crime on Saturday in month of January.
- Overall as the data points are small and duration is low, it is difficult to take a judgement on day of the week.

Overall Distribution of Crime Type by Aggregating All Geo-Locations

1. To analyse the overall month to month pattern we have created a pie chart which shows the crime codes and its description.we can group the data by the number of crime codes.
2. The highest crime incident is Larceny which 21.2% of the total followed by crime with the crime code 4E - common assault, which is 19.5%.
3. The minimum crime incident is Rape, 0.3% of the total.
4. The monthly pattern suggest that there are a few factors that contribute to the variation in crime which can be known from the crime code and its description.



Distribution of Crime Type Aggregating from All Geo-Locations And All Time Periods



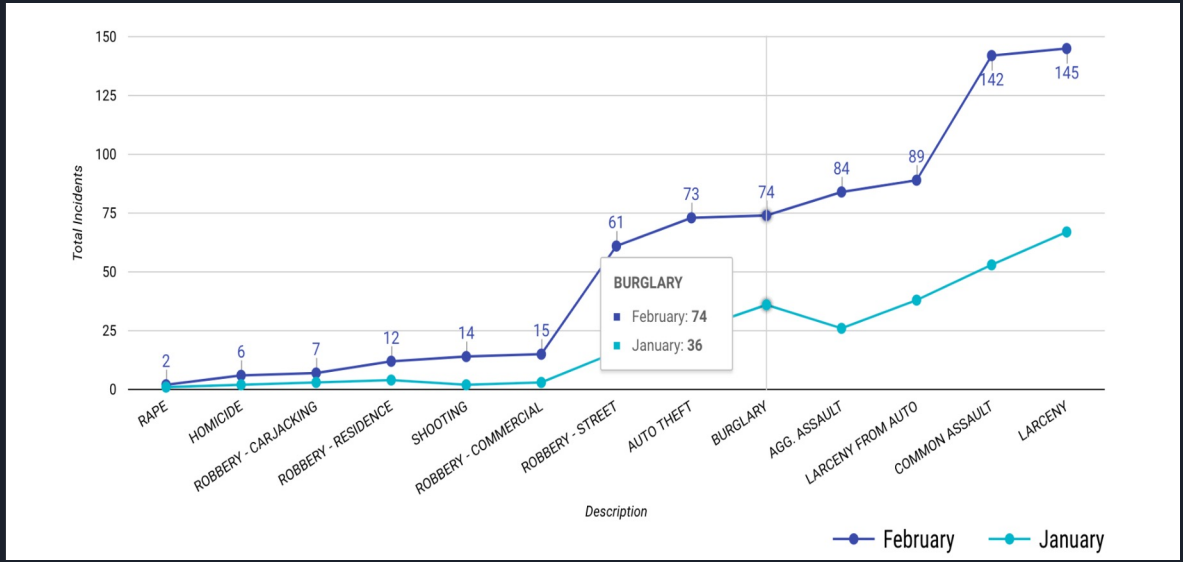
The insights from the above graph can be seen on the next slide.

Distribution of Crime Type Aggregating from All Geo-Locations And All Time Periods Continued

- To describe the distribution of crime type aggregating from all geo locations and all time periods we can see that the graph includes information on various types of crimes reported in baltimore city with the maximum of robbery which includes maximum of crime type Street Robbery, Residence robbery, Commercial robbery, and Carjacking.
- Other types of crime like larceny, common assault, agg. Assault and homicide can also be seen but are very high as compared to above mentioned crimes.
- Overall the distribution of crime type indicate that there is a wide range of incidents reported to 911 in baltimore city with some type of crimes being more common than others.

Month on Month Crime Type Distribution

- By comparing the line graph for different months, we can observe how the distribution of crime types varies throughout the 2 months.
- We can analyze the distribution of crime types for January and February months, In both the months the most common types of crime are Larceny and common assault.
- The least crime when compared with both months January and february are Rape and Homicide, which has the most less number of incidents.

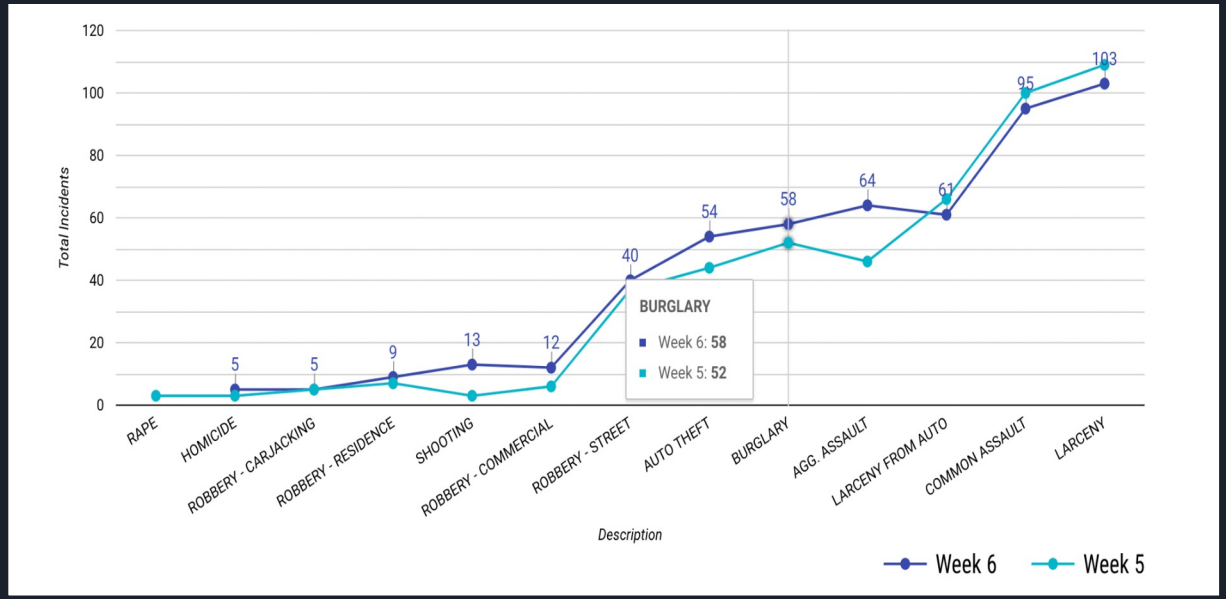


Week on Week Crime Type Distribution

1.Tracking crime trends on a week-by-week basis can provide valuable insights into short-term fluctuations in criminal activity.

2.After analyzing total incidents vs description on a week-by-week basis we can see that week 5 has more number of common assaults and larceny as compared to week 6.

3. It can be seen that the crime type, Rape is the least in week 5 while Homicide being the least in week 6.



Crime Type Distribution by Day of the Week

	DOW / Total Incidents						
Description	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
LARCENY	18	24	15	39	46	32	38
COMMON AS...	19	22	18	29	38	30	39
LARCENY FR...	12	15	9	29	21	21	20
BURGLARY	5	6	11	27	22	21	18
AGG. ASSAULT	12	11	6	12	17	27	25
AUTO THEFT	8	12	7	16	16	19	20
ROBBERY - S...	12	10	6	11	11	10	17
ROBBERY - C...	3	1	3	5	2	2	2
ROBBERY - R...	1	2	3	1	4	-	5
SHOOTING	1	2	-	2	-	4	7
ROBBERY - C...	2	1	2	-	2	2	1
HOMICIDE	1	1	-	1	2	3	-
RAPE	1	-	-	-	1	-	1

The graph gives information on how the crime incidents are spread throughout al days of the week. Further insights are on the next slide.

Crime Type Distribution by Day of the Week Continued

- We can observe how the relative frequency of different types of crime varies and identify potential patterns or trends. This information can be useful for understanding the nature of crime in Baltimore City and for informing strategies for addressing specific types of crime.
- We may observe that certain types of crime are more common on weekends compared to weekdays, or that the frequency of certain types of crime changes depending on the time of day (e.g. more common during evening hours).

A dynamic dashboard with data visualisation has been curated. The link to which is given below.

DASHBOARD

THANK YOU