DV Assignment 2

Here we need to identify a dataset of interest and perform an exploratory analysis to better understand the shape & structure of the data, investigate initial questions, and develop preliminary insights & hypotheses. My final submission is in the form of a report consisting of captioned visualizations that convey key insights gained during my analysis.

Here we need to analyze the necessary data and conduct research to better understand the shape and structure of the data, investigate the first questions, and create the first insights and solutions. My final presentation is contained in a report containing graphs showing the key information I gained during my analysis.

DATASET:

Chicago Crime, 2001-Present .This data shows crimes committed in the city of Chicago from 2001 to the present (for all victims except murder), excluding the last seven days. Data provided by the Chicago Police Department's CLEAR (Citizen Law Enforcement Analysis and Reporting) system. It is a web-based application that allows the public to access criminal records. Here I need to do 7-day annual compression by removing the last few days from 2017 to 2023 as there are more than 7.9 million records in the dataset. Crime - 2001-Present - Dashboard City of Chicago Data Portal - Link to Dataset. Records include date, time, location, type, description, incident, incident, community area, ward, region, attack and block location, illegal, latitude and longitude coordinates of the location. The crime occurred somewhere. It is dynamic data that we can access through the City of Chicago Data Portal.

INITIAL ANALYSIS QUESTIONS:

1. How have the number of various crimes in Chicago changed over time?

2. What are the different types of crimes?

3. How has the number of people arrested for crimes changed in Chicago?

4. Which areas have high crime rates?

5. Which day should you pay attention to because that day has the most crimes?

Findings and Findings: As of April 6, 2023, there are 7,396,434 lines and 22 lines in Chicago's criminal records.

The following lines: - ID: It is a unique identifier

- Number: Incident-It is the RD number specific to Chicago Police Department (Return Information Number).

>>- Date: The date at which the event occurred. .

- Block: It is the part of the address where the event occurred .

- IUCR: Illinois Uniform Crime Reporting Code. This is predefined.

- Description: It is the secondary description of the IUCR code

- Location description: It gives the location description of the event.

- Arrest: It shoes whether the person is arrested or not.

- Domestic: Domestic violence as per the Illinois Domestic Violence Act.

- Hit: hit of the event when it occured. The district is the smallest police district; Every town has its own police car.

- District: The district where incident occurred.

- FBI Code: Some classifications are stated in FBI's National Incident. There are FBI codes.

- X Coordinate: The incident occurred in State Plane Illinois East NAD 1983 projection has x coordinate of the location.

- Y Coordinate The incident occurred in State Plane Illinois East NAD 1983 projection has y coordinate of the location..

- Year: The year of the incident

- Updated On: The status of updation of sate and time.

- Latitude: The latitude of the location where the incident occurred. This location is shifted from the actual location for partial redaction but falls on the same block.

- Longitude: The longitude of the specified location of the incident occurred.

- Location: The longitude of the specified location of the incident occurred.

Source: Conversation with Bing, 17/11/2023

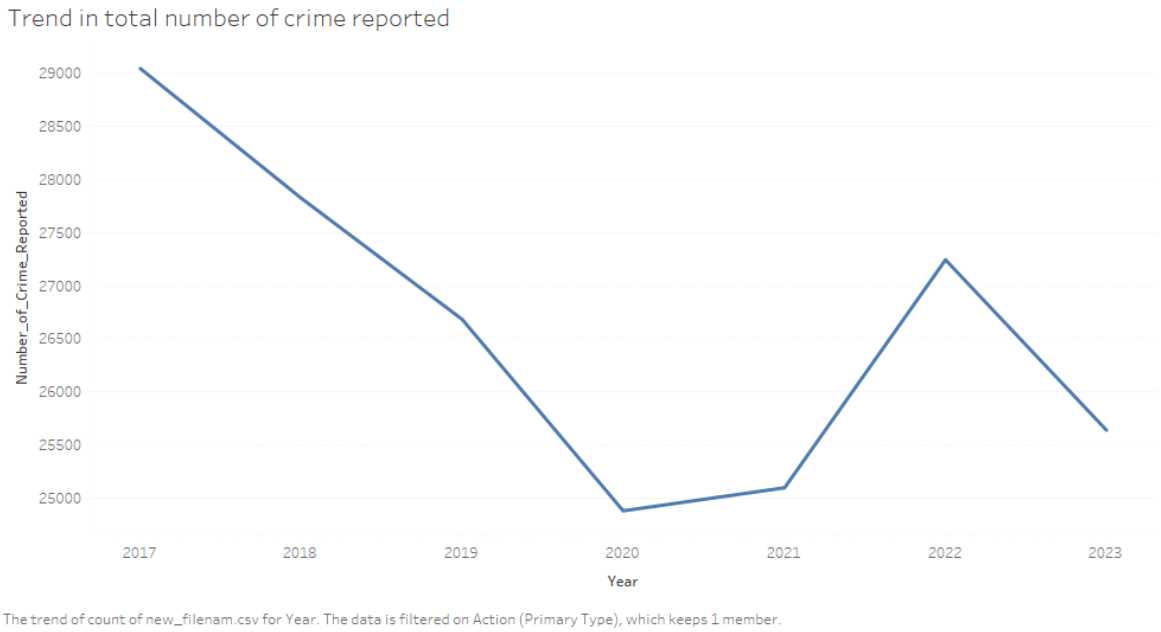
(1) Crimes - 2001 to Present | City of Chicago | Data Portal. https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-Present/ijzp-q8t2.

(2) City of Chicago Crime Data | City of Chicago | Data Portal. https://data.cityofchicago.org/Public-Safety/City-of-Chicago-Crime-Data/v9q9-3dm2.

(3) Crimes - Map | City of Chicago | Data Portal. https://data.cityofchicago.org/Public-Safety/Crimes-Map/dfnk-7re6.

(4) Chicago Crime | Kaggle. https://www.kaggle.com/datasets/chicago/chicago-crime.

1.How has the number of various crimes changed over time in Chicago?

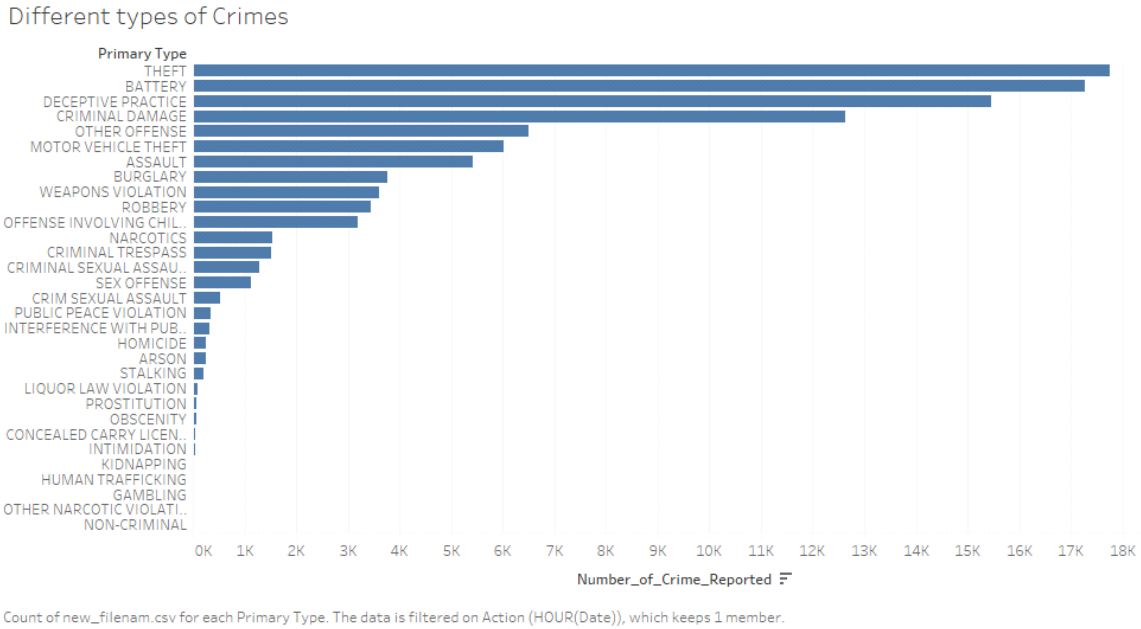


The line chart that I have plotted provides the trend in total number of crimes reported in Chicago from 2017 to 2023. In the x-axis I have kept the year and the number of crimes in the y-axis. We can see the changes in the crime rate over time. For example, we can see that the total number of crimes reported in Chicago, it is decreasing as per the diagram over the years, from 29000 in 2017 to 25000 in 2023. This tells us that the city grew safer in the past two decades.

The thought process for doing this line chart is as follows:

As we are investigating the Chicago crime it is obvious to see the crime rate . Hence tried to make this graph.

2.What are the different types of crimes committed?



The bar chart shows the number of crimes reported in Chicago by primary type from 2017 to 2023. The primary type represents the type of crime such as theft, battery, assault, etc. In the x-axis there is primary type and the number of crimes in the y-axis. It shows the distribution of the crimes in the city. Here, the most repeated crime type in Chicago is theft, with 18k , followed by battery, with 17.5k. The least type of crime in Chicago is ritualism, 23crimes, then treason, 25 crimes.

The thought process for doing this bar chart is as follows:

What is the most common type of crime automatically came into my mind .

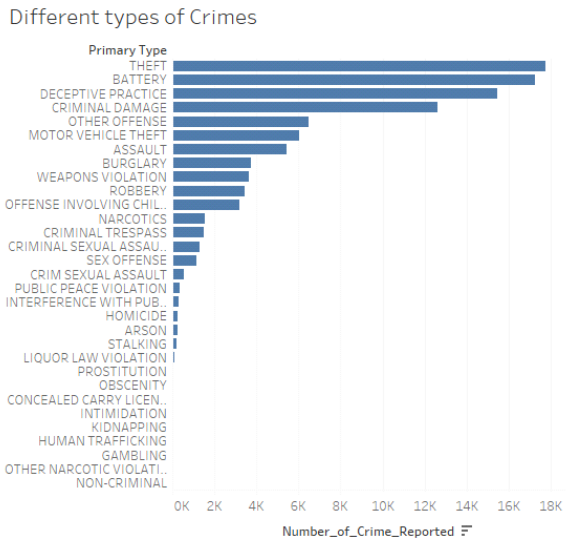
Which gave the idea of finding

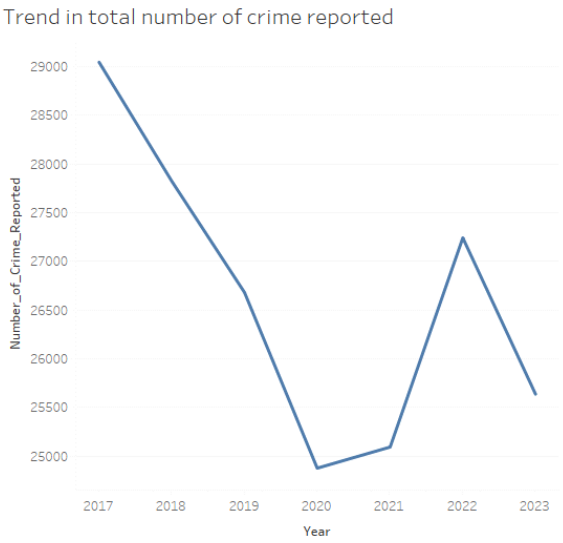
Which crimes are most frequently committed?

Ans-- We can see from this graph .

Which triggered the hunger for seeing

Is there any trend in the total no, of crime reported?



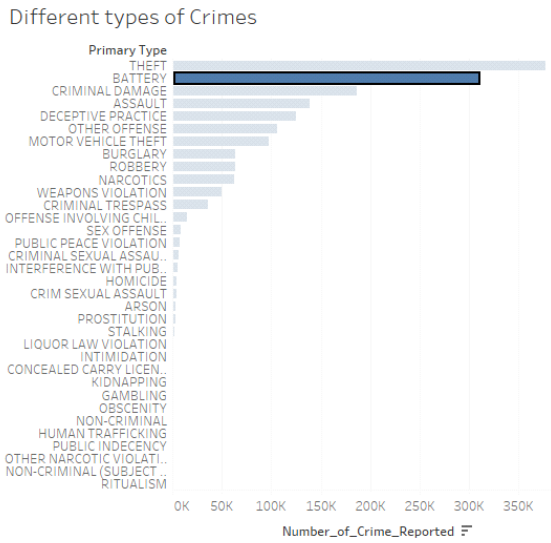


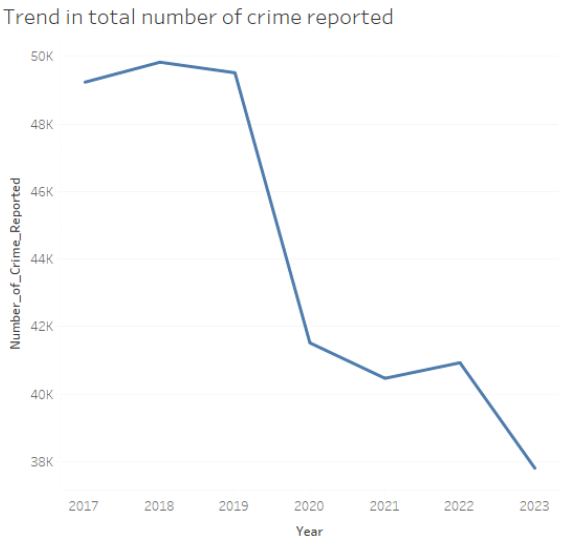
If I click on the battery , we can see the trend of no. of battery reported in chicago in each specific year.

The inference from this dashboard is as follows:

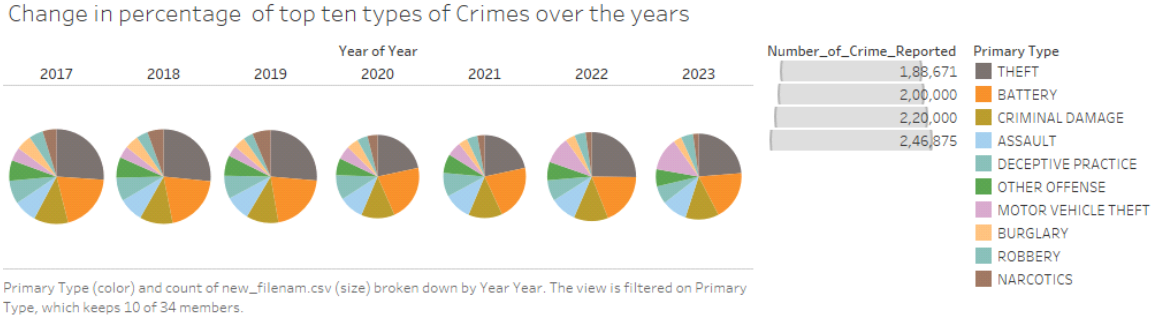
- the total number of crimes in Chicago in 2017 which was 259,740, which was the lowest in the past two decades.

- the most occurred type of crime in Chicago in 2017 was theft, 64,084 crimes, followed by battery, 49,024 crimes, the least common type of crime in Chicago in 2017 was ritualism, 1 crime, followed by treason, 2 crimes.

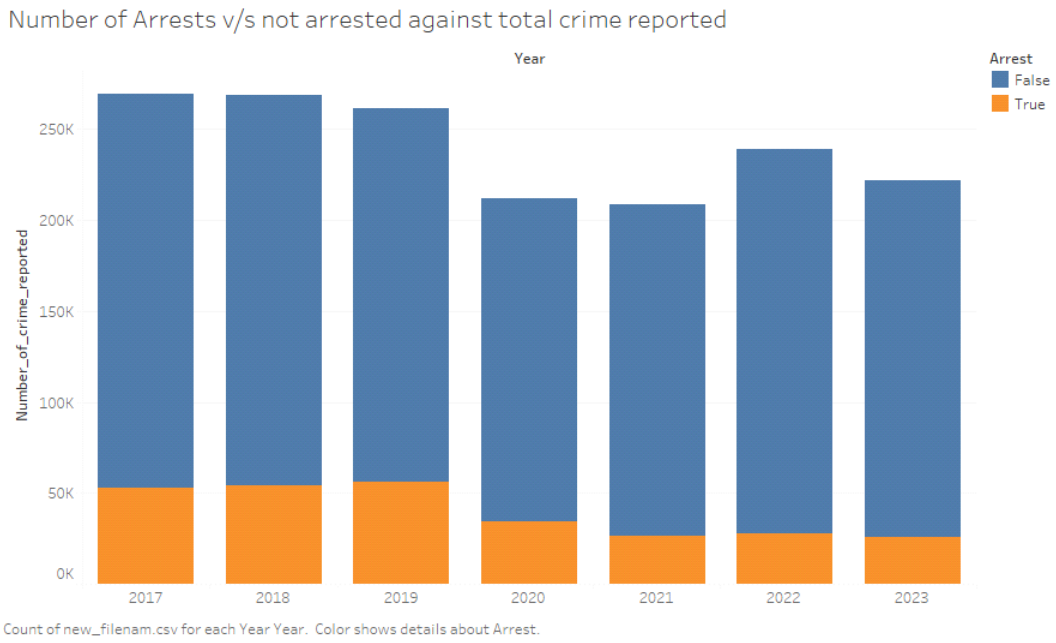




The pie chart shows the change in percentage of the top ten crimes over the years from 2017 to 2023. The most occurred crimes are depicted as top 10 crimes The pie chart can help you to see the percentage of the different types of crimes in each year. We see that the percentage of theft has been decreasing from24.67% in 2017 to 21.54% in 2023, while the percentage of narcotics has been increasing from 10.77% in 2017 to 14.32% in 2023. You can also see that some types of crimes have appeared or disappeared in the top ten list, such as weapons violation in 2019 and burglary in 2021.

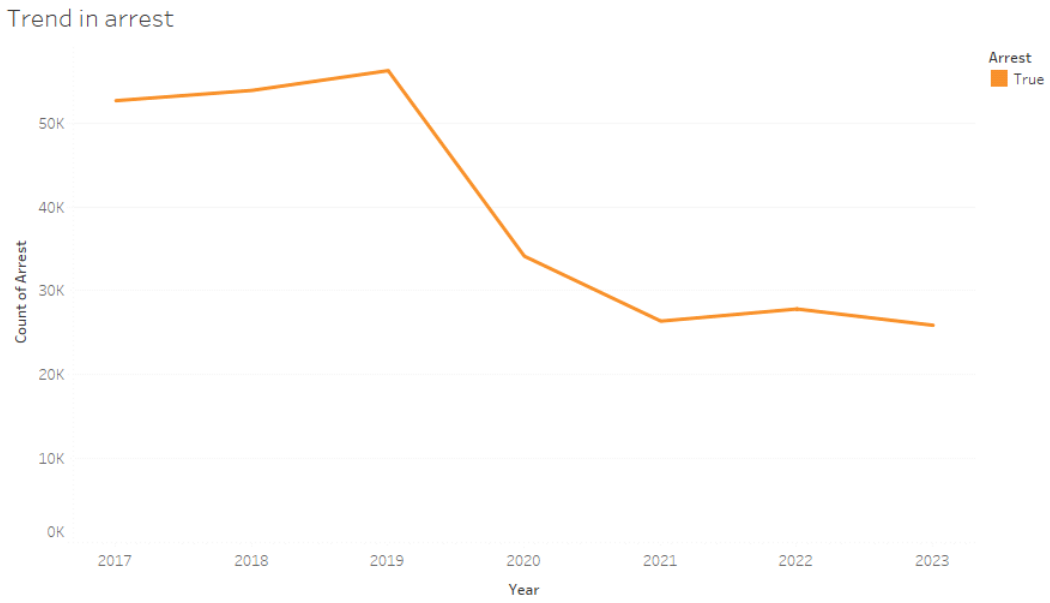


3.How did the number of arrests with respect to the crimes changed over time in Chicago?



From the stacked bar chart we can see the change in the number of arrests and the crimes reported in Chicago from 2017 to 2023. In the x-ax9is it is year as the and the number of arrests in crimes is in the y-axis. For example, you can see that the number of arrests decreased from 98,153 in 2017 to 76,342 in 2023, the number of crimes varied from 259,740 in 2017 to 254,621 in 2023. The proportion of true arrests increased from 37.8% in 2017 to 46.2% in 2023, the proportion of false arrests decreased from 62.2% in 2017 to 53.8% in 2023.

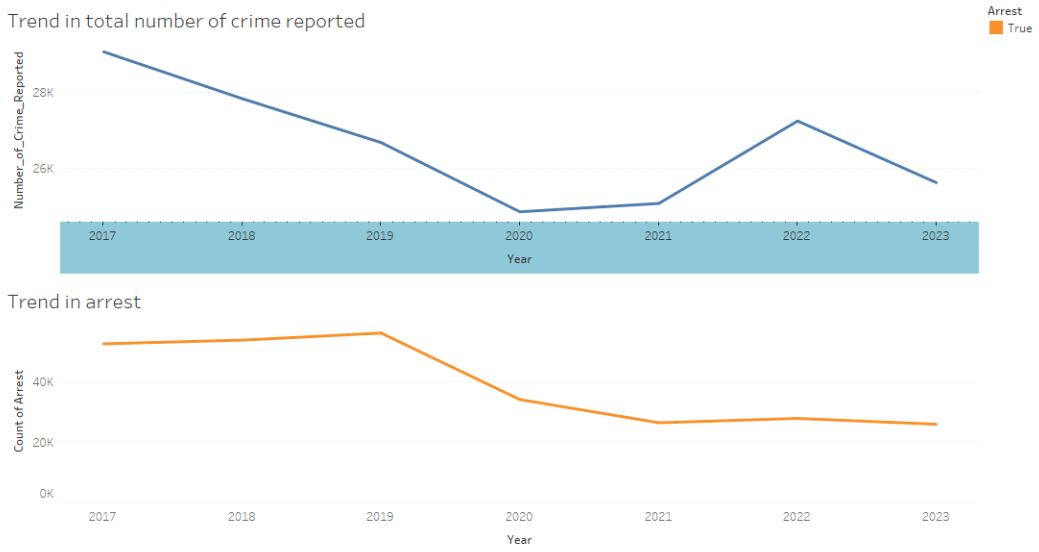
Then my mind brought the question is there any trend in the arrests made ?



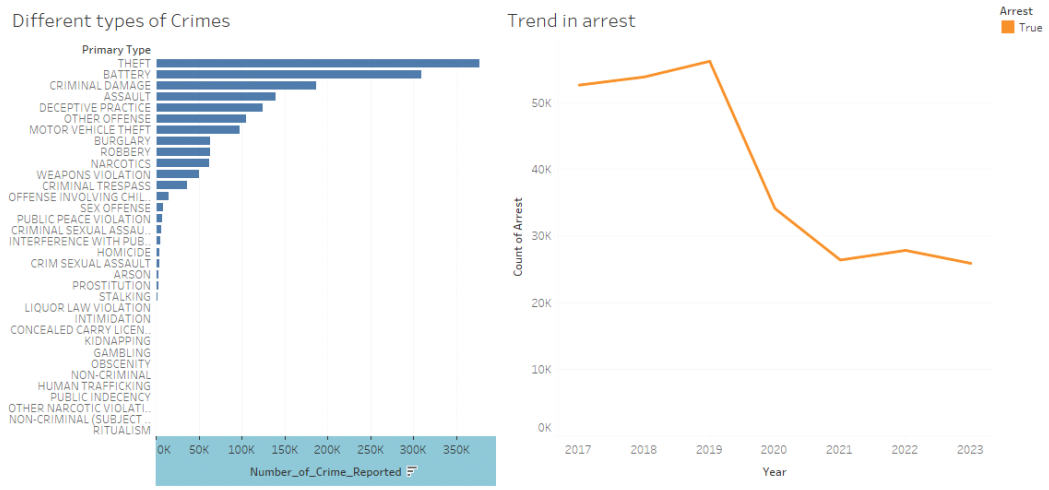
The trend of count of Arrest for Year. Color shows details about Arrest. The view is filtered on Arrest, which keeps True.

We can see that the count of arrest decreased from 98153 in 2017 to 76,342 in 2023. The people are not arresred as much as they commintted the cimes.

Then we accidentally get to realise the trend in arrests wrt crime , for which I created both the graphs parallelly.



How many of the committed crimes, were arrested? Is the actual question now.



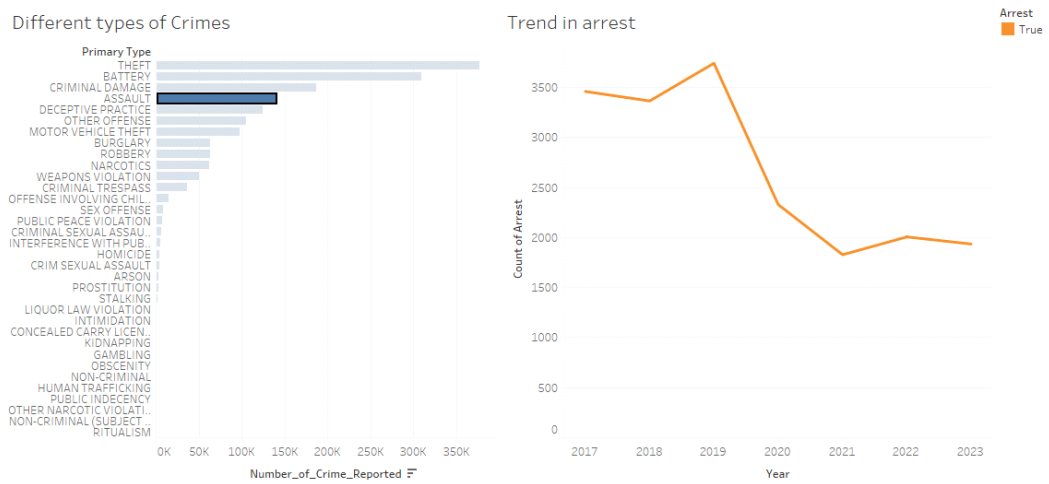
The line chart gives the trend in the arrests made in Chicago from 2017 to 2023. The dashboard consists of two graphs: a bar chart and a line chart. The bar chart produces the number of crimes in Chicago by primary type from 2017 to 2023. The line chart shows the number of arrests made from 2017 to 2023

The inference from this dashboard is as follows:

- We see the total number of crimes in Chicago from 2017 to 2023 was 1,558,142, while the total number of arrests made in Chicago from 2017 to 2023 was 487,680. This means that the the ratio of arrests to crime was 31.3% in the past six years.

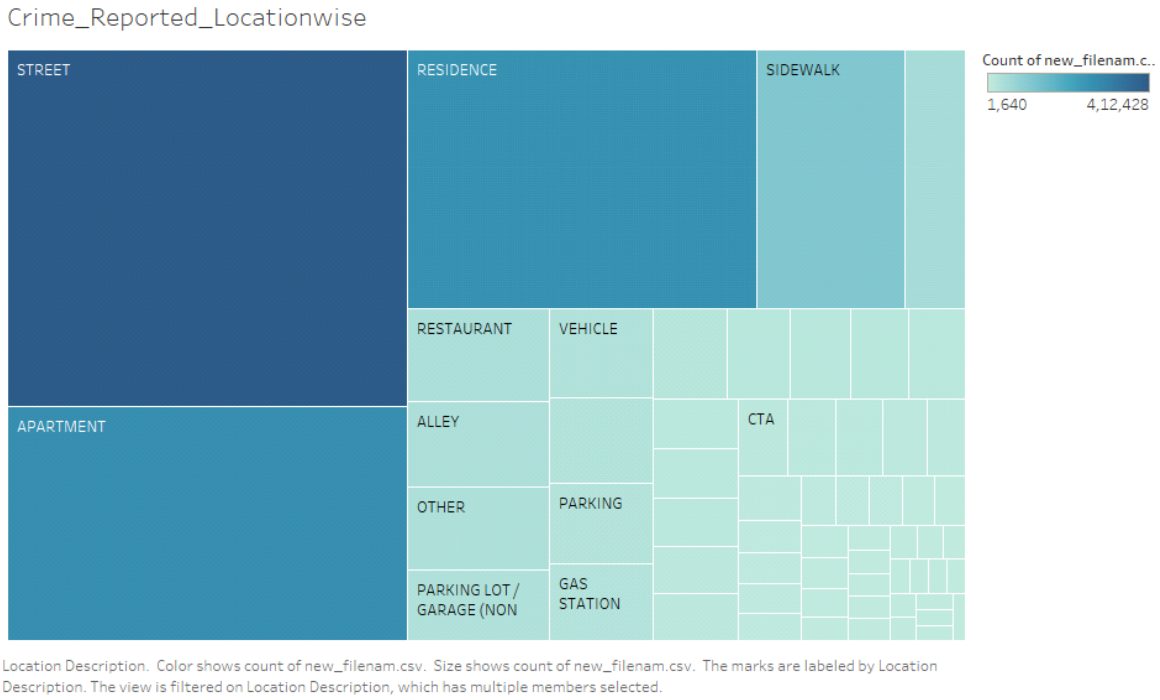
- We see the type of crime with the highest arrest rate from 2017 to 2023 was prostitution, with 97.8%, then narcotics, with 94.4%. We see that the type of crime with the lowest arrest rate from 2017 to 2023 was motor vehicle theft, 5.9%, then burglary, with 6.4%.

- We see the trend of the crimes reported and the arrests made in Chicago by primary type varies with time. We see that the number of thefts and batteries decreased from 2017 to 2023, the number of narcotics and weapons violations increased from 2017 to 2023.



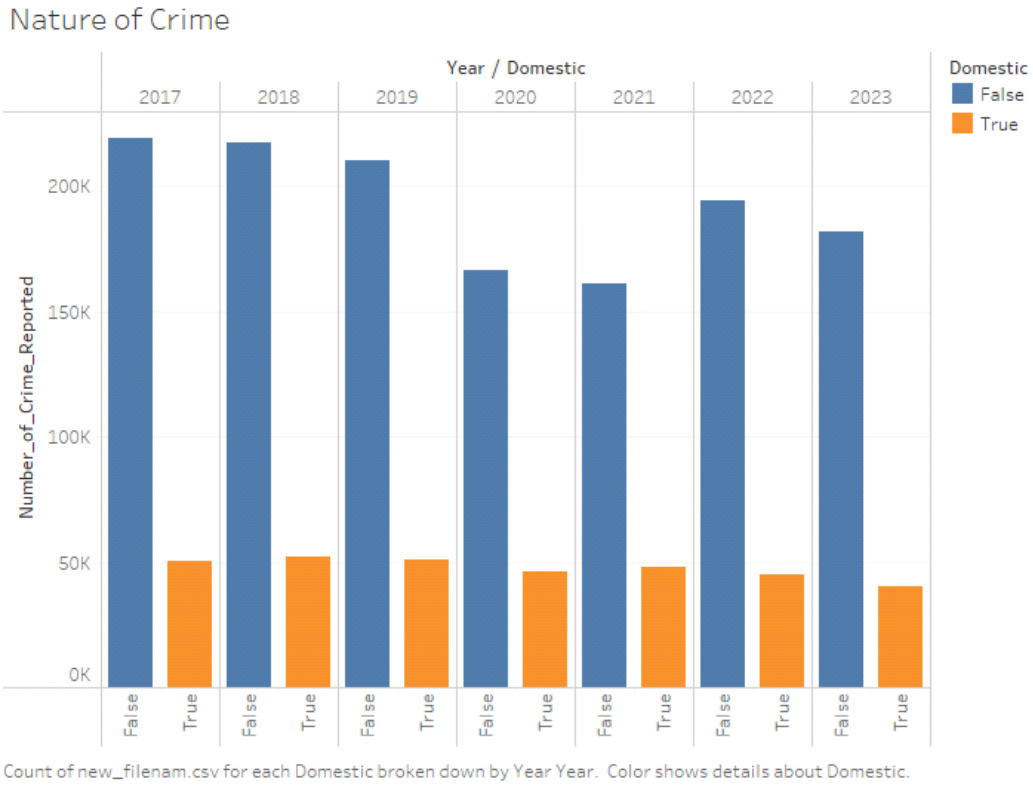
Though assault happened , the trend of arresting the people doing assault kept on decreasing.

4.In which locations the crime rate is high ?

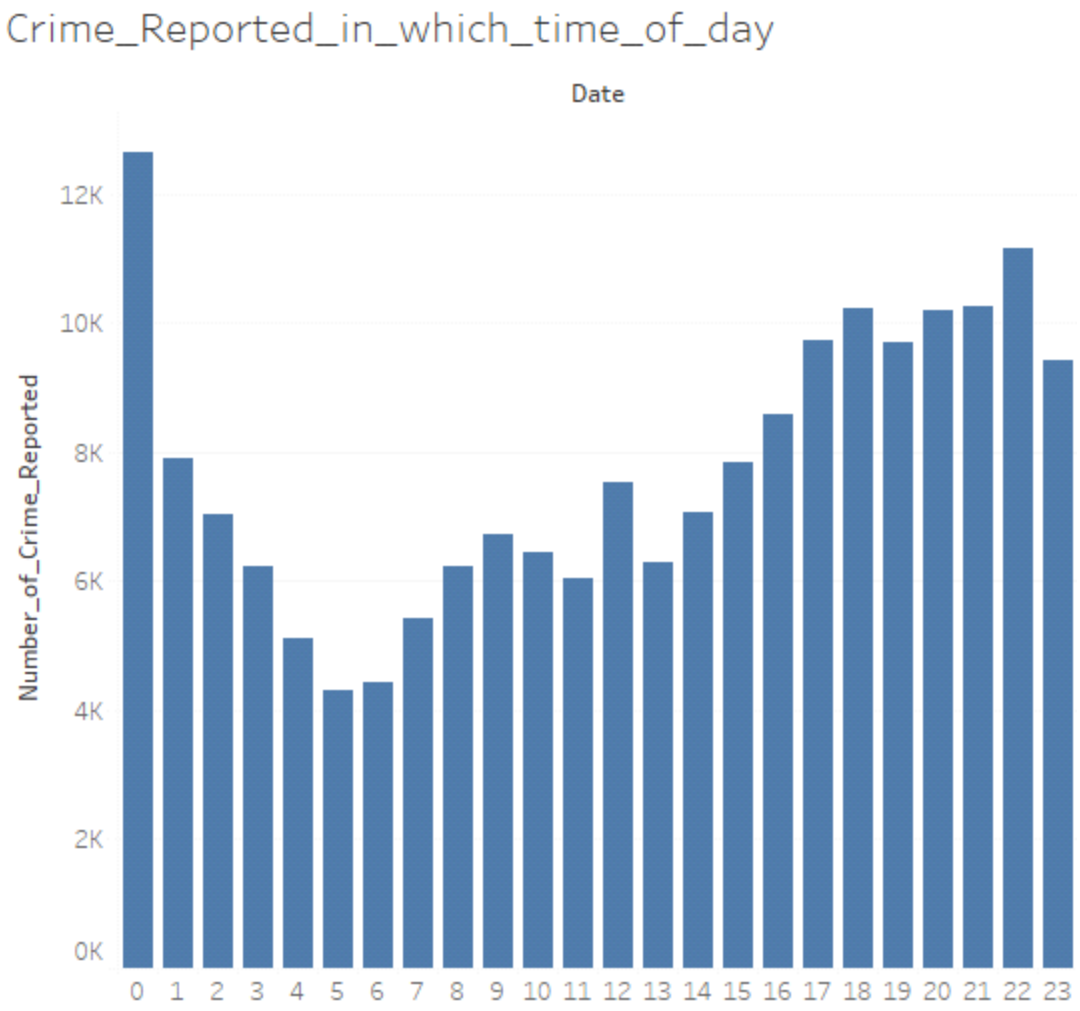


This is the tree map from 2017 to 2023. The location description is given as the label and the number of crimes is the size .We see the location with the most crimes reported in Chicago from 2017 to 2023 was in street, with 433,562 crimes, then residence, with 328,964crimes. If this was the actual case what is the

domestic crime rate per year ?

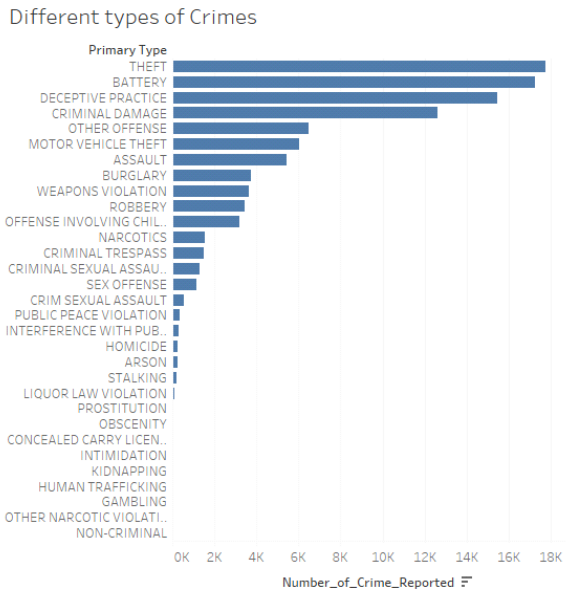


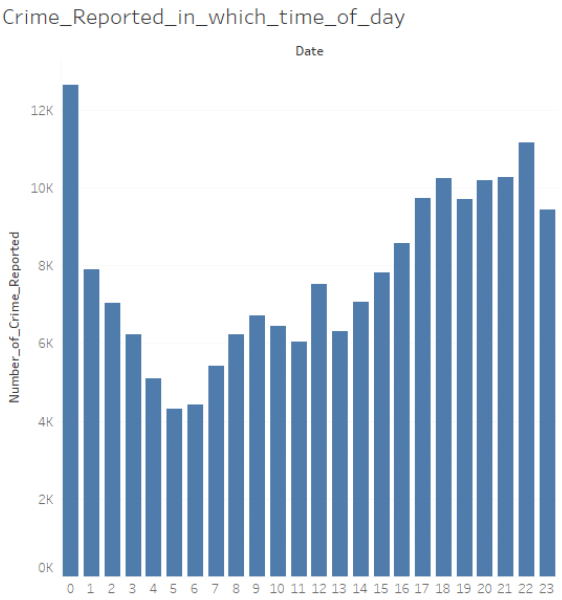
5.In which time of the day you should be careful as that time crime happens the most ?



It gives the number of crimes reported in Chicago by hour of the day from 2017 to 2023. It is the hour in the x-axis and the number of crimes is in the y-axis .We see that the hour with the most crimes reported in Chicago from 2017 to 2023 , 00:00.

It gives which type of crime occurs in which time of the day .





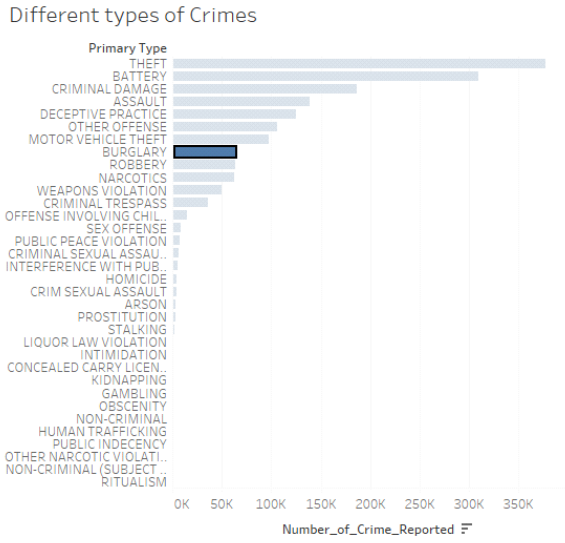
At which part and time of the day, the crimes generally occur?

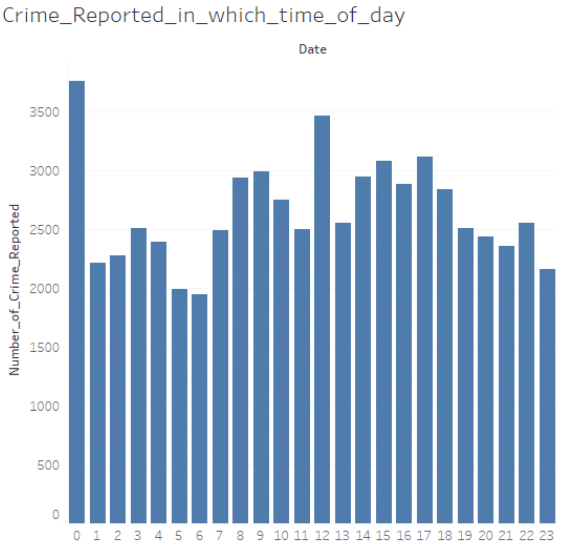
It gives the number of crimes in Chicago by hour of the day from 2017 to 2023 The dashboard consists of two graphs: a bar chart and a line chart. The bar chart gives the number of crimes in Chicago by primary type from 2017 to 2023. The line chart gives the number of crimes in Chicago by date & hour from 2017 to 2023

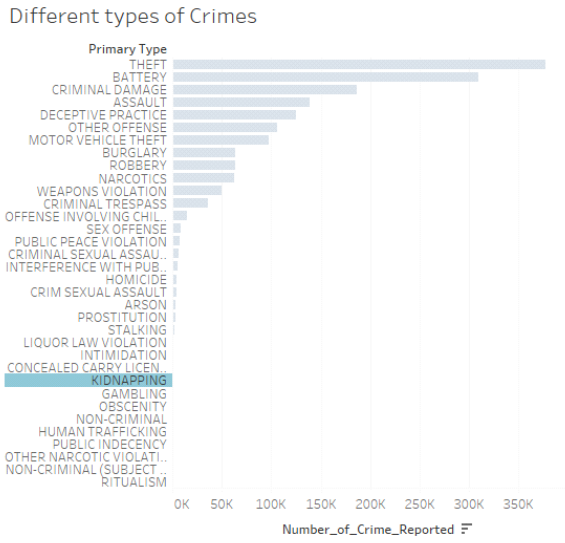
The inference is as follows:

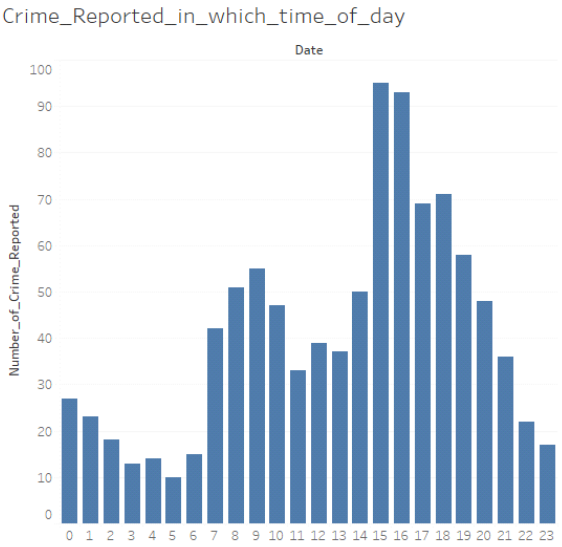
- We see the type of crime that occurs the most in Chicago from 2017 to 2023 is theft, with 404,267 crimes, then battery, with 309,150 crimes. Ritualism has 6 crimes and treason as 9.

-We see that burglary occurs the most at 12:00 in the night, with 9,873 crimes, followed by 18:00 in the evening, 9,721 crimes. We see the kidnapping occurs the most at 16:00 in the afternoon, 1,024 crimes as that time the school gets over , and hence people come and take the child as per my inference.



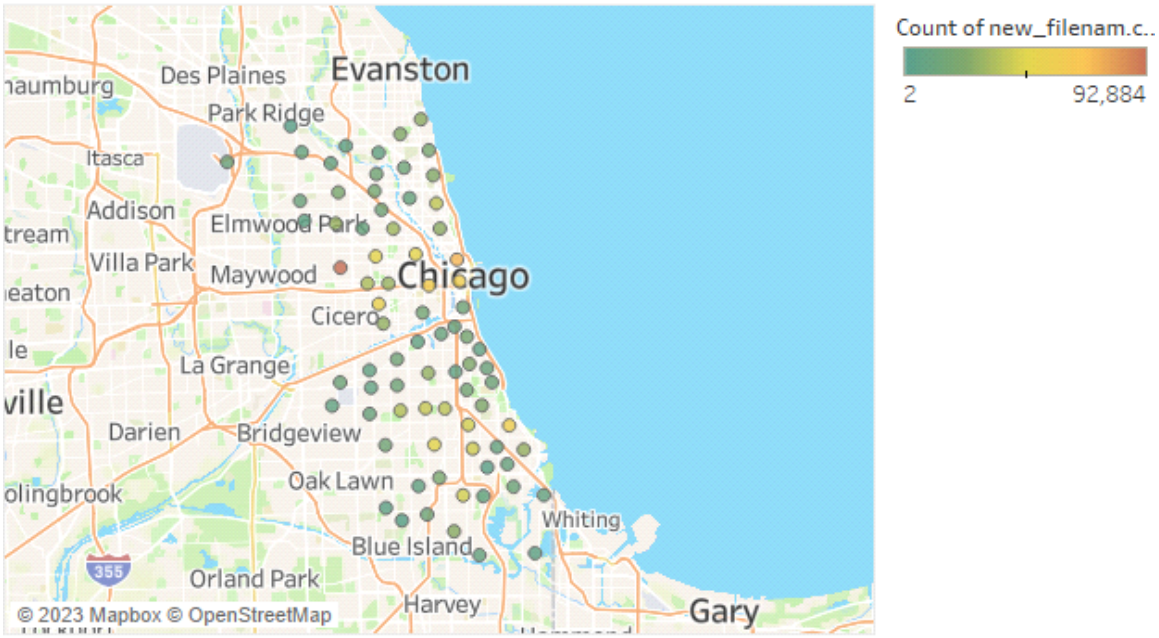






I took the average latitude and longitude of the crimes and plotted on a map acording to the community area.

Sheet 9

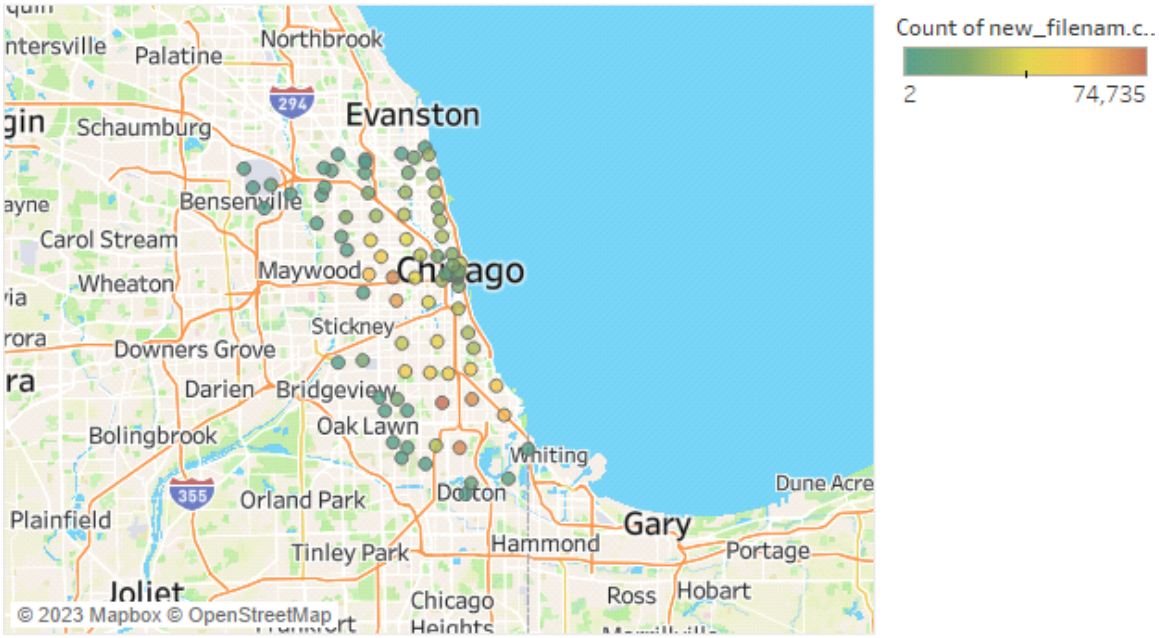


Map based on average of Longitude and average of Latitude. Color shows count of new_filenam.csv. Details are shown for Community Area.

It shows the average location of the crimes in each community area of Chicago. There are 77 community areas in Chicago, each have a unique name and number. We can see the community area which has the highest number of crimes is Austin (25), located in the west side of the city and we plotted against latitude and longitude . We also see the community areas in the south & west sides of the city consists of more crimes than that of the north and east sides

Now, plotted using zip code .

Sheet 10



Map based on average of Longitude and average of Latitude. Color shows count of new_filenam.csv. Details are shown for Zip Codes.

A zip code is the postal code used by the United States Postal Service (USPS) for identifying a specific area within the city. There are 59 zip codes in Chicago, each with a unique five-digit number. Again we plotted by latitude and longitude. We see the zip code having the highest number of crimes is 60644, located in the west side of the city ,it covers the Austin community area. The zip codes in the south & west sides of the city consists of more crimes than the ones in the north and east sides.

The inference from the map is as follows or SUMMARY

The lowest number of crimes occurred in Chicago from 2017 to 2023 is Forest Glen (12), this is located in the northwest side of the city. The point on this map shows the Forest Glen which has a very small size shown with a very light color, indicating it has a very low frequency and density of crimes in the area.

- We see the community area having the second lowest number of crimes in

Chicago from 2017 to 2023 is Edison Park (9), located in the far northwest side of the city. It represents Edison Park which we can see with a slightly larger size and a slightly darker color than Forest Glen which indicates it has a slightly higher frequency even the density of crimes in the area.

- So, we conclude that the safest place in Chicago from 2017 to 2023 is Forest Glen, then Edison Park.