

Department of Cyber Security

Batch: 23-Fall

CRIME VIEW 360

Exploratory Data Analysis of Crimes

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Our team



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INTRODUCTION

WHAT IS CRIMEVIEW 360??

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WHAT IS CRIMEVIEW 360??

- Crime View 360 is a data analysis project to organize and analyze large amounts of crime related data in Chicago in the year 2016.
- The city of Chicago being the third largest city in the world is the hub of dangerous crimes as diverse population comes with great cost i.e CRIMES.
- Crimes such as theft, robbery, assault, battery, narcotics, burglary, weapons violation and criminal damage pose a significant threat to the safety and well-being of its citizens.
- The goal is to help users identify patterns and create crime reduction strategies and make better decisions.



02

TECHNICAL

OVERVIEW

FORMATION OF CRIME VIEW 360:



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KAGGLE

- Provided sample dataset of Crimes in Chicago



VISUAL PARADIGM

- Provided the visualization of dataset through ERD



MYSQL

- Provided a GUI and CLI for query processing



PYTHON

- Provided the dashboard for interactive visualization through graphs

<https://www.kaggle.com/code/umeshnarayanappa/exploring-chicago-crimes-2012-2016>

M

3 DATA ANALYSIS

Interacting with the dataset



WHERE DOES THE CRIMES OCCUR?



Chicago

The city of incidents



Districts

Different districts in Chicago are the prey of horrendous crimes



2520

INCIDENTS





SCHEMA

RECORDS

2520 records in incident table

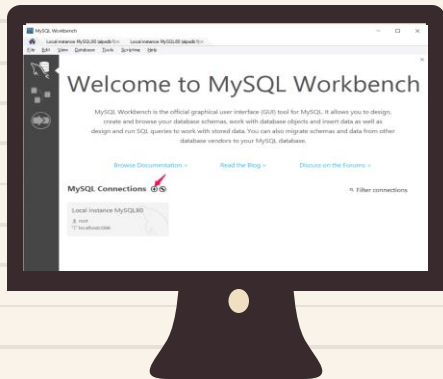
ATTRIBUTES

- 14 fields in the incident table
- 10 in the location table
- 3 in the crime table

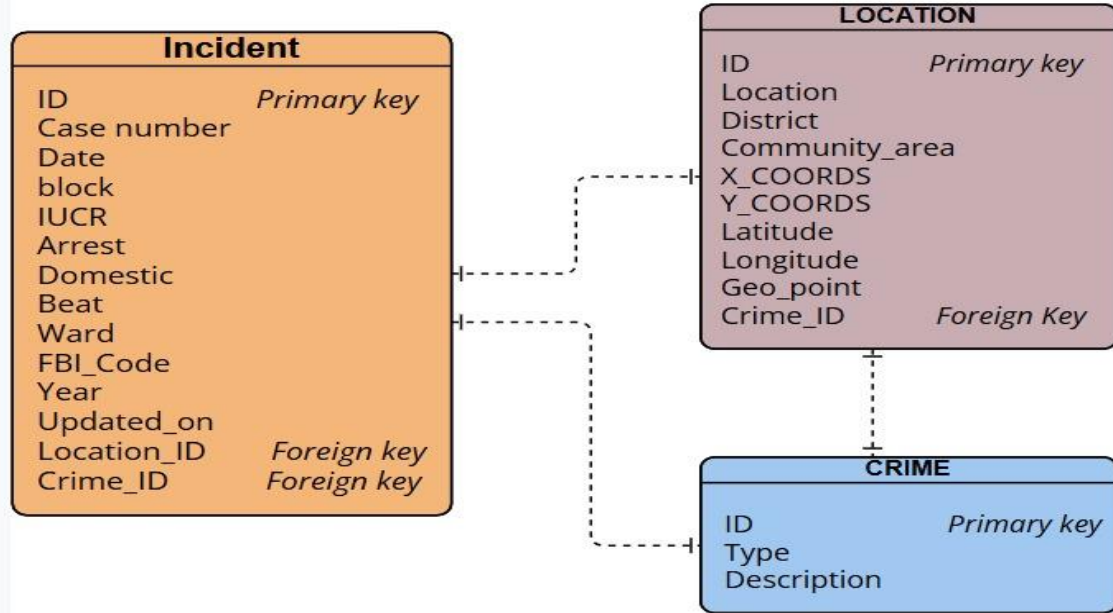
TABLES

There are 3 tables

- INCIDENT
- LOCATION
- CRIME



ERD VIEW



DATASET (INCIDENT)

ID	Case number	Date	block	iucr	Arrest	Domestic	Beat	ward	FBI_Code	Year	Updated_on	location_ID	crime_ID
1	HZ250496	5/3/2016 23:40	013XX S SAWYER AVE	486	TRUE	TRUE	1022	24	088	2016	5/10/2016 15:56	1	1
2	HZ250329	5/3/2016 9:00	048XX W EDDY ST	486	FALSE	TRUE	1634	38	088	2016	5/10/2016 15:56	2	2
3	HZ250409	5/3/2016 21:40	061XX S DREXEL AVE	486	FALSE	TRUE	313	20	088	2016	5/10/2016 15:56	3	3
4	HZ251423	5/3/2016 22:22	087XX S BURLEY AVE	1320	FALSE	FALSE	424	7	14	2016	5/10/2016 15:56	4	4
5	HZ250503	5/3/2016 23:31	053XX W CHICAGO AVE	470	FALSE	FALSE	1524	37	24	2016	5/10/2016 15:56	5	5
6	HZ252306	5/3/2016 12:25	0000X W MONROE ST	890	FALSE	FALSE	112	42	6	2016	5/11/2016 15:48	6	6
7	HZ250965	5/4/2016 11:44	082XX S LOOMIS BLVD	4625	TRUE	FALSE	614	21	26	2016	5/11/2016 15:50	7	7
8	HZ250979	5/4/2016 11:40	052XX S FAIRFIELD AVE	1310	FALSE	FALSE	923	14	14	2016	5/11/2016 15:50	8	8
9	HZ251242	5/3/2016 12:15	013XX E 72ND ST	460	FALSE	FALSE	324	5	088	2016	5/10/2016 15:56	9	9
10	HZ241180	4/26/2016 16:55	019XX S JEFFERSON ST	486	TRUE	TRUE	1235	25	088	2016	5/11/2016 15:48	10	10
11	HZ250940	5/4/2016 11:20	054XX S STATE ST	1811	TRUE	FALSE	225	3	18	2016	5/11/2016 15:50	11	11
12	HZ250424	5/3/2016 22:10	049XX W FULTON ST	460	FALSE	FALSE	1532	28	088	2016	5/10/2016 15:56	12	12
13	HZ251653	5/3/2016 17:00	063XX N HERMITAGE AVE	820	FALSE	FALSE	2433	40	6	2016	5/10/2016 15:56	13	13
14	HZ251276	5/3/2016 20:00	062XX N NEWCASTLE AVE	810	FALSE	FALSE	1611	41	6	2016	5/10/2016 15:56	14	14

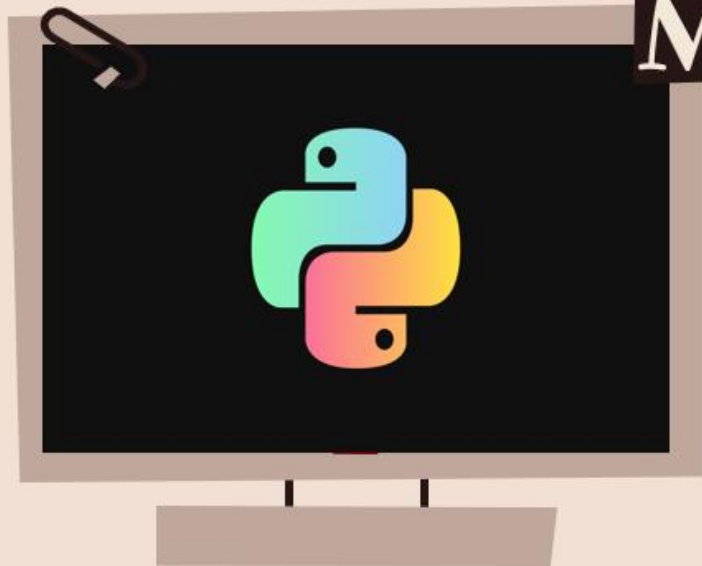
DATASET (LOCATION)

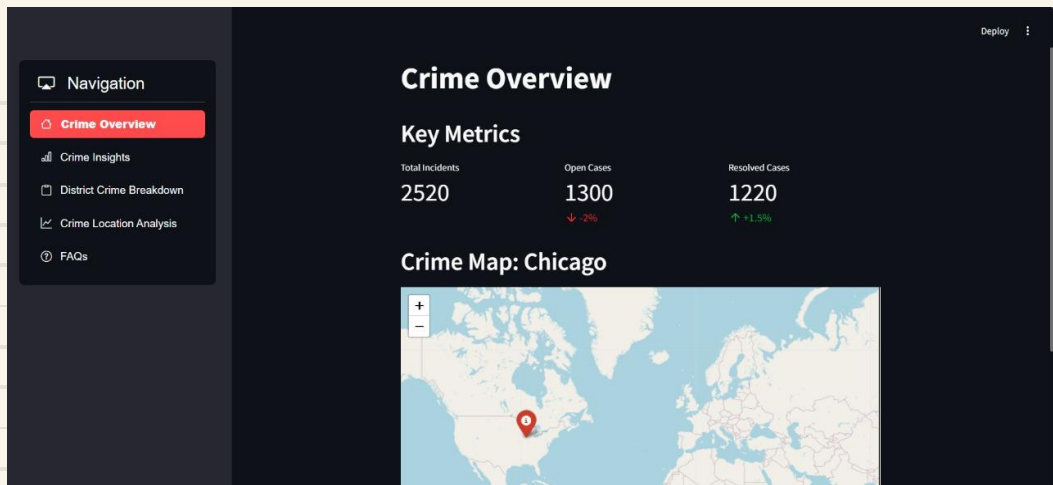
ID	location	district	community_area	X_COORDS	Y_COORDS	latitude	longitude	geo_point	crime_ID
1	APARTMENT	10	29	1154907	1893681	41.86407316	-87.70681861	(41.864073157, -87.706818608)	1
2	RESIDENCE	3	42	1183066	1864330	41.78292153	-87.60436317	(41.782921527, -87.60436317)	2
3	VEHICLE NON-COMMERCIAL	4	46	1199184	1847735	41.73699363	-87.54582776	(41.736993626, -87.545827764)	3
4	STREET	15	25	1140789	1904819	41.89490828	-87.75837196	(41.894908283, -87.758371958)	4
5	APARTMENT	12	31	1172638	1890906	41.85608483	-87.64181110	(41.856084827, -87.6418111)	5
6	SIDEWALK	15	25	1143223	1901475	41.88568685	-87.74951598	(41.885686845, -87.749515983)	6
7	RESIDENCE	24	77	1163624	1941880	41.99615508	-87.67345707	(41.996155077, -87.673457065)	7
8	SIDEWALK	3	69	1182827	1856621	41.76177285	-87.60547861	(41.761772852, -87.605478606)	8
9	RESIDENCE	15	25	1139890	1901675	41.88629724	-87.76175071	(41.886297242, -87.761750709)	9
10	RESTAURANT	22	73	1168076	1841733	41.72124785	-87.65996945	(41.721247847, -87.659969446)	10
11	CHA HALLWAY/STAIRWELL...	1	35	1176730	1886544	41.84402377	-87.62692325	(41.844023772, -87.626923253)	11
12	RESIDENCE	3	42	1183781	1861450	41.77500188	-87.60183161	(41.775001884, -87.601831608)	12
13	APARTMENT	17	13	1153730	1936013	41.98025918	-87.71000978	(41.980259177, -87.710009782)	13
14	STREET	9	61	1172757	1877882	41.82034323	-87.64175921	(41.820343226, -87.641759214)	14
15	HOTEL/MOTEL	18	8	1175666	1903593	41.89083129	-87.63031551	(41.890831286, -87.63031551)	15

DATASET (CRIME)

ID	type	description
1	BATTERY	DOMESTIC BATTERY SIMPLE
2	BATTERY	DOMESTIC BATTERY SIMPLE
3	CRIMINAL DAMAGE	TO VEHICLE
4	PUBLIC PEACE VIOLATION	RECKLESS CONDUCT
5	BATTERY	DOMESTIC BATTERY SIMPLE
6	BATTERY	SIMPLE
7	THEFT	\$500 AND UNDER
8	BATTERY	DOMESTIC BATTERY SIMPLE
9	THEFT	\$500 AND UNDER
10	CRIMINAL DAMAGE	TO PROPERTY
11	BATTERY	SIMPLE
12	BATTERY	DOMESTIC BATTERY SIMPLE
13	DECEPTIVE PRACTICE	FINANCIAL IDENTITY THEF...
14	THEFT	\$500 AND UNDER
15	THEFT	FROM BUILDING

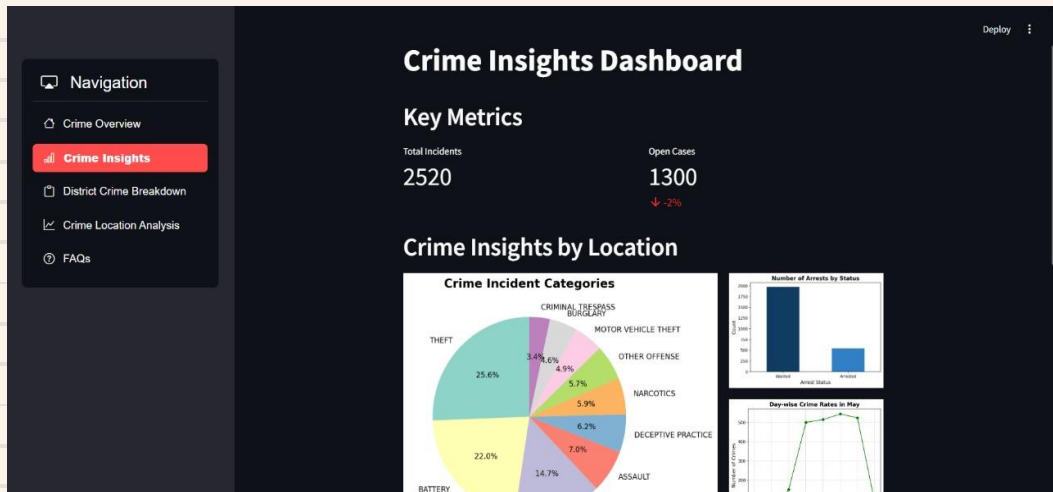
4 **QUERIES AND VISUALIZATION**





DASHBOARD VIEW

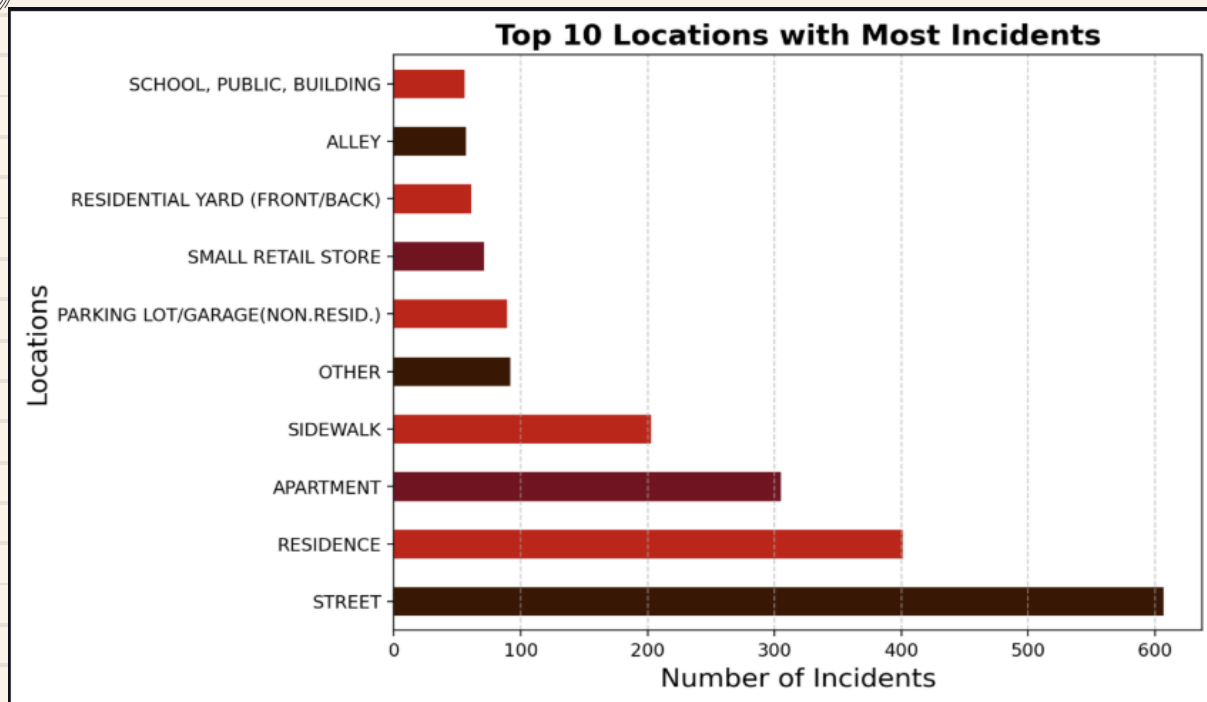
- This dashboard is visualized using Python.
- The background color of this dashboard is black.
- The background of the graphs is white.



- There is line graph, pie chart and bar graph.
- Total incidents are 2520
- Open cases are 1300

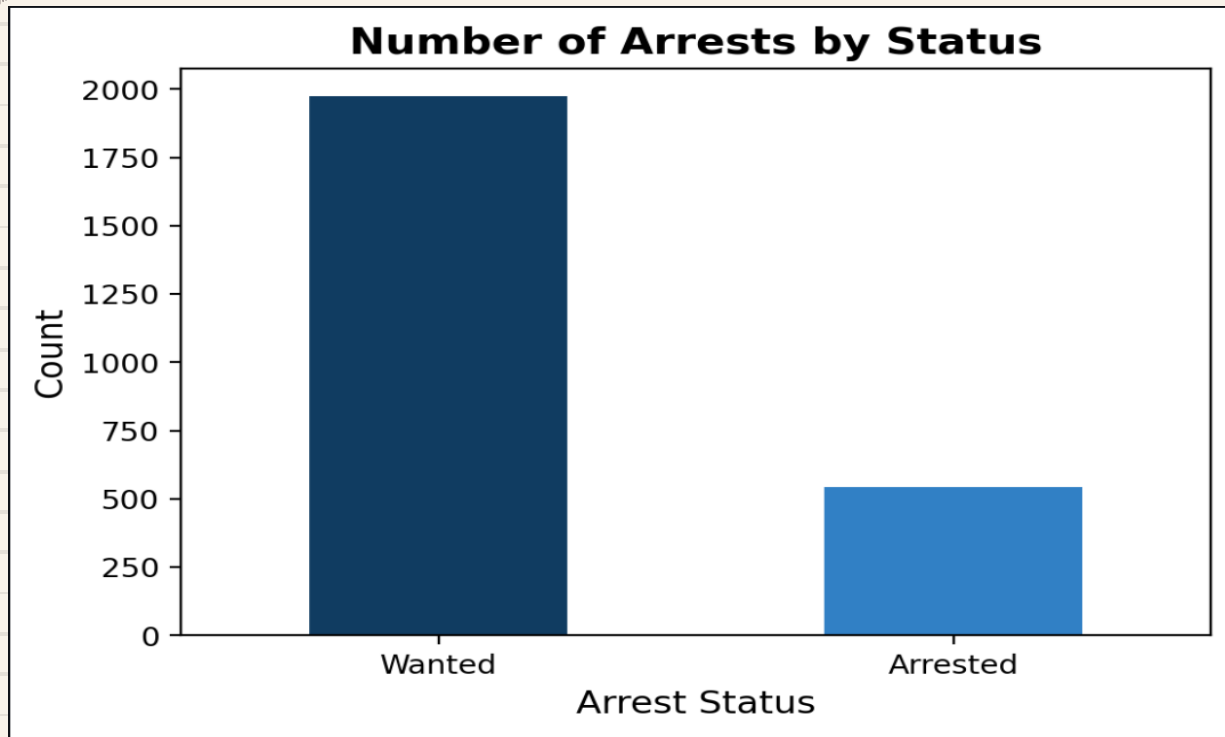


TOP 10 CRIME LOCATIONS



- **STREET : 607**
- **RESIDENCE : 401**
- **APARTMENT: 305**
- **SIDEWALK : 203**
- **OTHER : 92**
- **PARKING LOT/GARAGE: 89**
- **SMALL RETAIL STORE : 71**
- **RESIDENTIAL YARD: 61**
- **ALLEY: 57**
- **SCHOOL, PUBLIC, BUILDING: 56**

ARREST AND WANTED STATUS



545

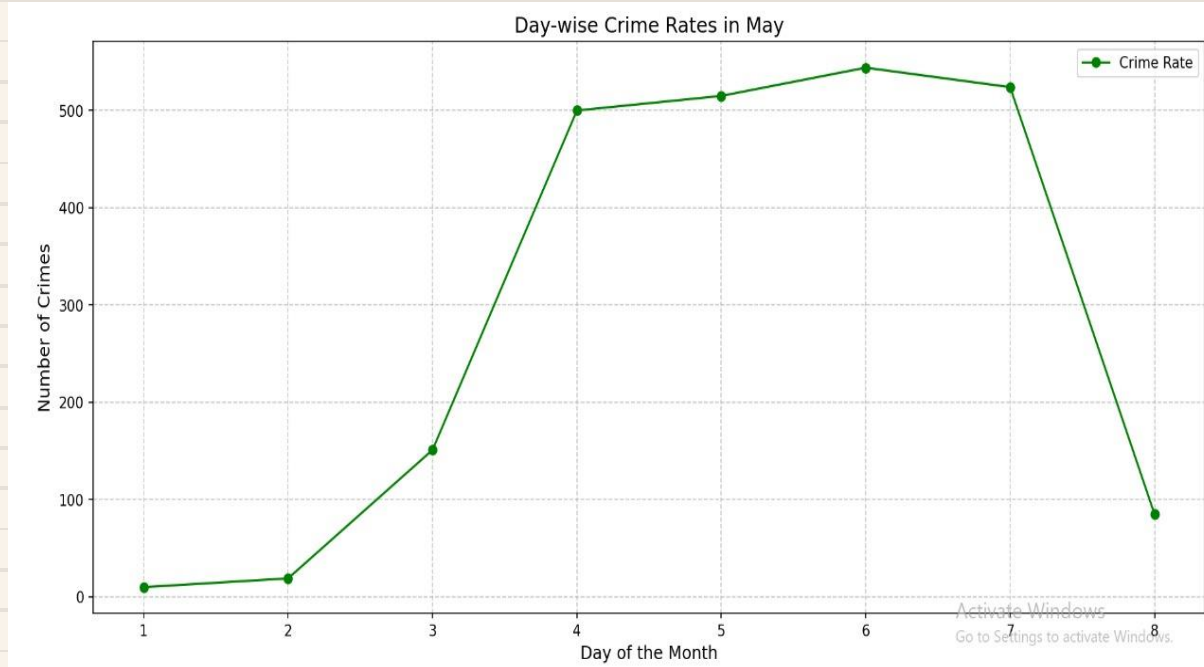
Criminals that are
arrested

1,975

Criminals that are
wanted



DAY WISE CRIME RATES IN MAY 2016

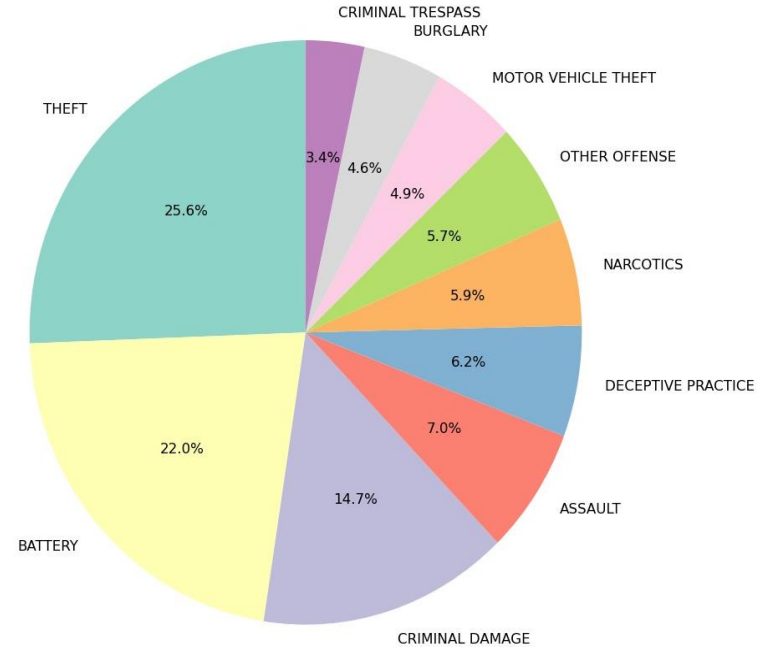


- **DAY 1:** 10
- **DAY 2:** 19
- **DAY 3:** 151
- **DAY 4:** 500
- **DAY 5:** 515
- **DAY 6:** 544
- **DAY 7:** 524
- **DAY 8:** 85

TOP 10 MOST FREQUENT INCIDENT CATEGORIES

- Theft 25.6%
- Battery 22%
- Narcotics 5.9%
- Assault 7%
- Burglary 4.6%
- Criminal Trespass 3.4%
- Motor Vehicle Theft 4.9%
- Deceptive Practice 6.2%
- Criminal Damage 14.7%
- Other Offense 5.7%

Top 10 Most Frequent Incident Categories



QUERIES



What are the top crimes in each district?

```
WITH CrimeCounts AS (  
    SELECT  
        l.District,  
        c.Type,  
        COUNT(*) AS TotalIncidents  
    FROM Incident AS i  
    JOIN Location AS l ON i.Location_ID = l.ID  
    JOIN Crime AS c ON i.Crime_ID = c.ID  
    GROUP BY  
        l.District,  
        c.Type  
)  
MostCommonCrimes AS (  
    SELECT  
        District,  
        Type,  
        TotalIncidents,  
        RANK() OVER (PARTITION BY District ORDER BY  
TotalIncidents DESC) AS Ranks  
    FROM CrimeCounts  
)  
SELECT  
    District,  
    Type AS MostCommonCrime,  
    TotalIncidents  
FROM MostCommonCrimes  
WHERE Ranks = 1  
ORDER BY District;
```

	District	MostCommonCrime	TotalIncidents
0	1	THEFT	71
1	10	BATTERY	38
2	11	BATTERY	40
3	12	THEFT	42
4	14	THEFT	45
5	15	BATTERY	30
6	16	THEFT	26
7	17	THEFT	22
8	18	THEFT	74
9	19	THEFT	41
10	2	BATTERY	20

QUERIES



What are the total incidents according to each hour?

```
SELECT
    HOUR(STR_TO_DATE(i.Date, '%m/%d/%Y %H:%i'))
    AS HourOfDay,
    COUNT(*) AS TotalIncidents
FROM Incident AS i
WHERE i.Date IS NOT NULL
GROUP BY HourOfDay
ORDER BY HourOfDay;
```

	HourOfDay	TotalIncidents
0	0	160
1	1	100
2	2	74
3	3	53
4	4	47
5	5	43
6	6	34
7	7	61
8	8	75
9	9	116
10	10	105
11	11	126
12	12	90
13	13	116
14	14	116
15	15	111
16	16	164

QUERIES



What is the distribution of incidents in different weeks for each crime type?

```
SELECT
MONTHNAME(STR_TO_DATE(i.Date, '%m/%d/%Y %H:%i')) AS
MonthName,

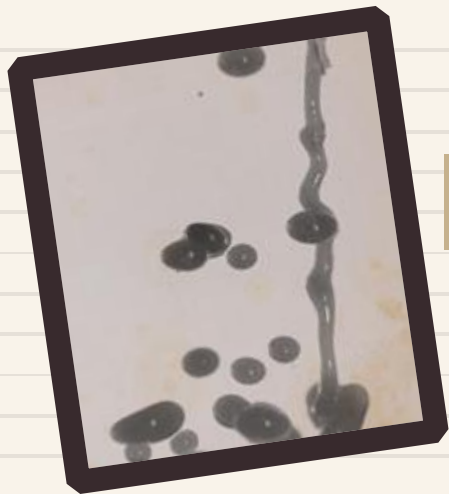
WEEK(STR_TO_DATE(i.Date, '%m/%d/%Y %H:%i')) -
WEEK(DATE_SUB(STR_TO_DATE(i.Date, '%m/%d/%Y %H:%i'),

INTERVAL DAYOFMONTH(STR_TO_DATE(i.Date, '%m/%d/%Y
%H:%i')) - 1 DAY)) + 1 AS WeekOfMonth,

c.Type,
COUNT(*) AS TotalIncidents

FROM Incident AS i
JOIN Crime AS c ON i.Crime_ID = c.ID
WHERE i.Date IS NOT NULL
GROUP BY MonthName, WeekOfMonth, c.Type
ORDER BY MonthName, WeekOfMonth, c.Type;
```

	MonthName	WeekOfMonth	Type	TotalIncidents
0	April	1	BATTERY	1
1	April	2	ASSAULT	2
2	April	2	BATTERY	14
3	April	2	BURGLARY	4
4	April	2	CRIMINAL DAMAGE	5
5	April	2	INTERFERENCE WITH PUBLIC OFFICER	3
6	April	2	LIQUOR LAW VIOLATION	1
7	April	2	MOTOR VEHICLE THEFT	1
8	April	2	OFFENSE INVOLVING CHILDREN	1
9	April	2	OTHER OFFENSE	1
10	April	2	PROSTITUTION	1
11	April	2	ROBBERY	3
12	April	2	THEFT	6
13	April	3	ASSAULT	1
14	April	3	BATTERY	2
15	April	3	CRIMINAL DAMAGE	2



05

AIMS AND

OBJECTIVES

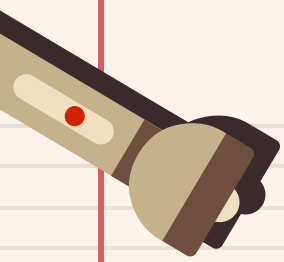




AIMS AND OBJECTIVES



- To develop a comprehensive system that effectively organizes and visualizes crime data for better understanding.
- To leverage data analysis techniques to identify crime patterns and trends in Chicago.
- To contribute to public safety by enabling the development of informed and actionable crime reduction strategies.
- To utilize advanced visualization tools for presenting crime trends in a clear and impactful manner.
- To uncover correlations and relationships between different crime types, locations, and timeframes.
- To provide a resource for policymakers, law enforcement, and researchers to make data-driven decisions..



STRATEGIES FOR CRIME REDUCTION



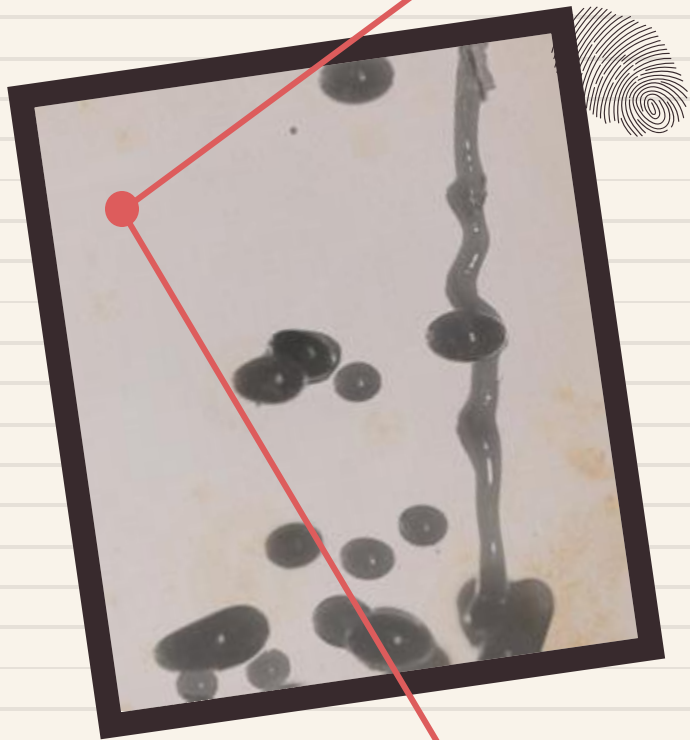
- Focus police patrols in high-crime areas.
- Install CCTV and improve street lighting where crimes are high.
- Promote neighborhood watch programs/ hire security guards for risky locations.
- Enhance street lighting and manage abandoned spaces.
- Provide district-specific data to policymakers.
- Organize workshops to educate the public on crime prevention tactics and personal safety.
- Enable access to interactive dashboards and crime alerts.
- Highlighting specific risks to help individuals take better precautions for their safety.



06

CONCLUSION

Final Thoughts



FINAL THOUGHTS

Crime View 360 stands as an innovative solution to tackle the challenges posed by analyzing large-scale crime data. By organizing and visualizing crime trends in Chicago, this project enables the identification of patterns and correlations critical for formulating effective crime reduction strategies.

Our data-driven approach ensures informed decision-making, aiming to enhance public safety and well-being. With its potential to provide meaningful insights, **Crime View 360** represents a step forward in utilizing technology for societal benefit, reinforcing our commitment to making a difference through impactful data analysis.





*THANK
YOU*

The End of CRIME VIEW 360



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