

Crimes in Vancouver

Mini Project 1

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Business Context

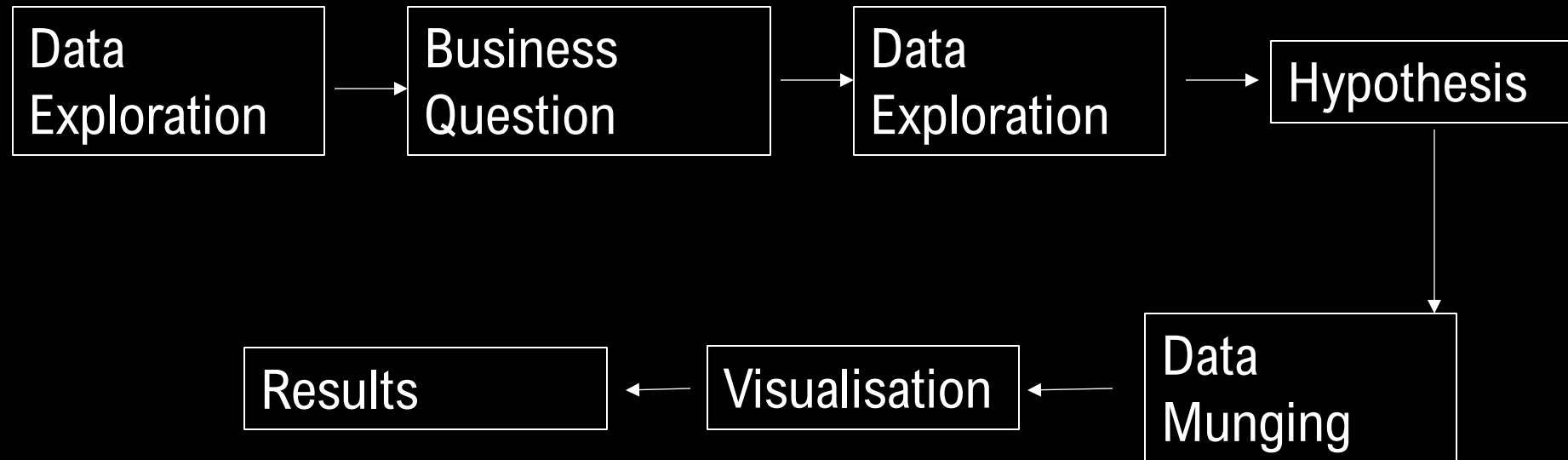
Vancouver City has a population of 631,486 (2016 census) with an average of 36,708 crimes per year*. The VC Police department is made up of 1716 employees (May, 2015)

With limited resources following the pandemic, police departments globally need to be allocating staff accordingly and to the right areas to maximise efficiency.

Business Question

- Do more crimes occur during day time (7am-7pm) or night time (7pm-7am)?

Data Pipeline



Data Summary

- Downloaded from Kaggle.com as a .csv
- 'crime_records.csv'

```
data.head(3)
```

		TYPE	YEAR	MONTH	DAY	HOUR	MINUTE	HUNDRED_BLOCK	NEIGHBOURHOOD	X	Y
0	Break and Enter Commercial		2012	12	14	8	52	NaN	Oakridge	491285.000000	5.453433e+06
1	Break and Enter Commercial		2019	3	7	2	6	10XX SITKA SQ	Fairview	490612.964805	5.457110e+06
2	Break and Enter Commercial		2019	8	27	4	12	10XX ALBERNI ST	West End	491007.779775	5.459174e+06

- Data was mostly clean – missing values in:
 - HUNDRED_BLOCK
 - NEIGHBOURHOOD
 - X (Latitude)
 - Y (Longitude)
- Data years ranged from 2003 - 2019

Exploratory Data Analysis

- 624,038 rows
- Breakdown of 'Type' of Crime

Theft from Vehicle	209609
Mischief	83970
Break and Enter Residential/Other	66378
Other Theft	64611
Offence Against a Person	62078
Theft of Vehicle	41528
Break and Enter Commercial	38916
Theft of Bicycle	31112
Vehicle Collision or Pedestrian Struck (with Injury)	25294
Vehicle Collision or Pedestrian Struck (with Fatality)	290
Homicide	252

Name: TYPE, dtype: int64

Exploratory Data Analysis

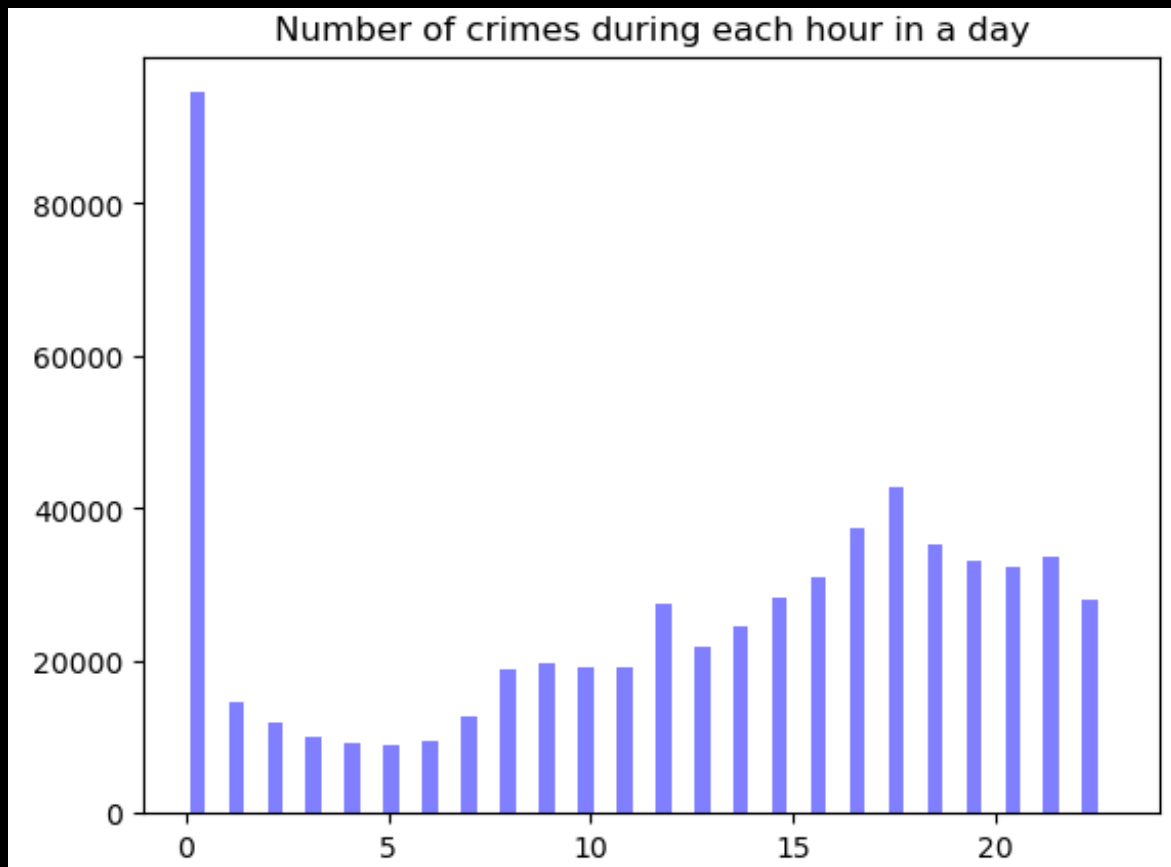
- Day and Night column added (Day = 7am-7pm, Night = 7pm-7am)

	TYPE	YEAR	MONTH	DAY	HOUR	MINUTE	HUNDRED_BLOCK	NEIGHBOURHOOD	X	Y	day_night
0	Break and Enter Commercial	2012	12	14	8	52	NaN	Oakridge	491285.000000	5.453433e+06	day
1	Break and Enter Commercial	2019	3	7	2	6	10XX SITKA SQ	Fairview	490612.964805	5.457110e+06	night
2	Break and Enter Commercial	2019	8	27	4	12	10XX ALBERNI ST	West End	491007.779775	5.459174e+06	night

Hypothesis Testing

- Are the number of thefts occurring throughout the day evenly distributed?
- H_0 : There are is no difference in the number of thefts which occur during the day and night
- H_1 : There is a difference in the number of thefts which occur during the day and night

Data Visualisation



Summary

- Results inconclusive due to failed hypothesis test
- However we can say there is an almost equal distribution of crimes between day and night:

Time	Crime Count
Day	302609
Night	321429

Next steps

To deliver more accurate results:

- Compare by years of data to identify increases or decreases in number of crimes
- Compare days of the week
- Visualising by neighbourhood and type of crime

References

- <https://vancouver.ca/news-calendar/population.aspx>
- <https://web.archive.org/web/20200103001454/http://vancouver.ca/police/organization/index.html>
- <https://www.kaggle.com/datasets/agilesifaka/vancouver-crime-report>