Montreal Hockey Shoots into Crime
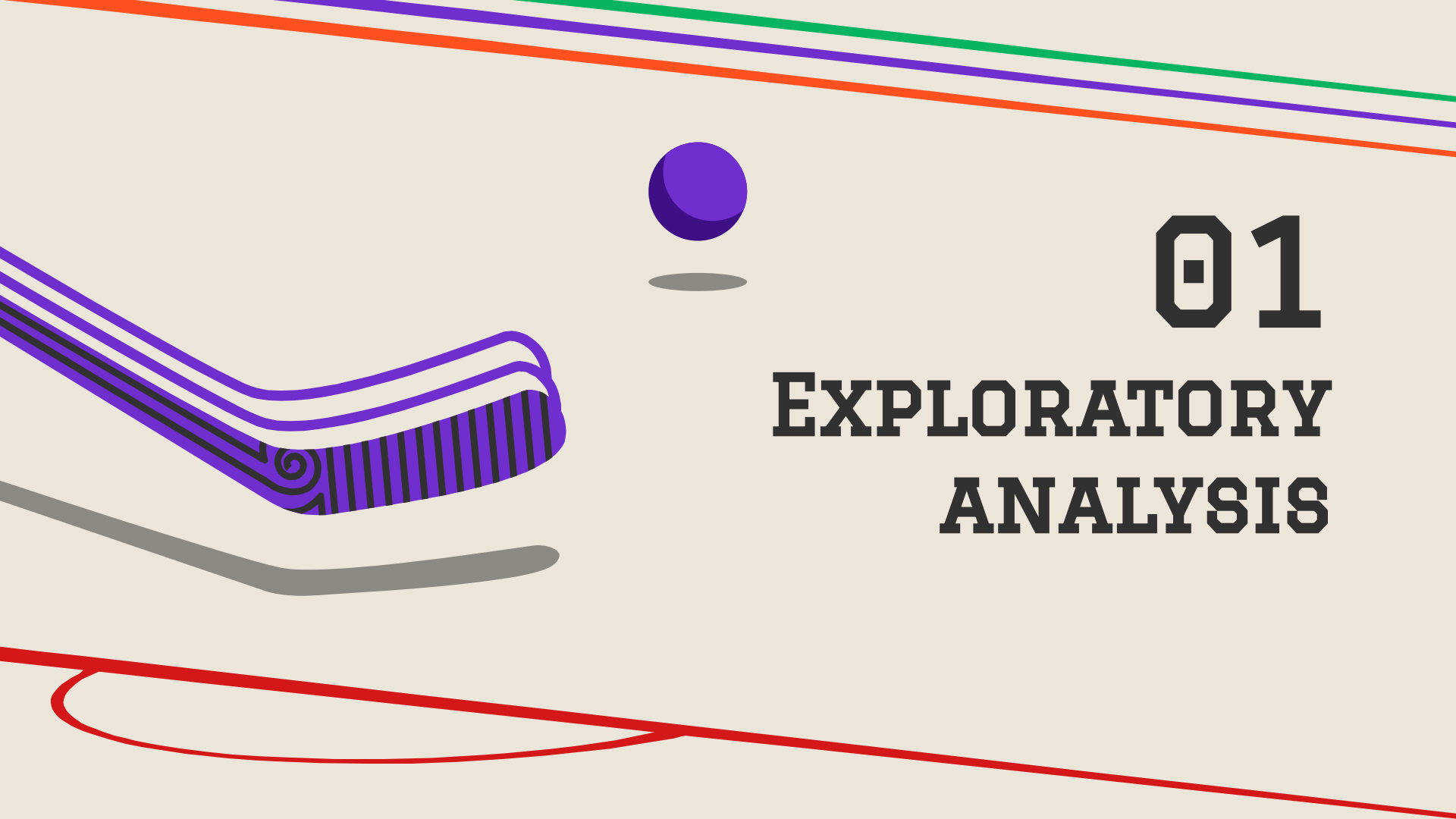
Tyler Brown, Anthony Cusimano, Lawrence Lu, Ryan Sakuma

Overview

01
Exploratory analysis

Influence of Crimes Per Month
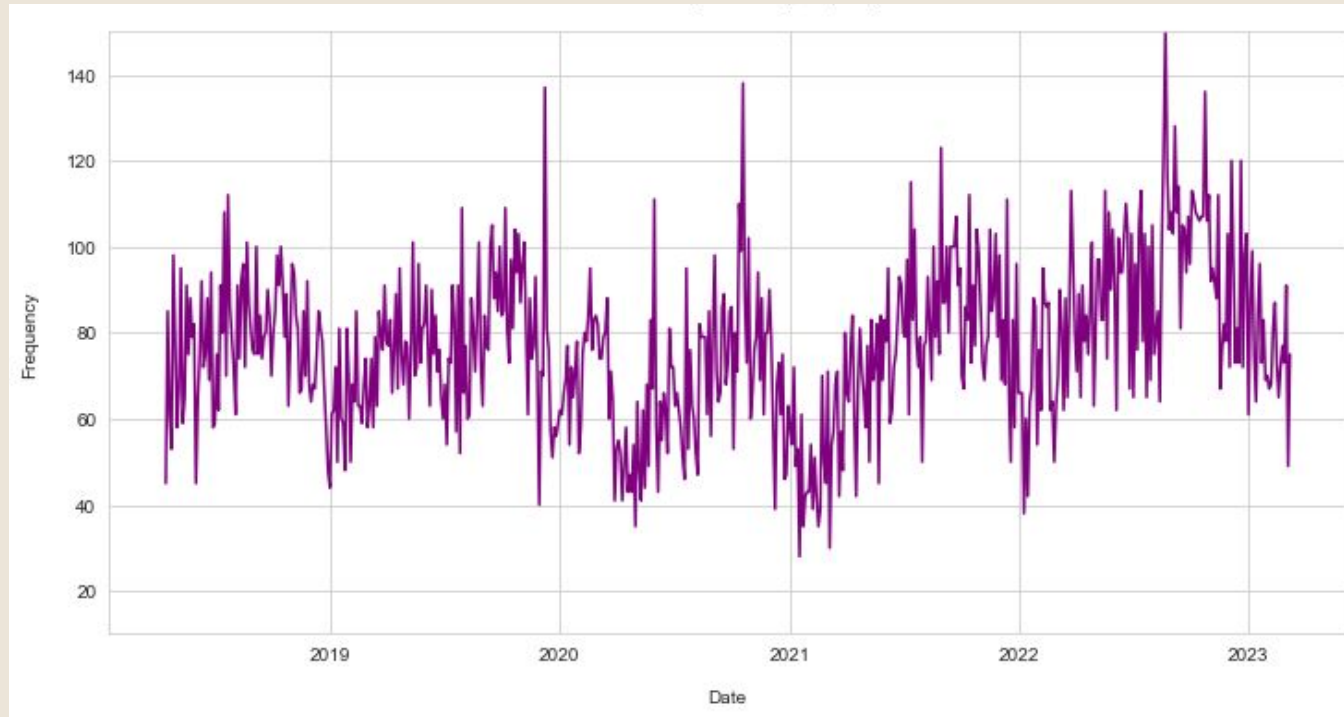
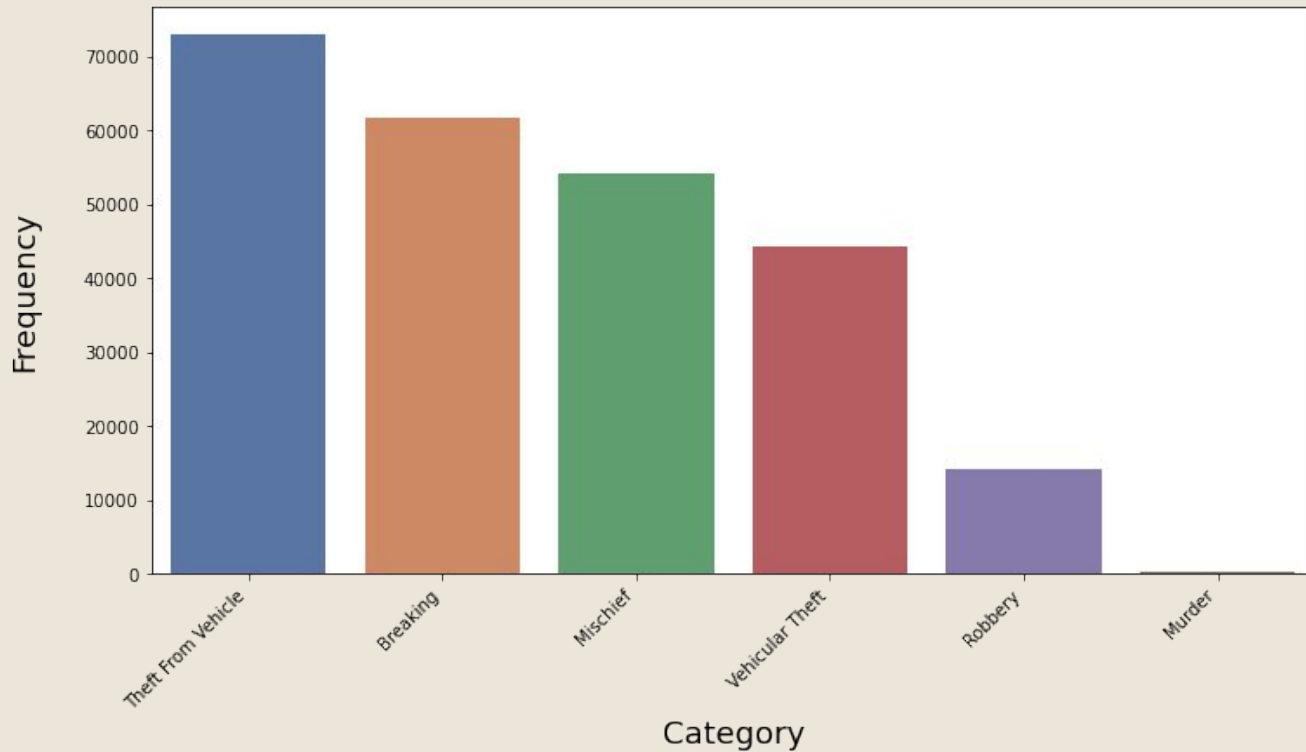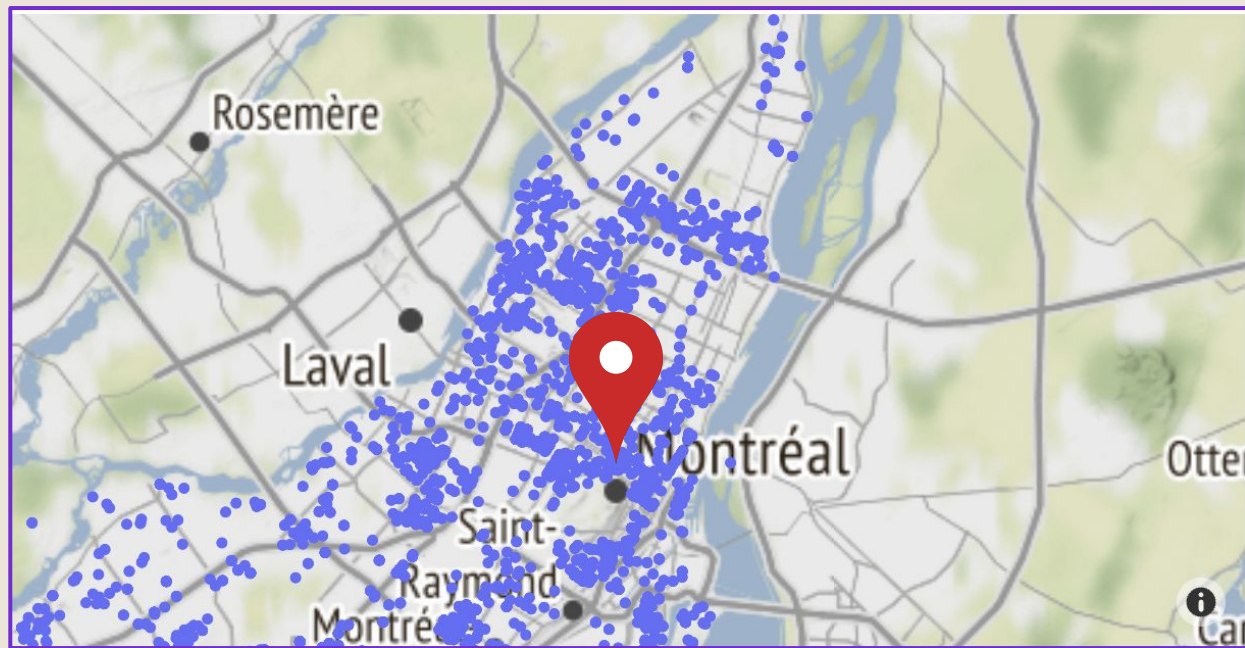# Types of Crimes Committed

Using geographical data, we discovered a **high density of crimes** near Centre Bell, the home arena of the Montreal Canadiens, prompting deeper exploration.
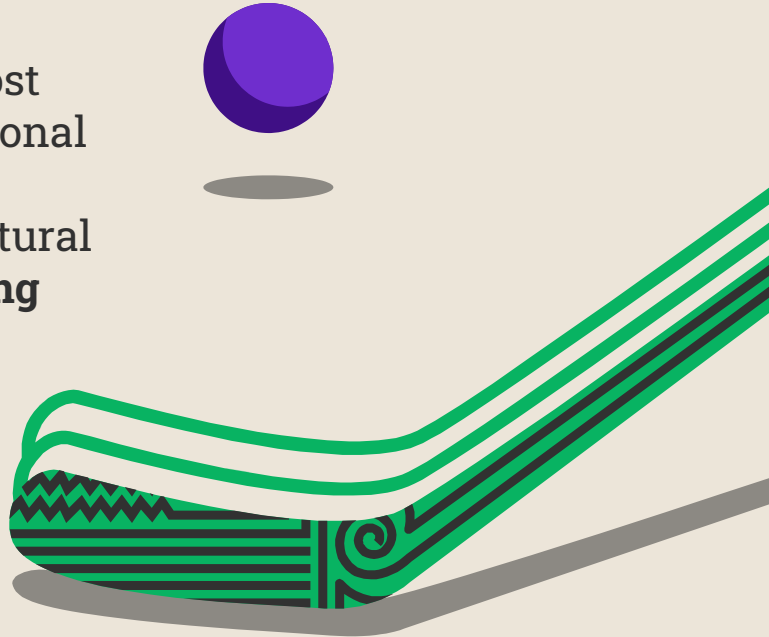
02

Problem Formation

What can we learn from Montreal's crime history?

Our Thought Process

As many people know, hockey is one of the most beloved creations of Canada, becoming their national sport and the pride and joy of many young Canadians. However, has this passion for the cultural heritage ever **become the catalyst for something more sinister?**

The Question Our Team Explored

How does the Montreal Canadiens hockey team win/loss outcome impact the crime rates in Montreal?
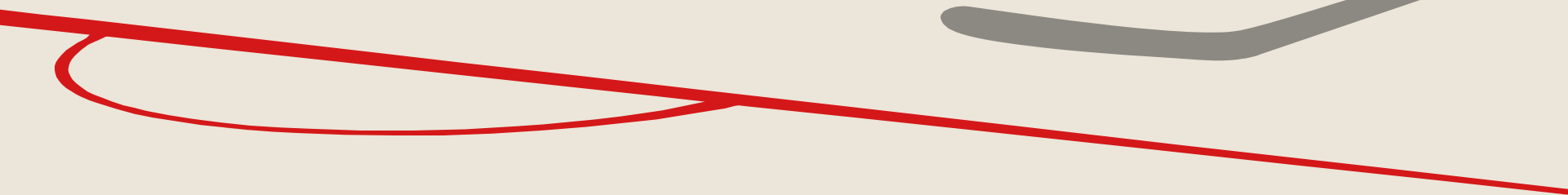
Determining The Relationship

We set out to determine if there was a correlation between whether the team won and how many crimes were committed that day and the day after

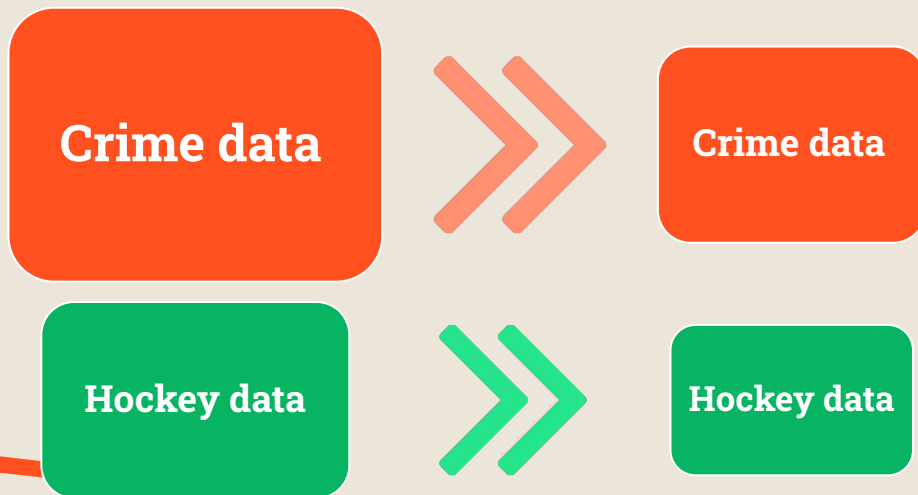# 03
Data Processing

Our process

Step 1 - Data Filtering

We **filtered the crime and hockey data** for the features we needed, and performed data cleansing.

| Crime data | » | Crime data |
| Hockey data | » | Hockey data |

Our process

Step 2 - Dataset Organization

We split the hockey data in two: games where the Montreal Canadiens **won**, and games they **lost**.

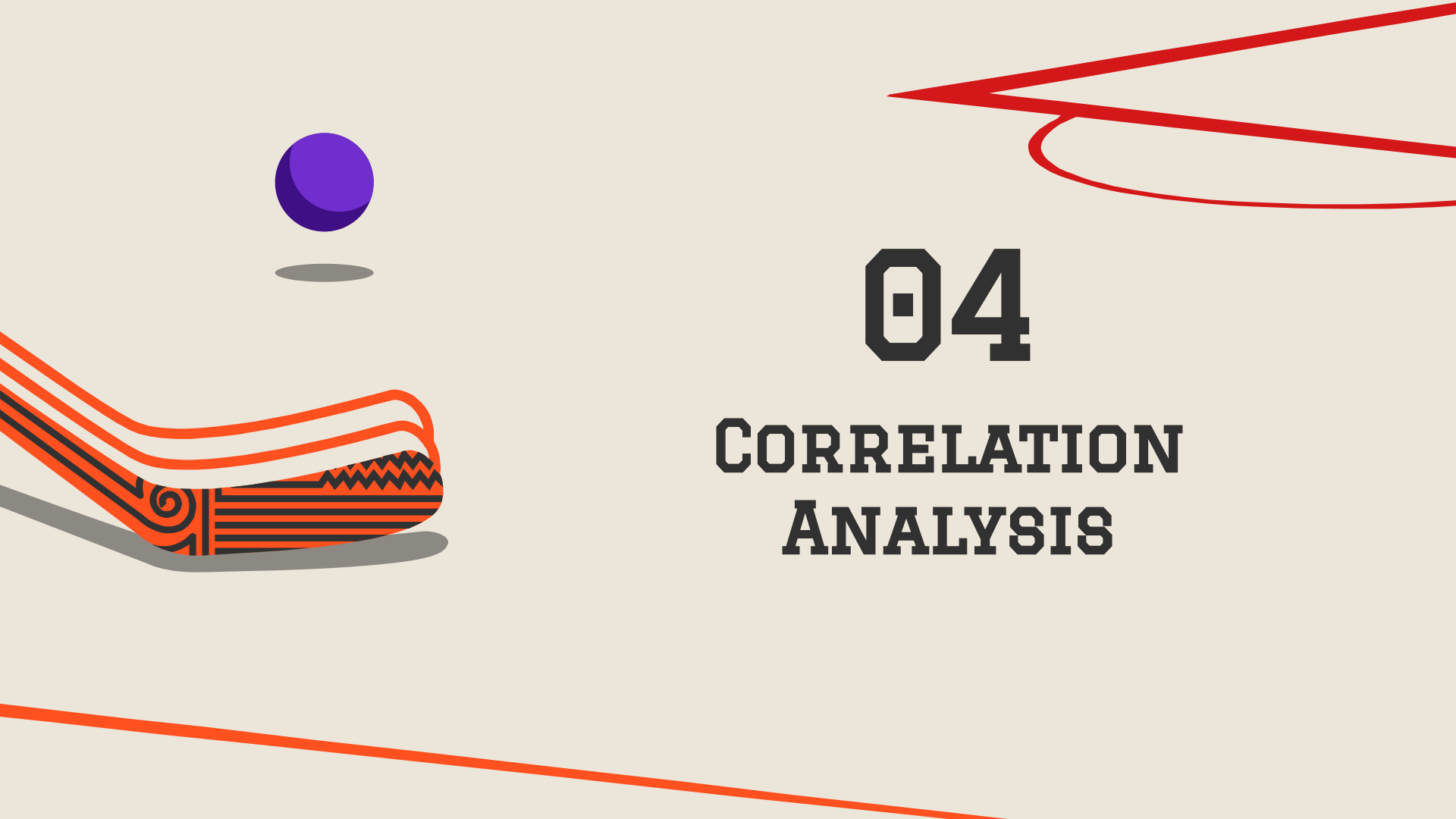**Hockey data** → **Win Data**

Hockey data → **Lose Data**

Our process

Step 3 - Merging

After preprocessing, we **merged crime information** to the dates on which the hockey team won or lost.

Crime Data

+

Win Data

Loss Data
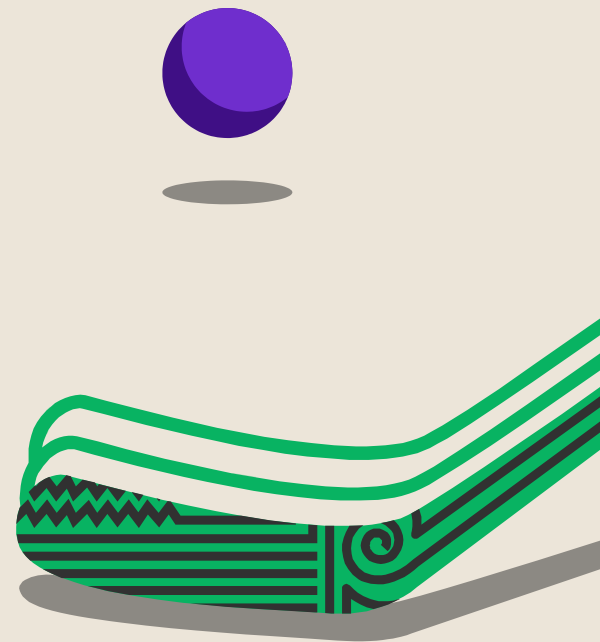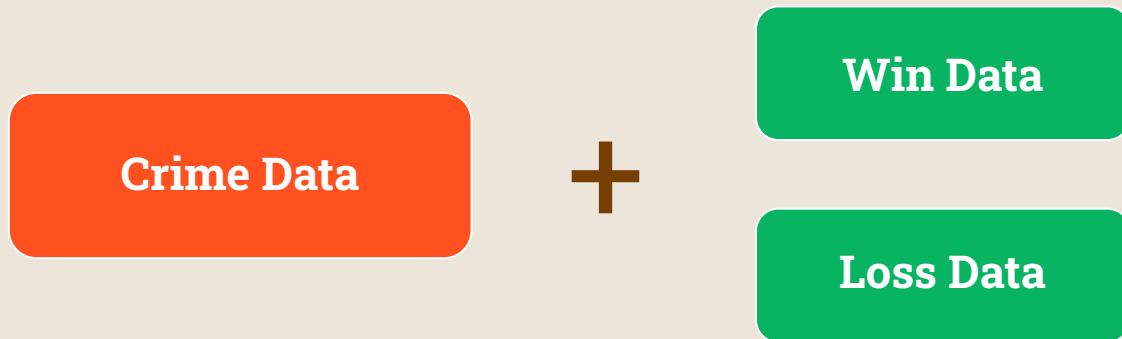
04

Correlation Analysis

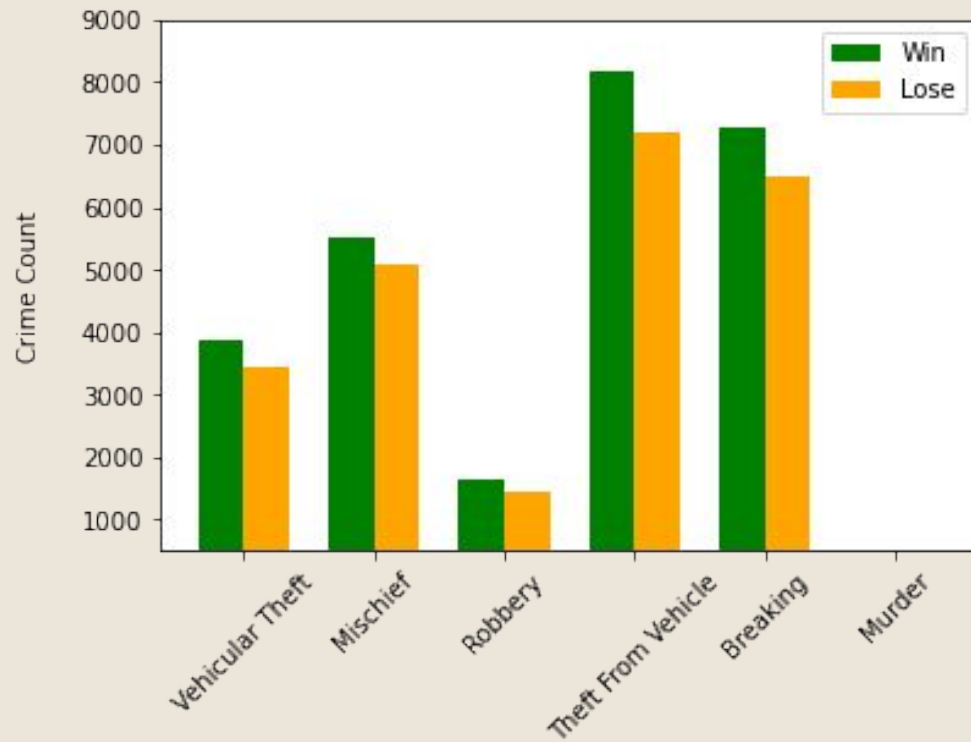# Correlation Analysis

We discovered a **significantly larger number of crimes** when the Montreal Canadiens <u>win</u>.

■ **WIN**

■ **LOSS**

Crimes Consistently Higher When Montreal Hockey Team Wins

Bar chart with y-axis "Crime Count" ranging from 1000 to 9000, and x-axis categories: Vehicular Theft, Mischief, Robbery, Theft From Vehicle, Breaking, Murder. Legend: Win (green), Lose (orange).

Welch's two-Sample T-test And Linear Regression

- The "t-test" allows us to see if two variables are correlated.
- Our test (by the very small "p-value") shows that **winning IS correlated with crime rates**.
- Furthermore, a Linear-Regression Model displays an **increased expectation of crime** by 2 incidents after a win

```
            Welch Two Sample t-test

data:  data$outcome and data$Total_Crime
t = -91.443, df = 320.07, p-value < 2.2e-16
```

05

What Our Data Means

Knowing this, what can Montreal do?

Policy Proposals

Alcohol Restrictions

Restricted purchase and consumption on game days

Upgraded Policing

Increased officer patrols on the streets during or after games

Awareness Efforts

Launch awareness campaigns for fans using social media to warn them about potential crime spikes during hockey season

Curfew

Propose a full or limited city curfew to reduce criminal risk on game nights

Anti-Hockey Initiatives

Defund the Canadiens

Given the clear statistical connection between crime and Montreal's NHL team, we propose that the city restrict public funds from fueling this criminal enterprise

RELOCATE THE Canadiens

A further step would be to push for the removal of Hockey in the city of Montreal. They team would be moved to a less intense urban environment. The city of Irvine, California, USA.

06

Next Steps And Limitations

Knowing this, what can Montreal do?

1. With more time, we would have performed **deeper statistical testing** between win/loss data and a control group.

2. Confounding variables exist, so our next step would be to **investigate how other factors affect our results**.

Data Sources

Crime Data
- Provided by StrataScratch for this Datathon

Hockey Data
- https://www.kaggle.com/datasets/martinellis/nhl-game-data?select=game.csv