BIXI PROJECT PART 1

Data Analysis in SQL

BIXI MONTRÉAL

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Introduction

A non-profit organization is looking to attract more riders into their membership program. The director of marketing believes the company's future success depends on maximizing the number of annual memberships. Therefore, the marketing analytics team wants to gain a high-level understanding of how people use Bixi bikes, what factors influence the volume of usage, popular stations, and overall business growth. From these insights, the team will design an innovative marketing strategy to convert non-members into members.

About The Company

BIXI Montréal is a non-profit organization created in 2014 by the city of Montreal to manage its bike-sharing system. The BIXI network has more than 9,500 bikes and 700 stations spread out across the areas of Montreal, Laval, Longueuil, Westmount, Town of Mount Royal and Montreal East. Much more than just a simple mode of transport, BIXI is now a wonderful way to zip around the city whenever you want to go wherever your heart desires.

How does BIXI work?

1. Purchase a membership or a one-way pass
2. Take a Bike
3. Cycle
4. Return the bike

Key Business Task

The key business task is to find out how people use Bixi bikes. The insights gathered here can help stakeholders re-allocate resources to key areas, resulting in greater awareness for customers and more annual memberships.

About the Data

Bixi historical trip data can be downloaded in the following link. Data. (Note: The data has been made available by BIXI MONTRÉAL under this policy.) This is public data that anyone can use to explore how different members are using Bixi bikes. Note that data-privacy issues prohibit anyone from using riders' personally identifiable information. This means that pass purchases to credit card numbers to determine if riders live in the service area will not be permitted.
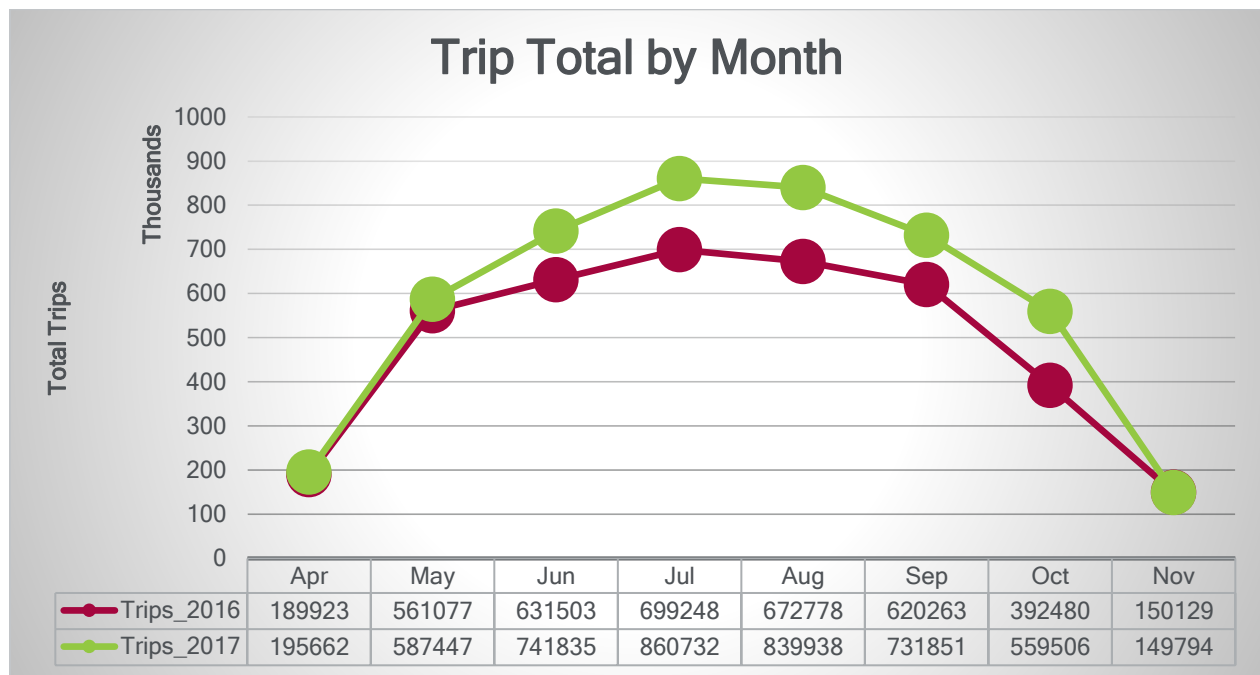
Exploratory Analysis

Exploring Volume of Bixi Bikes Usage

First, we will attempt to gain an overall view of the volume of Bixi Bikes usage and what factors influence it.

Exploring the total amount of trips throughout 2016 and 2017 by month.

Trip Total by Month

|	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Trips_2016	189923	561077	631503	699248	672778	620263	392480	150129
Trips_2017	195662	587447	741835	860732	839938	731851	559506	149794

Findings

- There is an approximately 19% increase in rider trips over the year.
- Both years, riders become active from April to November, and inactive from December to March.
- The trend is the similar for both years where we see a steady increase peeking in July, and a downward trend until November where activity stops. Is this behavior correlated with temperature?

Exploring Temperature Patterns

Using data from [WeatherSpark](https://weatherspark.com), we can begin to explore the temperature patterns in Montreal of 2017.

Montréal Temperature History 2017
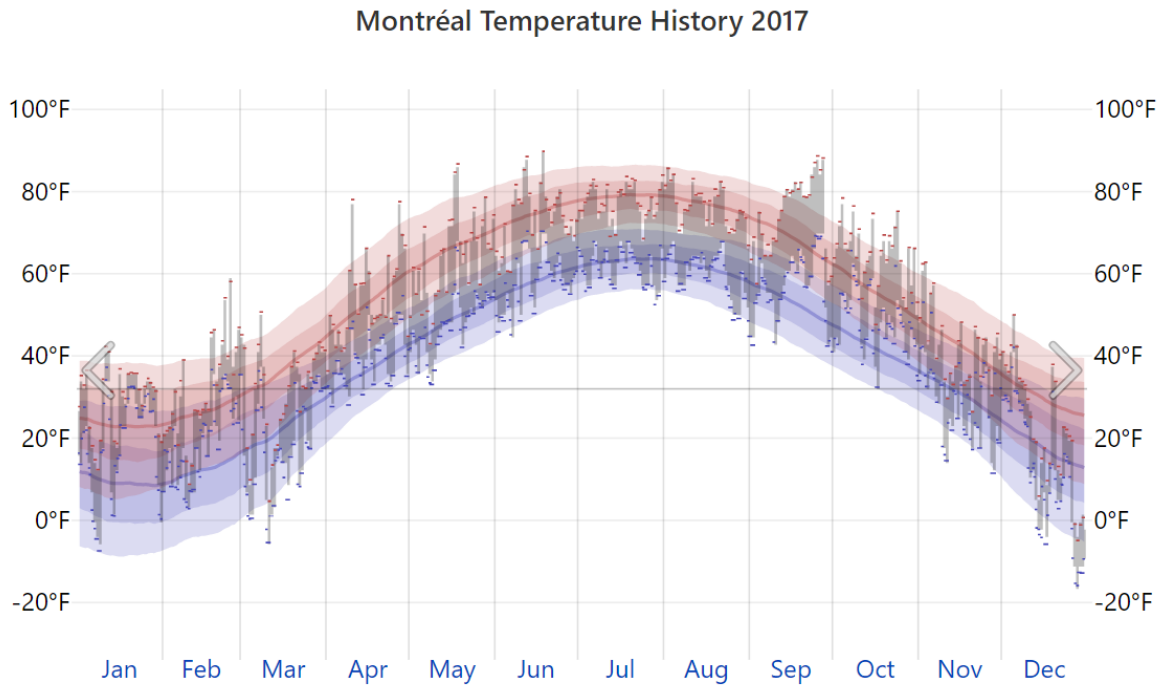
Findings

- The temperature patterns closely resemble the average trips throughout the year.
- These matching trends indicate the weather directly effects the number of riders that are active throughout the year.
- This explains why we do not see any trips during the colder months.
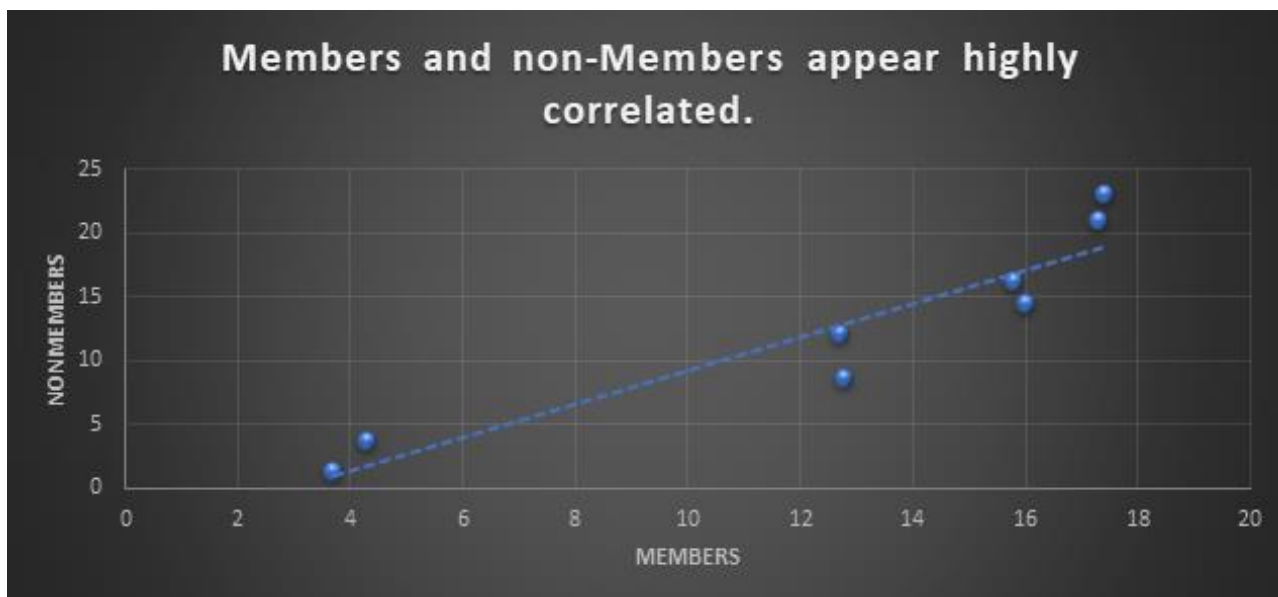
Membership vs non-Membership

Unsurprisingly, the number of trips varies throughout the year. How about membership status? Should we expect member and non-member to behave differently?
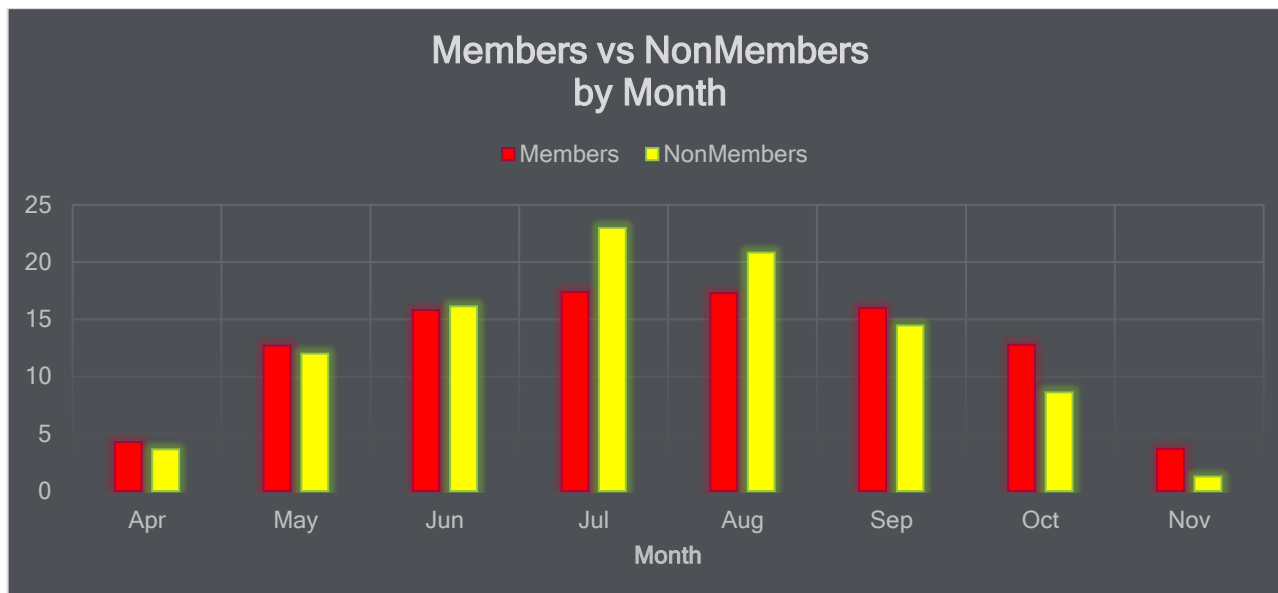
Findings

- Approximately 81% of riders are members, and 19% are non-members.
- The highest demand for Bixi bikes is during Jun, July, and Aug. Totals approximately 50% of total riders in 2017.
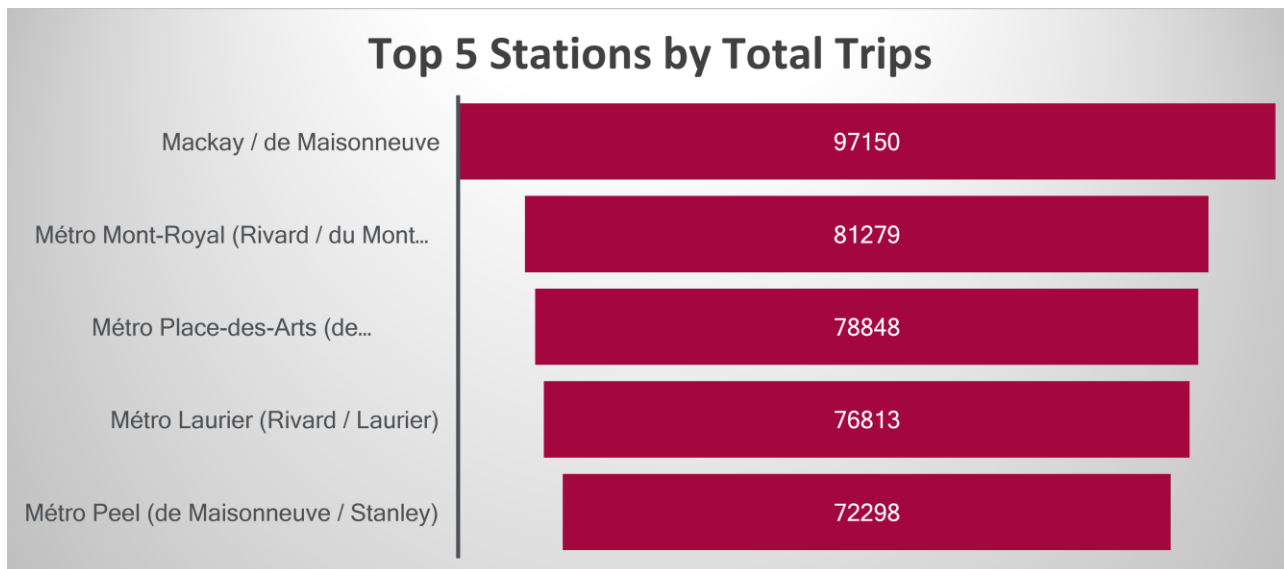
Exploring the correlation

Findings

- Members and non-Members do not behave differently.
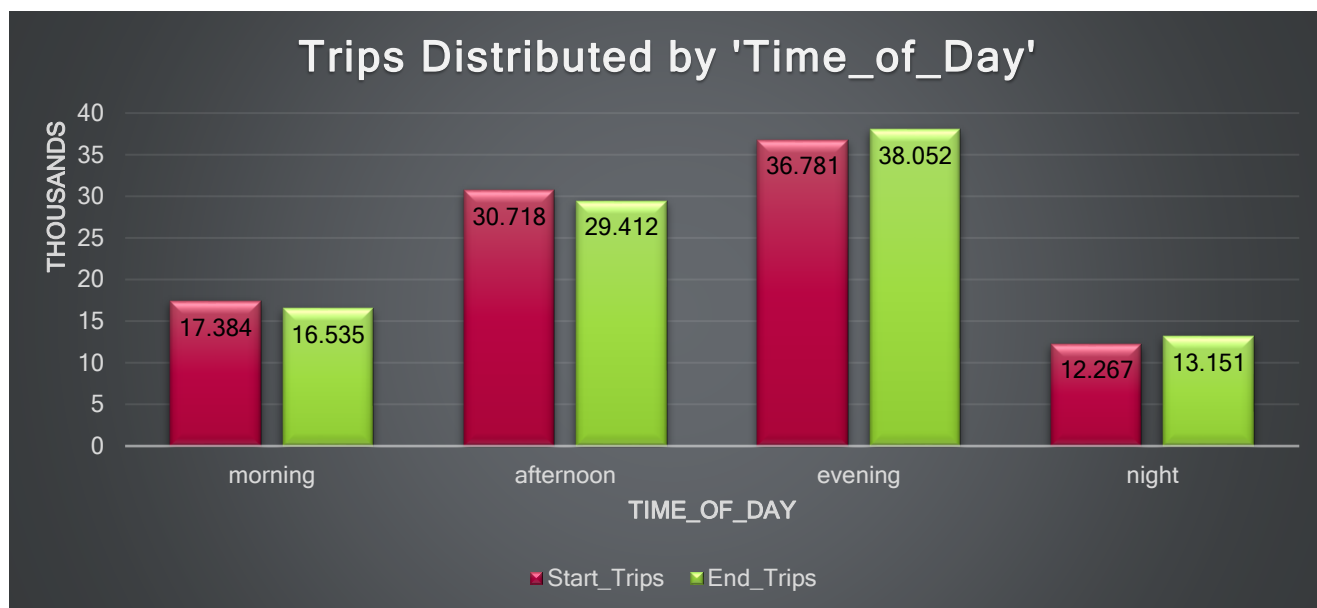
Exploring Popular Stations

It is clear now that average temperature and membership status are intertwined and influence on how people use Bixi bikes. Let us try to bring this knowledge with us and learn something about station popularity.

Top 5 Stations by Total Trips

Station	Total Trips
Mackay / de Maisonneuve	97150
Métro Mont-Royal (Rivard / du Mont…)	81279
Métro Place-des-Arts (de…)	78848
Métro Laurier (Rivard / Laurier)	76813
Métro Peel (de Maisonneuve / Stanley)	72298

Findings

- Mackay / de Maisonneuve is the most popular station.

Being the most popular, we can begin to explore how the trips in Mackay / de Maisonneuve are distributed.

Trips Distributed by 'Time_of_Day'

TIME_OF_DAY	Start_Trips	End_Trips
morning	17.384	16.535
afternoon	30.718	29.412
evening	36.781	38.052
night	12.267	13.151

Findings

- Riders prefer to start and end their trips in the evenings at Mackay / de Maisonneuve

Exploring Popular Stations Continued

Findings

- the majority of high fraction round trips are located in high-traffic areas.
- Some notable areas include St. Helen's Island, Nuns' Island, and Angrignon Park.
- These areas are mainly known for tourist attractions, and large biking trails which are an ideal place to place Bixi stations.

Summary

By analyzing the historical trips data we have seen that:

- Riders are active from April to November, and inactive from December to March.
- Temperature is directly related to the amount of riders are active.
- Members and nonMembers are also related, meaning they change together at a constant rate.
- There is a peak demand in July, during the summer season.
- Mackay / de Maisonneuve is the most popular station by the number of trips recorded.
- Riders prefer to start and end their trips in the evenings.

RECOMMENDATIONS

The final recommendations for the marketing strategy that aims to convert nonMember riders into members are:

- Create more options for memberships that target the evenings, and during the summer months.
- Charge different rates for the most popular stations.
- Messages about the comfort of the bikes and the different options that suits every single user may be well received. Even some announced improvement of the bikes on comfort, like improved seats or handlebars, could be considered if there is budget enough.
- Explore combined package offers with other service providers, eg. fitness training with bikes programs, exploring the city with tour guides, and/or family activities with kids programs.

Some ideas about the advertising:

- Always with references to the recreational use of riding: sports, family days, city tours, etc.
- Digital advertising about leisure on social media platforms like Instagram, Facebook, Twitter, etc...
- Flyers or brochures in high traffic stations.