Real Estate Project

Group 1:
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*** See our project on GitHub at https://github.com/alexandrachan7/CIS-9650-Group-1

Agenda

- Introduction

- Analysis

  - Factors that affect selling price

  - Sale price prediction

  - Price Analysis on Property

  - Population Trends Between NYC Community Districts

  - Performance

- Challenges

- Data Resources

Introduction

Project Idea: Our goal is to help our clients making better investment decisions in New York City real estate through the analysis from different aspects

[1] Assume our clients have a lot of money and would like to do some investments in real estate. They are seeking recommendations about the houses with different characteristics.

[2] Assume our clients purchase the condo/house, explore the NOI and recommend if they should rent the condo/house.

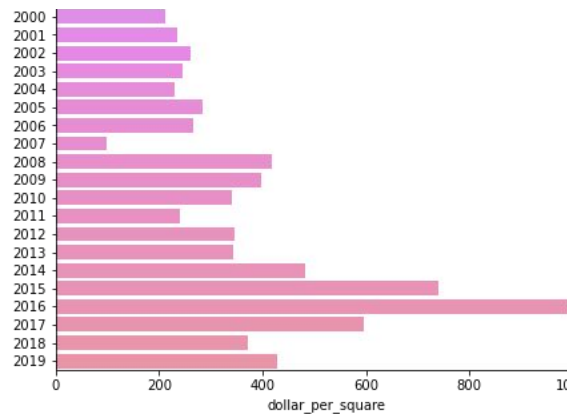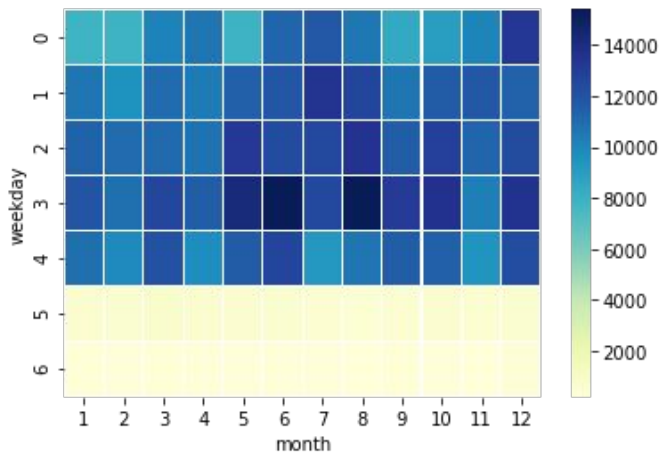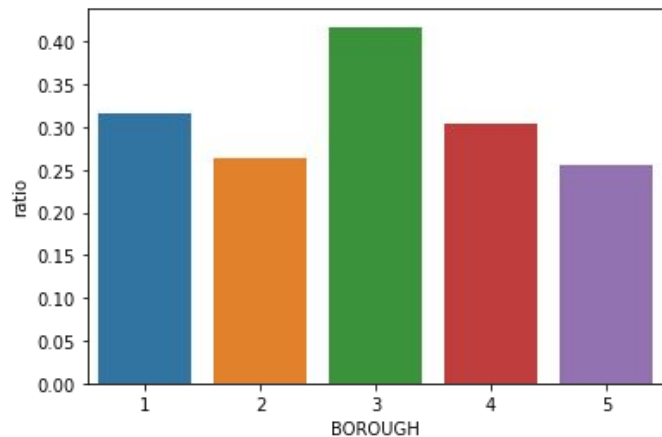# Factors that affect selling price
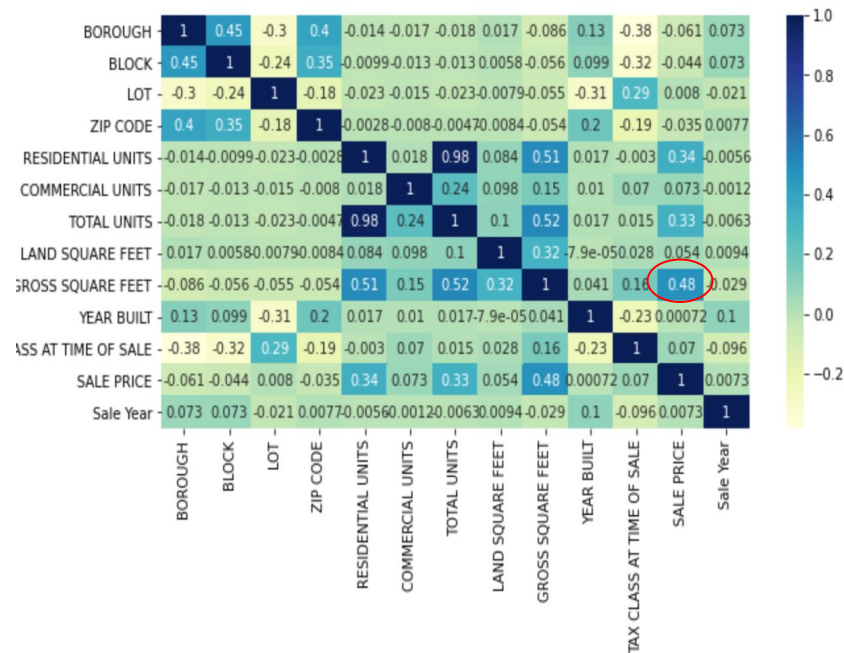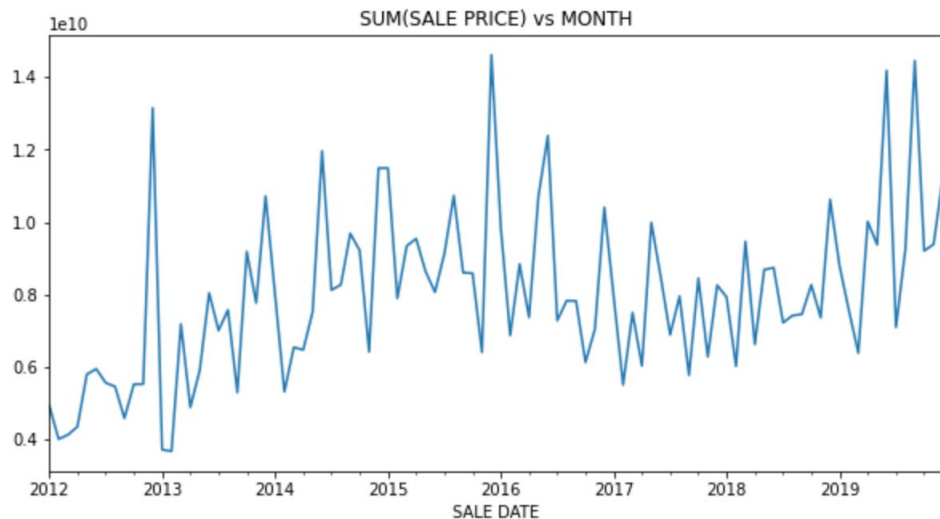
Predicting Sale Price-User Input

1. Predicting house prices based on user input
    1.1. Ask the user to enter desired borough, houses type , **desired gross square feet** and year built
    1.2. Find the historic sales price in the dataset based on similar borough, similar house type, and the closest difference in gross square feet and year built.
    1.3. Find the **average sale price per square feet** based on searched result (Sale price/gross square feet)
    1.4. Find the **increase percentage** b/w sales price in 2018 and 2019
    1.5. Use the formula **desired gross square feet*** **average sale price per square feet***(1+**increase percentage**) to predict sale price for the user.
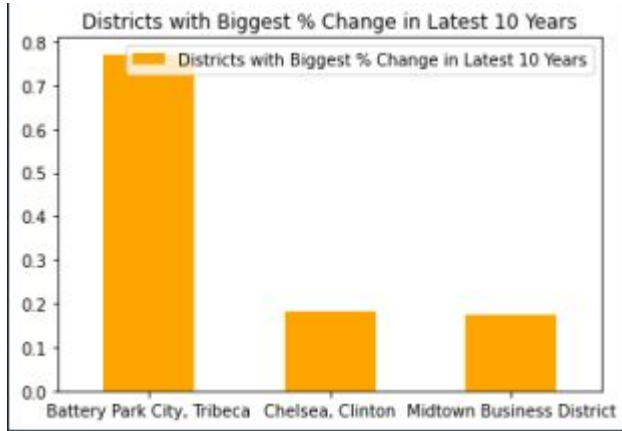
Price Analysis on Property

Brooklyn has the highest percentage of 0 price properties:40%;
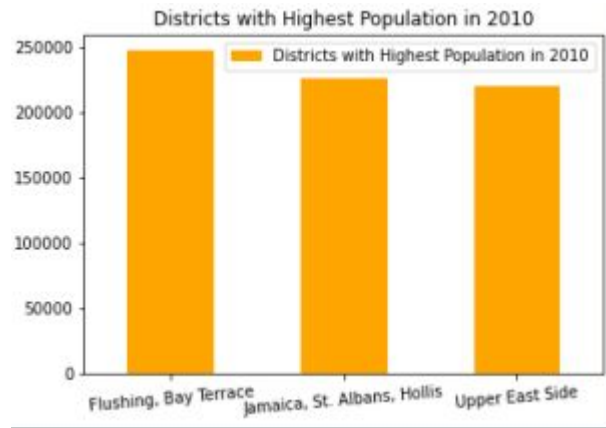
Summer has the highest transactions: June to August;

2016 has highest housing price per square feet from 2000 to now.

Population Trends Between NYC Community Districts

Districts with Biggest % Change in Latest 10 Years

Districts with Highest Population in 2010

Between 1970 - 2010, the biggest population growth was found in districts of Manhattan & Staten Island
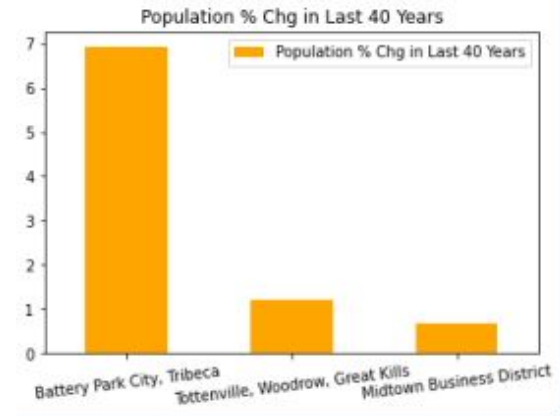

Population % Chg in Last 40 Years

Between 2000 to 2010, there was an influx of people moving into Mid to Lower Manhattan

The highest populated districts in 2010 were Flushing, Jamaica, and Upper East Side

Performance

Based on the programs, here are the outputs in terms of **real estate's performance**:

```
Top 3 neighborhoods for 2012 - 2015
Neighborhood           Borough Name
CYPRESS HILLS          Brooklyn        0.198701
WILLIAMSBURG-CENTRAL   Brooklyn        0.181338
WINDSOR TERRACE        Brooklyn        0.176644
dtype: float64
```

```
Top 3 neighborhoods for 2016 - 2019
Neighborhood           Borough Name
MOTT HAVEN/PORT MORRIS The Bronx       0.155955
CASTLE HILL/UNIONPORT  The Bronx       0.152240
BROWNSVILLE            Brooklyn        0.149838
dtype: float64
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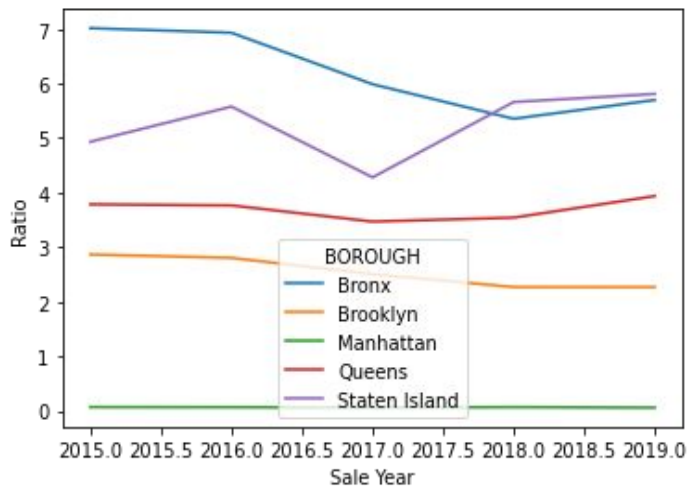


```
In 2019, the top 5 neighborhoods supplied most condos are listed below:
BOROUGH     NEIGHBORHOOD
Brooklyn    BEDFORD STUYVESANT    819
            EAST NEW YORK         814
            BOROUGH PARK          664
            FLATBUSH-EAST         624
Queens      FLUSHING-NORTH        621
Name: ADDRESS, dtype: int64

In 2019, the top 5 neighborhoods supplied most houses are listed below:
BOROUGH     NEIGHBORHOOD
Manhattan   UPPER WEST SIDE (59-79)    771
            UPPER EAST SIDE (59-79)    605
Queens      FLUSHING-NORTH             573
Manhattan   UPPER EAST SIDE (79-96)    517
            MIDTOWN WEST               479
Name: ADDRESS, dtype: int64
```

Challenges

- Some of our data sets did not contain 2020 data
- The data sets contain many types of invalid data
- Limitation: Out of control
  - There are other factors that might affect the house price such as interest rate, economic growth and etc.

Data Resources and References

- **Annualized Sales Update:** https://www1.nyc.gov/site/finance/taxes/property-annualized-sales-update.page (NYC Department of Finance)
- **Cooperative Comparable Rental Income (Citywide):** https://data.cityofnewyork.us/City-Government/DOF-Cooperative-Comparable-Rental-Income-Citywide-/myei-c3fa (NYC Open Data)
- **New York City Population by Community Districts** - https://data.cityofnewyork.us/City-Government/New-York-City-Population-By-Community-Districts/xi7c-iiu2 (NYC Open Data)
- **Reference: [1.Capitalization Rate]:** https://www.rentalsoftware.com/capitalization-rate-cap-rate/#:~:text=The%20Cap%20Rate%20is%20computed,with%20a%20lower%20capitalization%20rate.

Questions?
Thank you.