



The COVID-19 Impact On The New York State Housing Market

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Problem Statement

- The housing market in New York State was affected to a great extent during the COVID-19 crisis in 2020. An urban region such as New York City and a suburb such as Westchester County experienced a dramatic change in their residential market. According to the Federal Reserve, supply of homes has fallen to historically low levels while price growth has increased exponentially during the pandemic. Such levels of supply and demand are unsustainable over time, hence the need to address this phenomenon.

Overview of Framework

1) Ask

- Define the problem
- Use structured thinking



4) Analyze

- Sort and filter data
- Identify patterns and draw conclusions
- Make predictions and recommendations



2) Prepare

- Identify and use different data formats, types, and structures
- Make sure data is unbiased and credible
- Organize and protect data



5) Share

- Create effective visuals
- Bring data to life
- Communicate to others



3) Process

- Crawl and transform data
- Clean data
- Test data

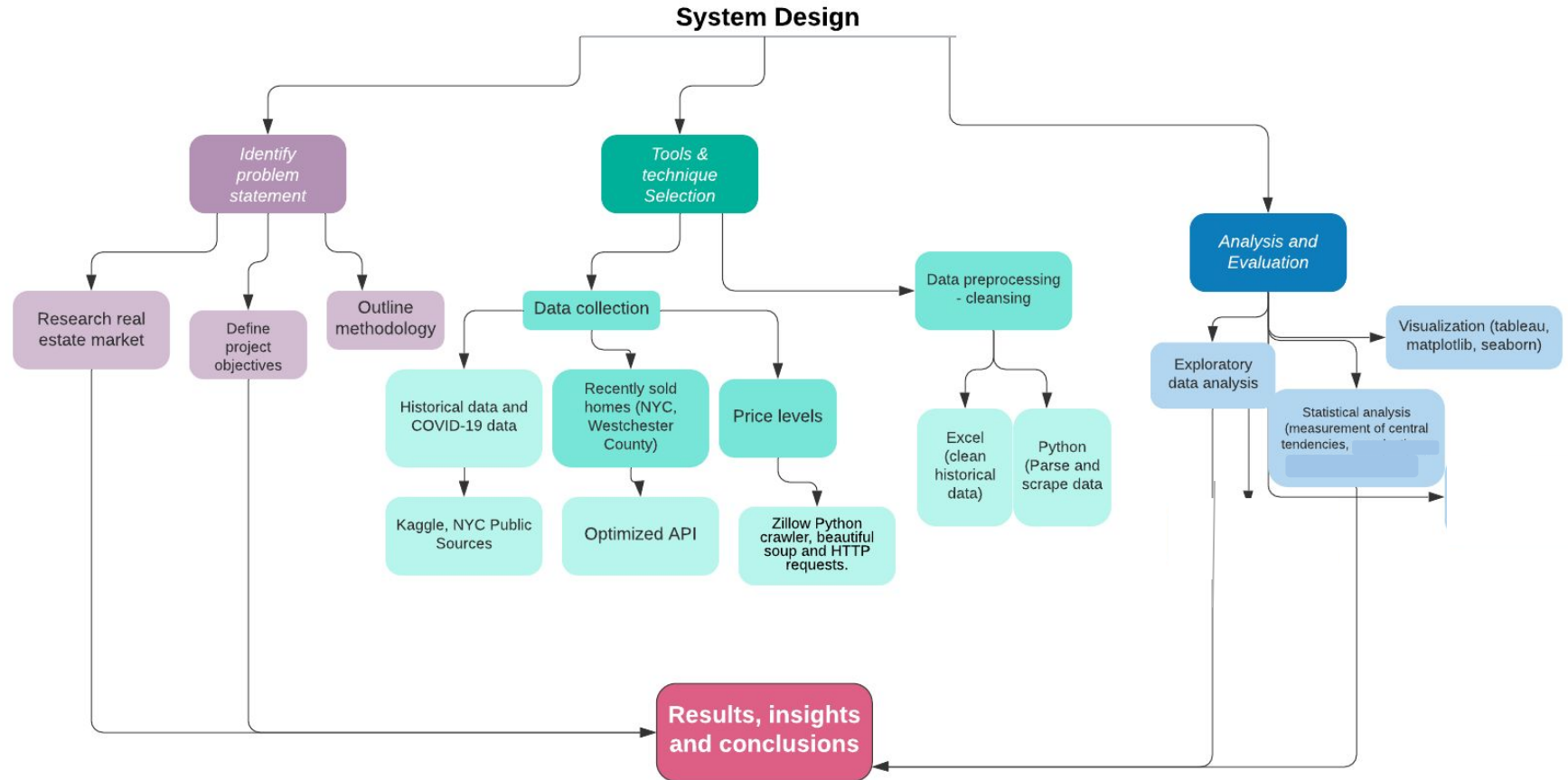


6) Act

- Apply Insight
- Make decisions



System Design



Datasets

- Our data comes from multiple sources: Internal and external

Data	Subject	Origin
Internal	<ul style="list-style-type: none">- New York City Property Sales 2021- New York State Covid-19 Case Counts 2020-2021	<ul style="list-style-type: none">- NYC GOV Dept. of Finance- NYS Dept. of Health
External	<ul style="list-style-type: none">- New York State Property Sales- New York City Property Sales 2019- 2020	<ul style="list-style-type: none">- Zillow Crawler HTTP- API- Kaggle (Public Database)

Data Description - NYS Property Sales

Data size: Sold homes for 2020: (26432 entries), Sold homes for 2021: (25194 entries), Recently sold homes: (500 entries)

Attributes	Description	Type
Borough Neighborhood	Borough/neighborhood where purchased occurred	Nominal
Zip Code	Area code where property is located	Nominal
Building Class at Present	Building classification at time of purchase - Residential, Mixed-Use, Commercial, Hospitality	Nominal
Sale Price	Purchase price of property	Numeric
Sale Date	Date of sale of property	Date

Data Description - NYS COVID Hospitalizations

Below is a description of the data for NYS Covid-19 Hospitalizations with some key data attributes:

Attributes	Description	Type
As of Date	Hospital reporting date through the Health Electronic Response Data System	Datetime
Facility County	The NY county that the facility is located within	Nominal
Patients Currently Hospitalized	How many confirmed positive Covid-19 patients does the facility have at this time?	Numeric

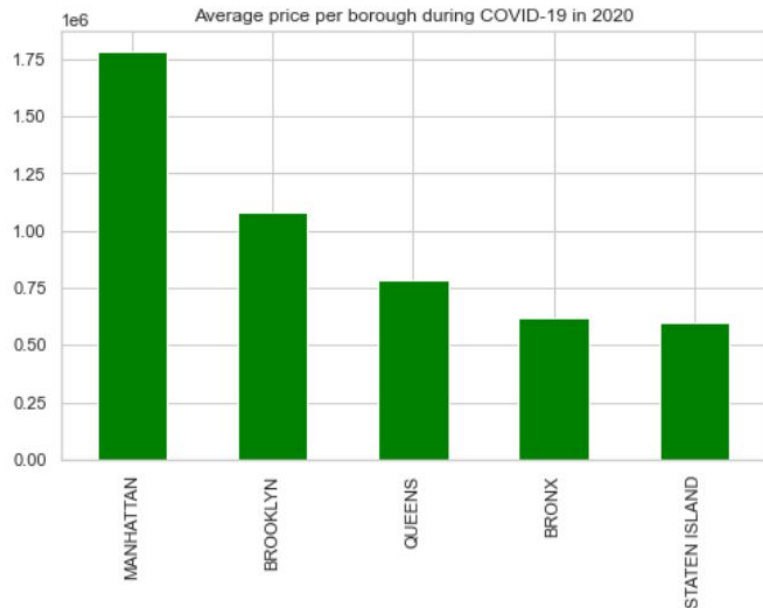
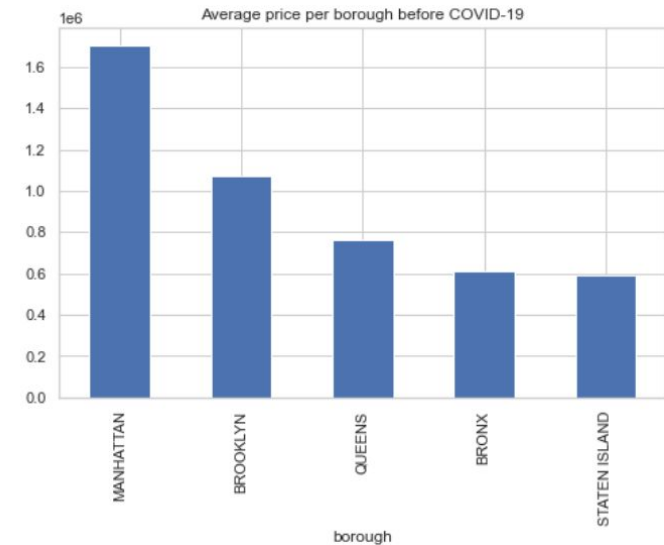
Analysis

```
In [174]: ▶ # Average price of sold homes before the pandemic  
filter1 = data2020.sale_date < "2020-03-13"  
beforeCovid = data2020[filter1]  
round(beforeCovid.price.mean())
```

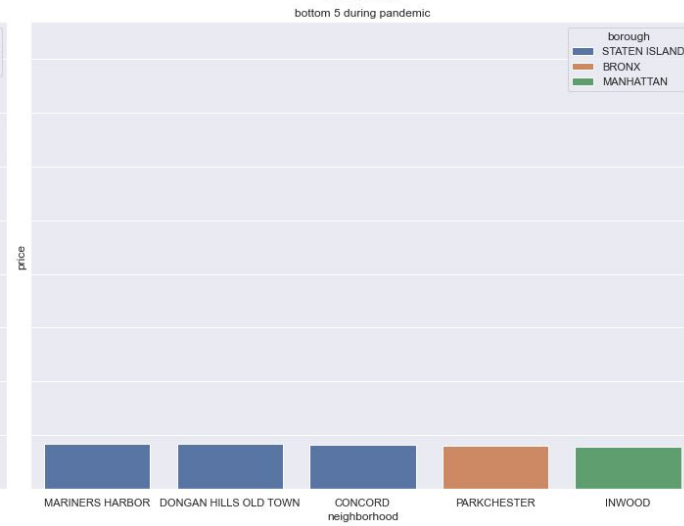
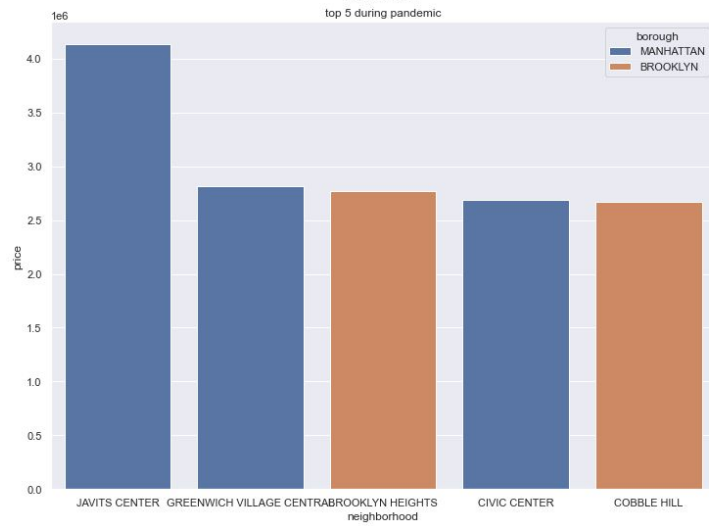
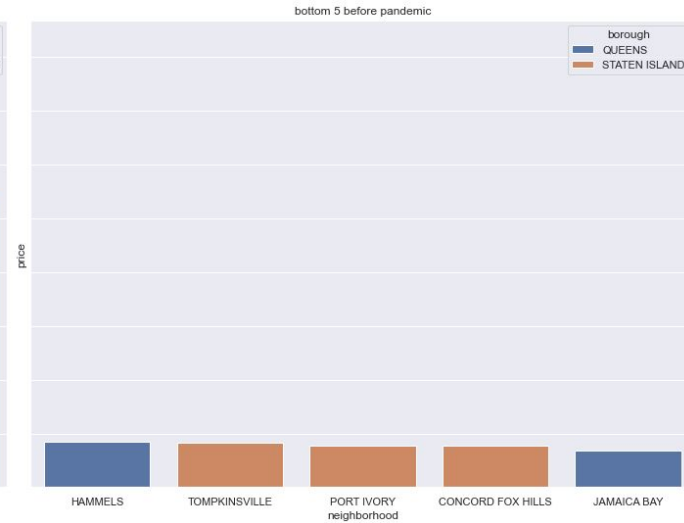
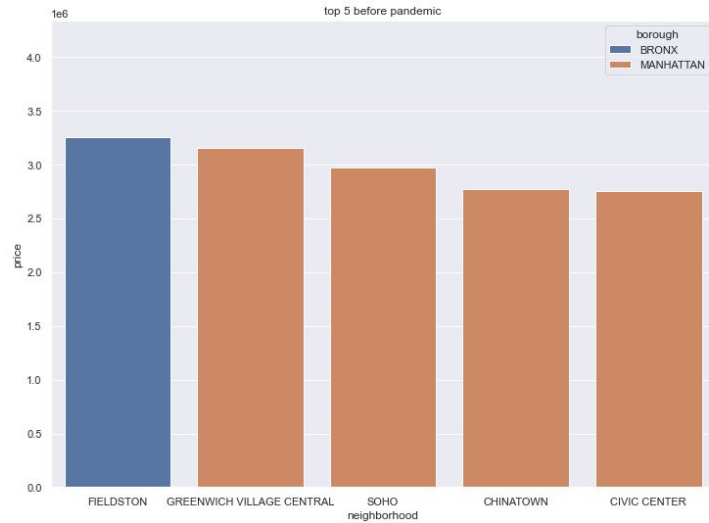
Out[174]: 938280

```
▶ # Average price of sold homes during the pandemic  
filter2 = (data2020.sale_date > "2020-03-13") & (data2020.sale_date < "2020-12-31")  
duringCovid = data2020[filter2]  
round(duringCovid.price.mean())
```

5]: 942500



Analysis II



Average price of homes according to building class

Before COVID-19

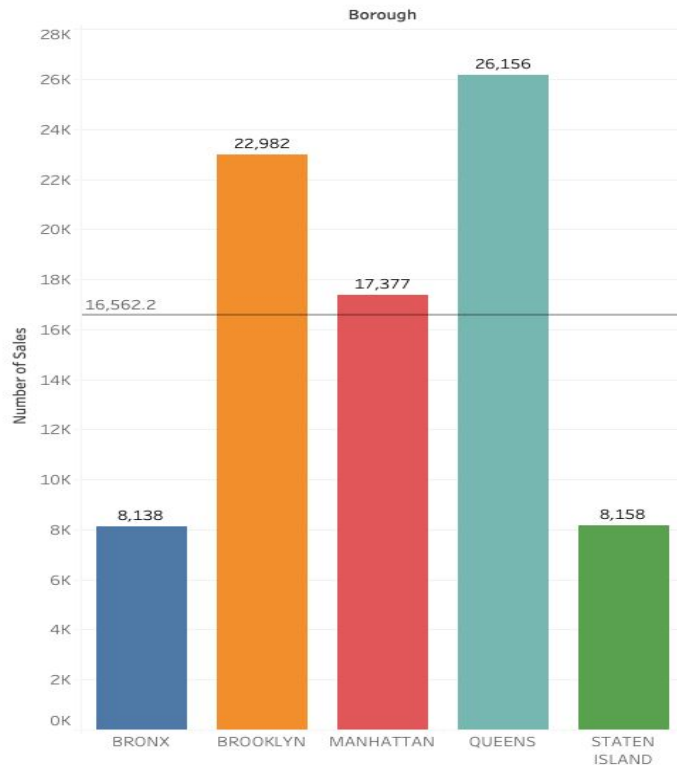


During COVID-19

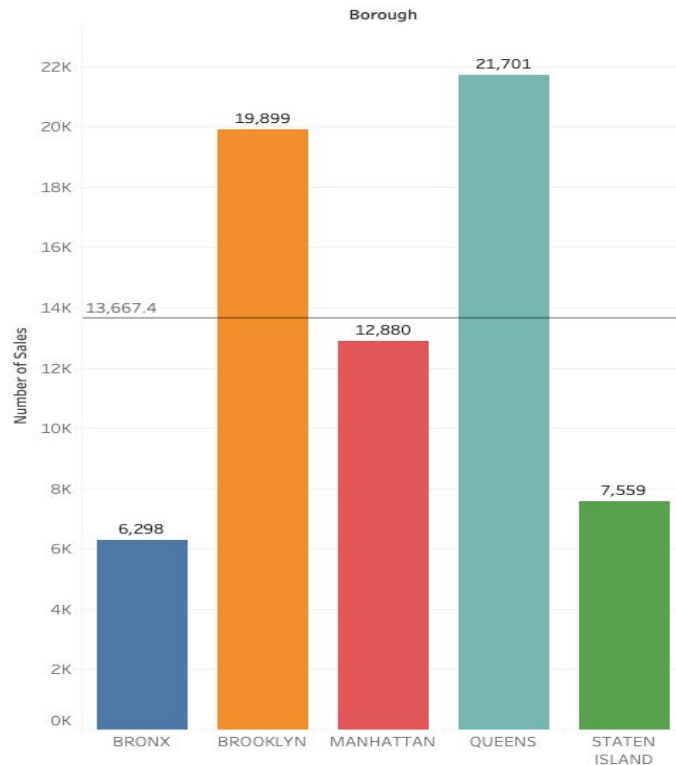


NYC - Sales Report

Number of Sales Per Borough 2019

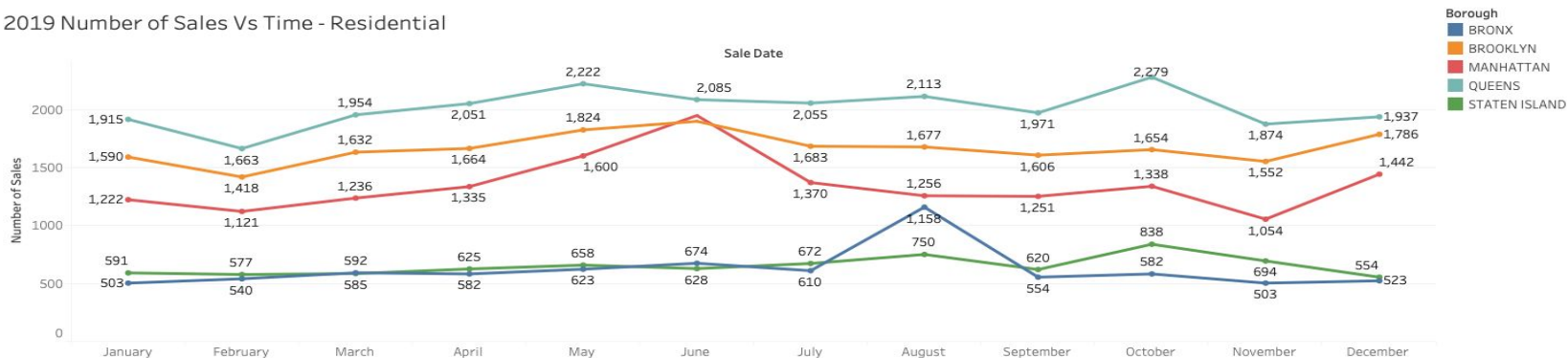


Number of Sales Per Borough 2020

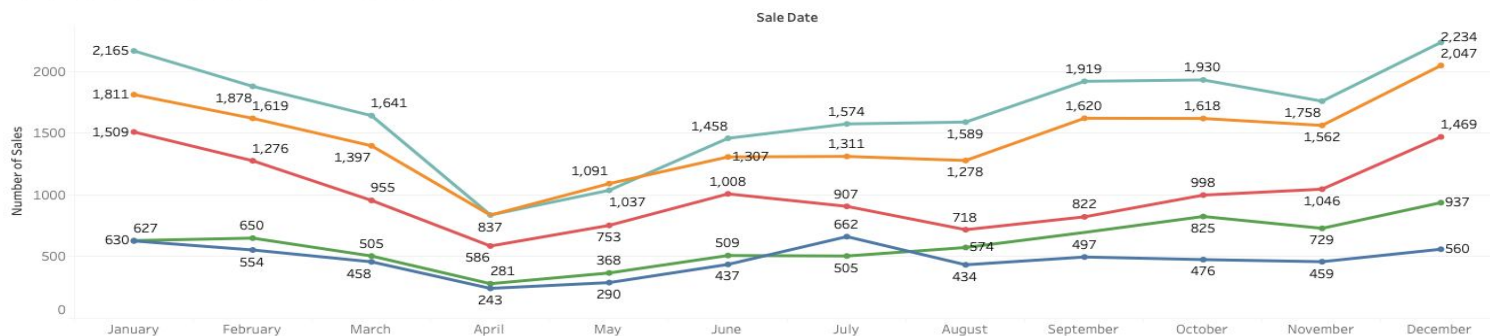


NYC - Sales Report

2019 Number of Sales Vs Time - Residential

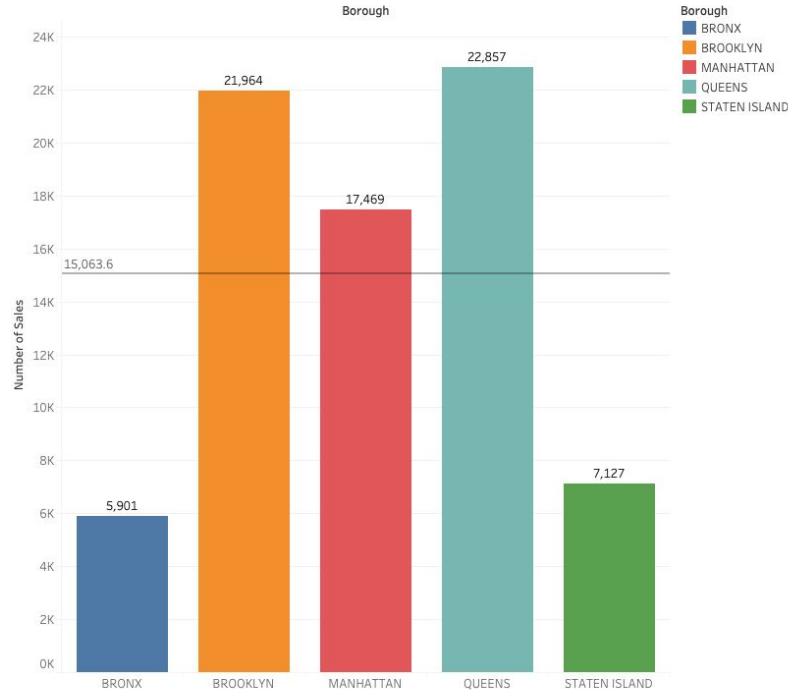


2020 Number of Sales Vs Time - Residential

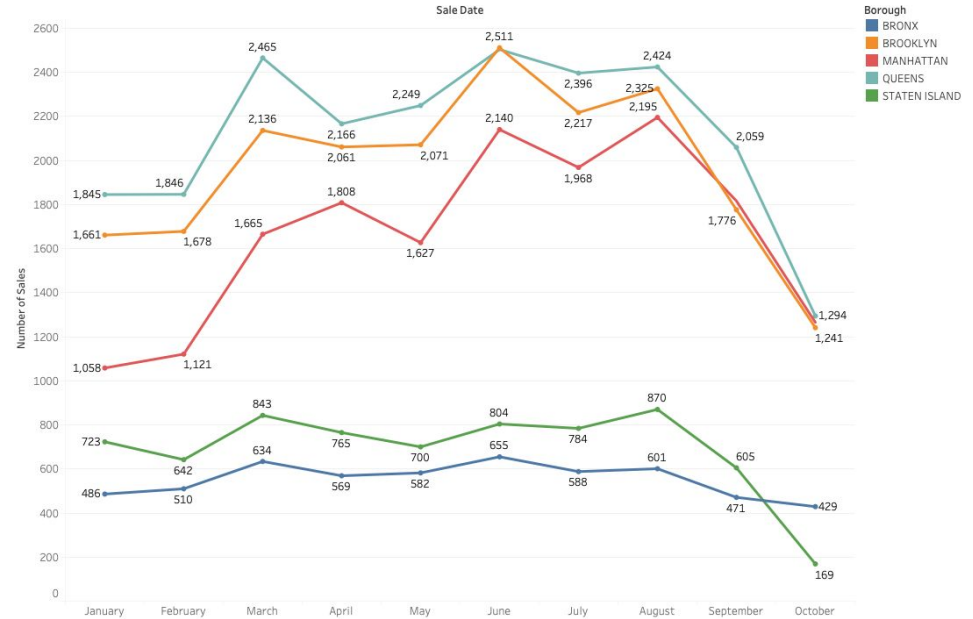


NYC - Sales Report

2021 Sales Per Borough

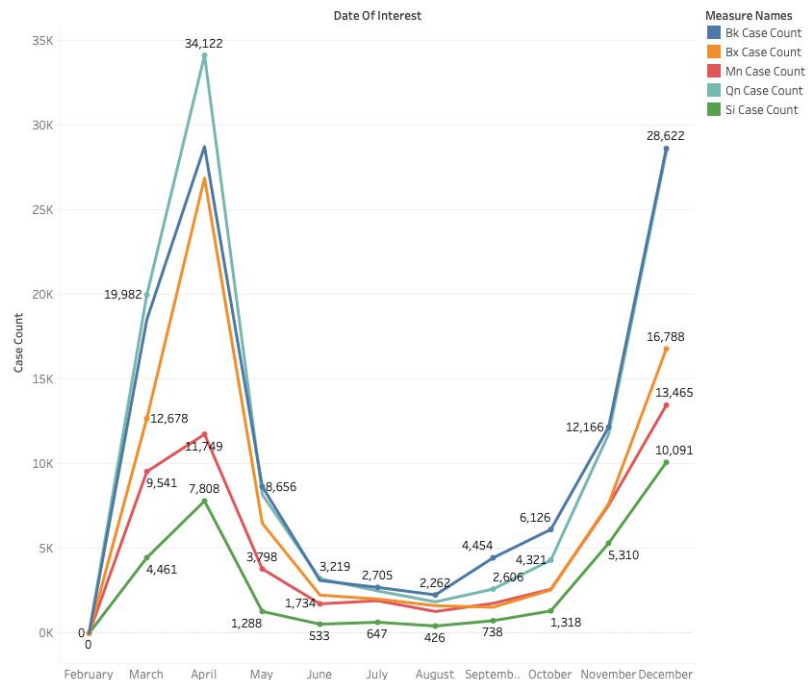


2021 Number of Sales - Residential



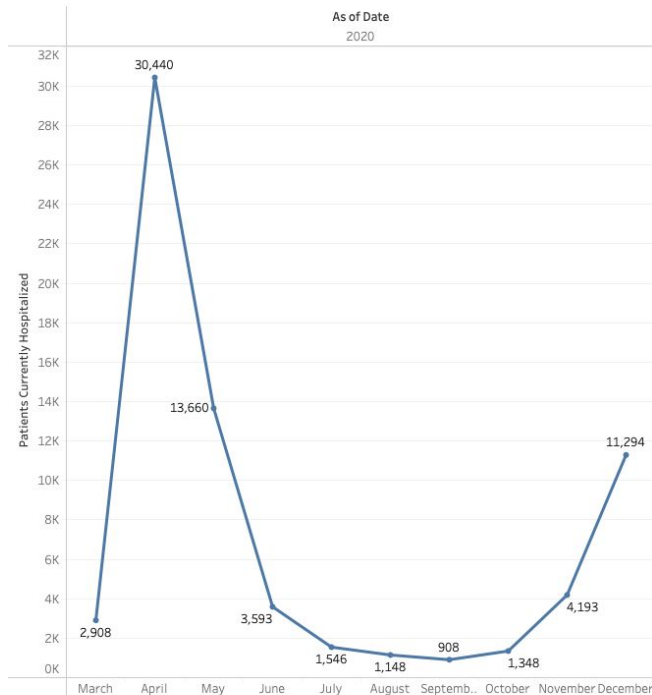
New York State - COVID Report

2020 Covid Case Count Per Borough



The trends of Bk Case Count, Bx Case Count, Mn Case Count, Qn Case Count and Si Case Count for Date Of Interest Month. Color shows details about Bk Case Count, Bx Case Count, Mn Case Count, Qn Case Count and Si Case Count. The data is filtered on Date Of Interest Year, which keeps 2020.

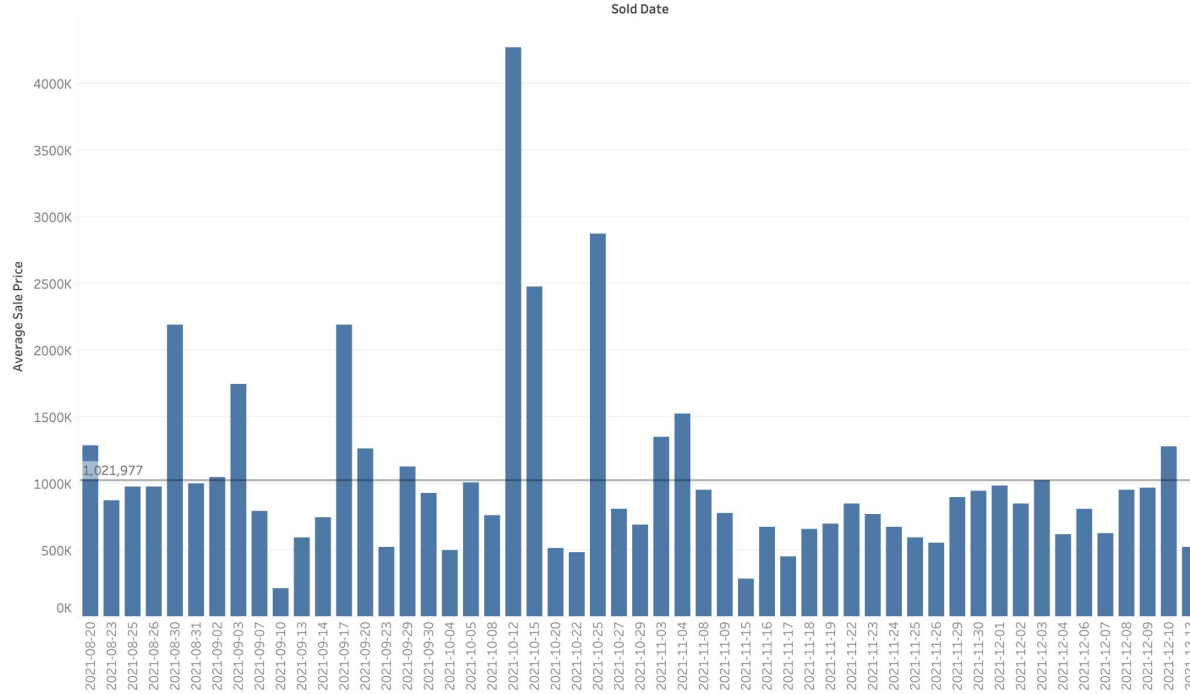
2020 Westchester County COVID Cases



The trend of sum of Patients Currently Hospitalized for As of Date Month broken down by As of Date Year. The data is filtered on Facility County, which keeps WESTCHESTER. The view is filtered on As of Date Year, which keeps 2020.

Westchester County - Sales Report

Westchester County Average Sale Price



Average Sale Price for each Sold Date.

Results - Summary

- In 2020, Manhattan experienced a 25.8% decrease in property sales more than any other borough. However next year, Manhattan bounced back and experienced the greatest increase in property sales by 35.6% more than any other borough.
- In 2020, the number of sales started to decrease drastically from February to June in the residential market with April at the lowest point. In 2021, the number of residential properties sold began to increase and closely match the number of sales from 2019.
- The number of home sales dropped by 17.3% in New York City; however it rose by 10% the following year.
- During the second peak of COVID-19, sale of homes increased higher pre-pandemic levels.

Results - Summary

- Westchester is also experiencing a similar effect with number of sales initially dropping and then increasing by 12.5% in quarter 3 for 2020.
- Value of homes has increased leading to 2021, with average price of \$831,065
- Recently in 2021, the last three months, home values have increased to \$1,012,977

Conclusion

- During most of 2020, the data indicates that the peak rise of COVID-19 influenced the number of sales and the price of sold homes in NYC. However, as we recover from the pandemic, the real estate market has continued to show an erratic behavior no longer attributable to COVID.
- The current levels of home sales in New York City as of October 2021 are behaving very similar to those of the first peak of the pandemic in 2020.
- The number of homes sold has rapidly decreased in the last quarter of 2021, and although the average number of homes sold in 2021 is still higher than in 2020, it is a worrying trend because low levels of home sales may be a consequence of a lack of house supply and, therefore, an imminent increase in prices.
- After analyzing price trends and the amount of recently sold homes in different neighborhoods of New York, we are inclined to believe that this lack of supply of homes is going to lead to a rise in the cost of real estate in New York.
- We also believe that efforts should be directed towards home-building, and not locate so much focus on commercial real estate.

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