NY Housing Prices

NY Housing Hotshots

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Executive Summary

- Problem Statement:
  - Analyze data for New York housing prices in regards to different features focusing on number of bedrooms in the house.
- Data (kaggle):
  - https://www.kaggle.com/datasets/yasserh/housing-prices-dataset
- Hypothesis:
  - Null (H0) hypothesis - As number of bedrooms increases the price of the house will not change.
  - Alternative Hypothesis (H1) - as the number of bedrooms increase the price of the house will have the tendency to increase.
- Results:
  - The null hypothesis is FALSE

Source: nyhousing csv

Problem Statement

We formed the following questions to ask in regards to this data:

1. Does area of house or number of bedrooms matter more to homebuyers?
2. Is a furnished home more preferred than an unfurnished home?
3. Does the main road status matter to homebuyers?
4. Does number of parking spaces have any correlation to housing price?
5. Do New Yorkers prefer houses with basements over guestrooms?
6. Can we predict housing price based on area of the house?
7. Do the number of bathrooms correlate with the number of bedrooms?
8. Do we see a relationship between price and number of stories in a house?
9. Does the total number of rooms (bathroom, bedroom, guestroom, basement) increase home price more than total area?

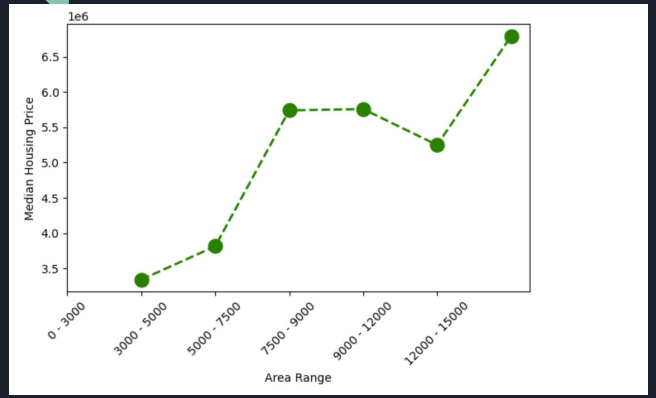
Hypothesis

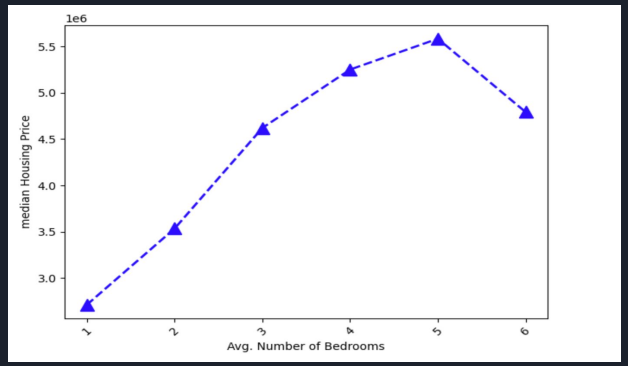
H0 As number of bedrooms increases the price of the house will not change

H1 As the number of bedrooms increase the price of the house will have the tendency to increase

Results We have concluded: the null hypothesis is FALSE

1. Does area of house or number of bedrooms matter more to homebuyers?





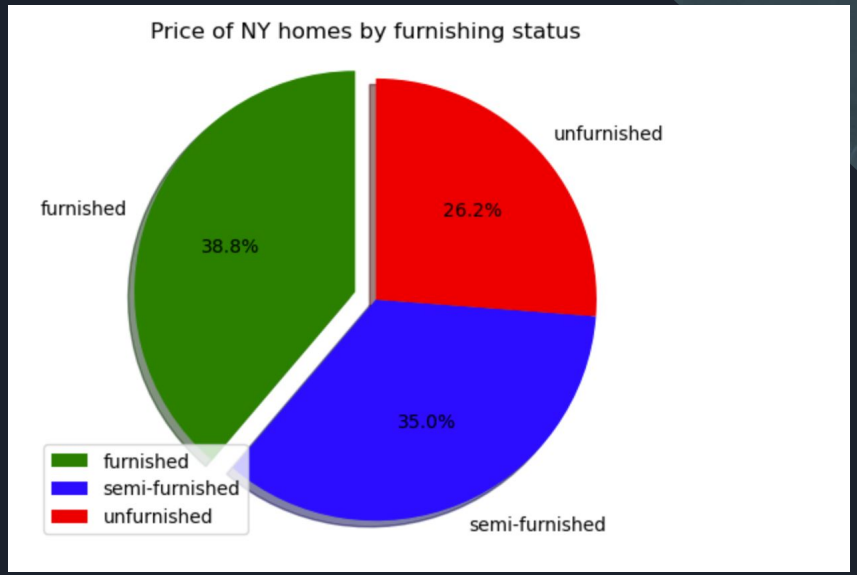
Output suggests that area matters more than bedroom

- Area of the house matters more than the number of bedrooms. Area of the house has upward trend with the increase in area of the house the price increases.
- Where as, with the increase in the # of bedrooms the price drops after a certain point.

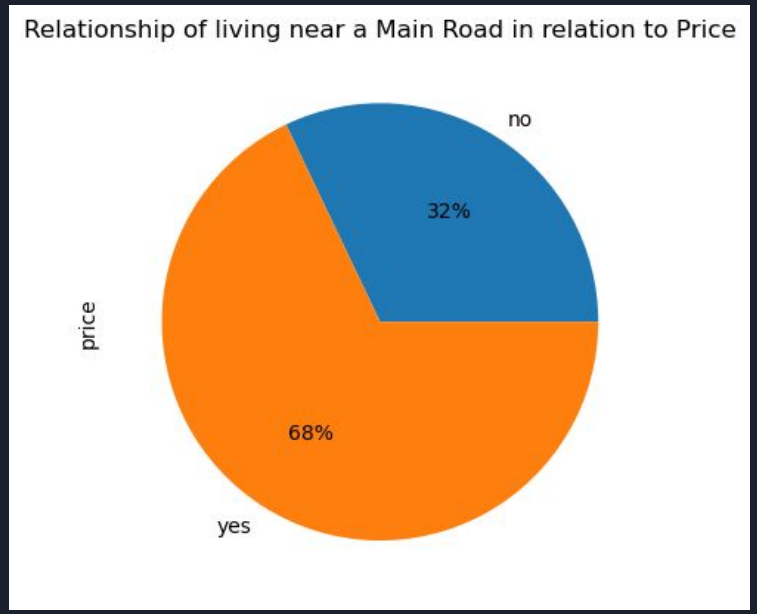
2. Is a furnished home more preferred than an unfurnished home?

New Yorkers are willing to pay more for the furnished homes as opposed to semi or unfurnished home.

- The median price of furnished homes comparing to unfurnished home is 37.8% higher.
- The median price of furnished homes comparing to semi-furnished home is 10.8% higher.



3. Does the main road status matter to homebuyers?



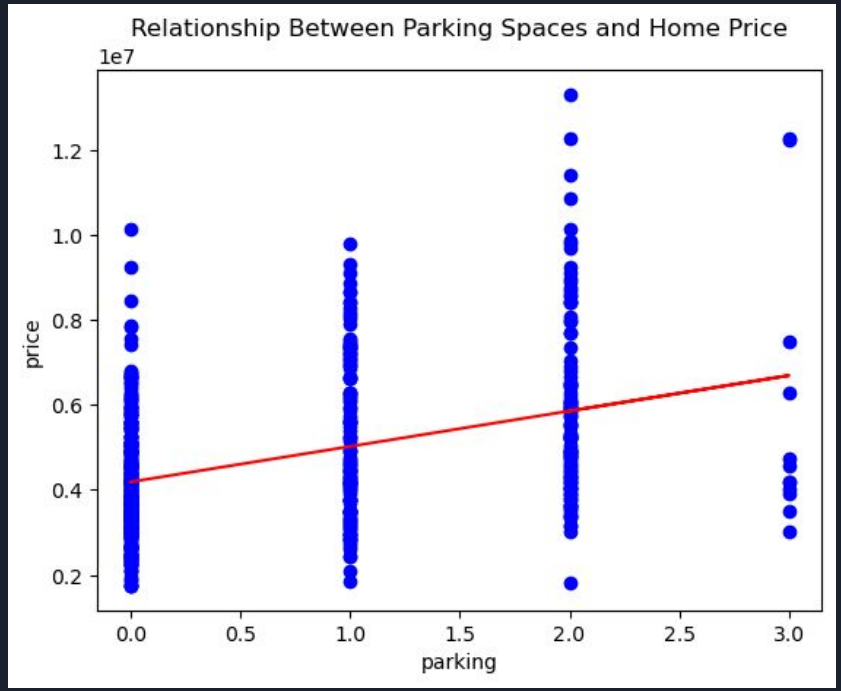
Based on the data gathered, home prices are less similar when close to a main road, as opposed to not being near a main road.

- This can be determined when observing the standard deviation of home prices that are located near a main road or not. The standard deviation of prices for homes near a main road is higher than homes not near a main road.
- This means that the prices are less similar in overall value as opposed to prices of homes not near a main road.

4. Does number of parking spaces have any correlation to housing price?

Generally, the number of parking spaces of a home produces a more saturated cluster of consolidated data.

- When observing the data, as parking spaces for homes increase, the price of homes increases.
- Based on the scatterplot data, an observable trend is that if a home has more than two parking spaces, there is less observable data, but price still has a gradual increase as parking spaces increase.



5. Do New Yorkers prefer houses with basements over guestrooms?

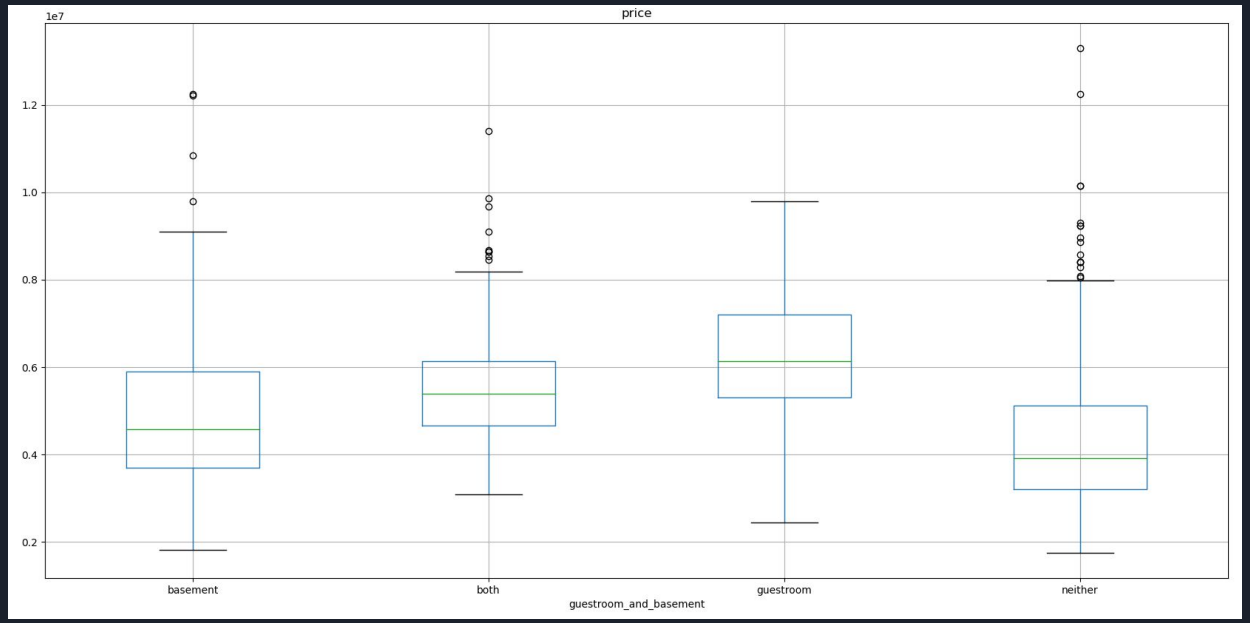
INCONCLUSIVE

Guest rooms are valued more highly by NY homebuyers as reflected by price, however basements are more frequently purchased by NY homebuyers.

5. Do New Yorkers prefer houses with basements over guestrooms? –Inconclusive

New Yorkers show an increased preference towards, guest room, having both a guest room and basement, and having basements over not having either feature (in that order, as demonstrated by housing price as an indicator of feature value).

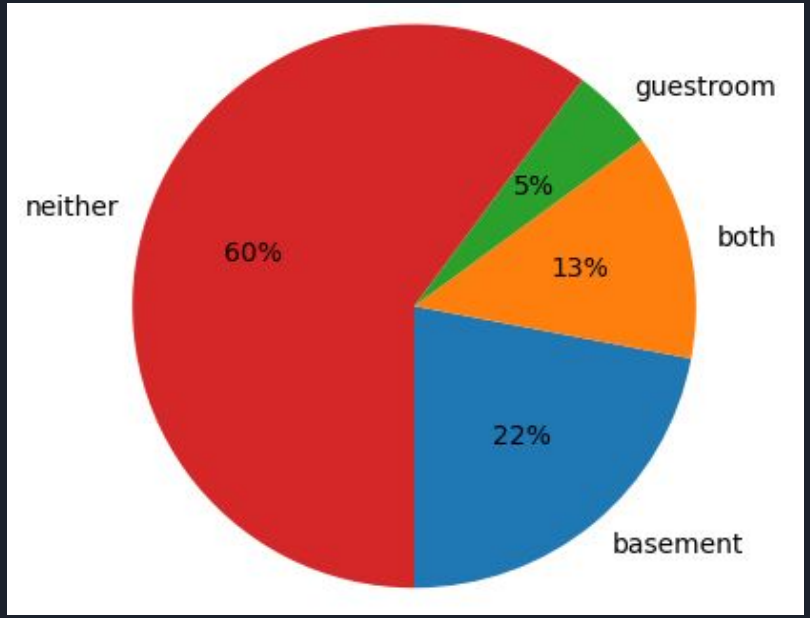
However, this correlation is tenuous.



5. Do New Yorkers prefer houses with basements over guestrooms? –Inconclusive

New Yorkers much more frequently inhabit homes with neither basement nor guest room features than either or both features.

Homes with basements are 3.4 times more frequently inhabited than homes with guest rooms.



6. Can we predict housing price based on area of the house?

NO

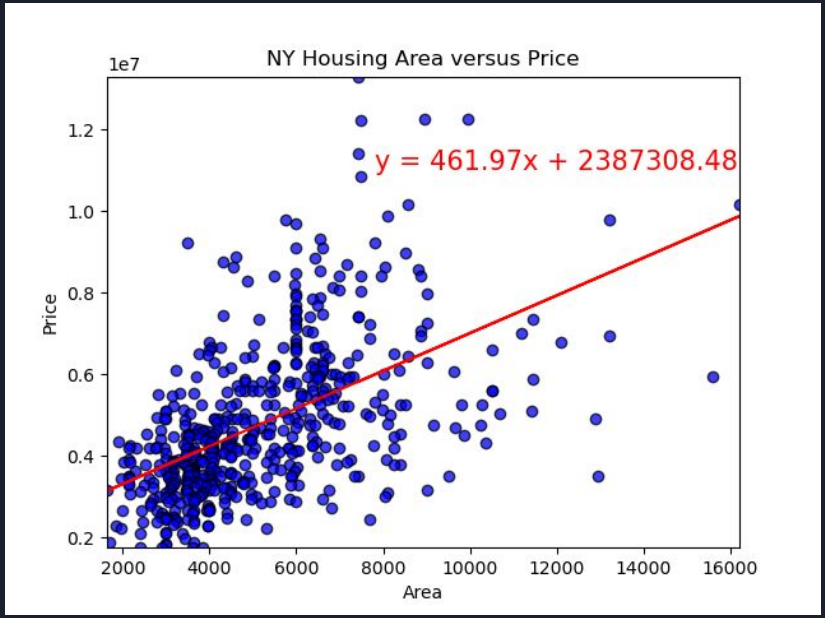
6. Can we predict housing price based on area of the house? –No

The correlation between housing price and area of the house is too slight. r-value of 0.29

A sample housing price predicted an area 30% off from the actual area.

A sample housing area predicted an area 10% off from the actual price.

Although, slightly positively correlated, the margin of error is too large.



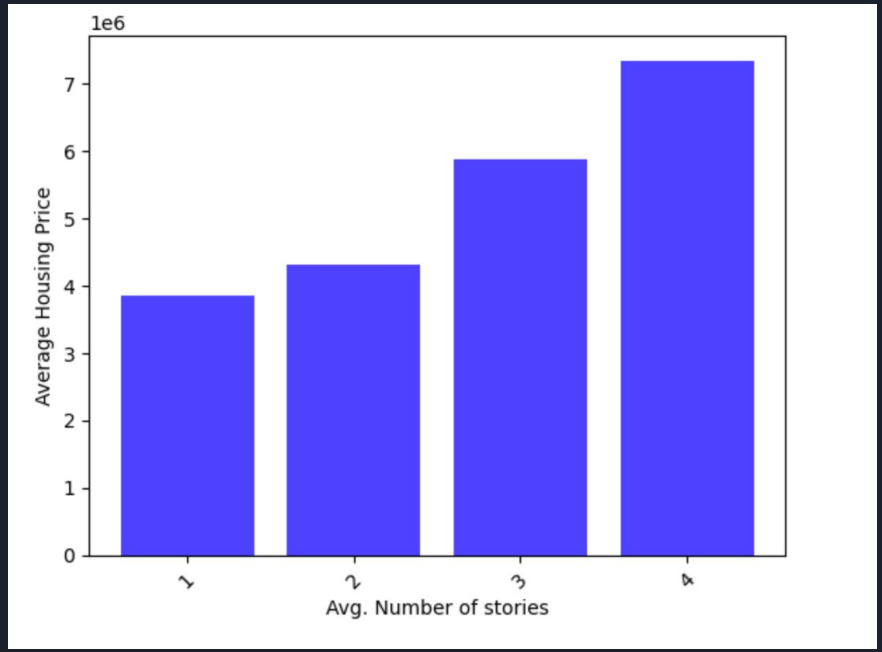
8. Do we see a relationship between price and number of stories in a house? (Yes)

YES

- As the number of stories increase the price of the home increases

/**********/

- We also performed ANOVA test to understand the statistical significance
- With p_value of 2.6832459713031025 × 10-24 there price by stories is not statistically significant



Thank you!

From the

Housing Hotshots!

Appendix

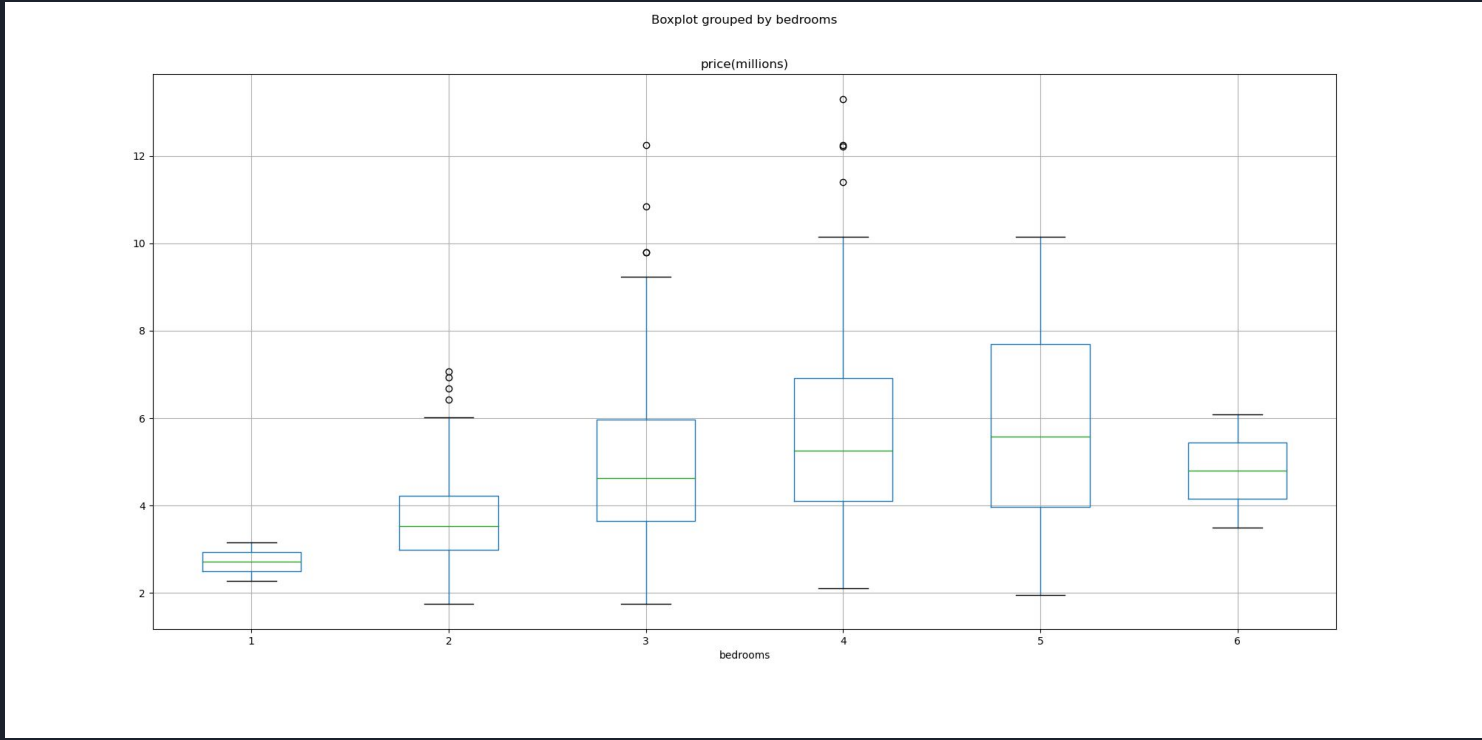
7. Do the number of bathrooms correlate with the number of bedrooms?

NO

The number of bathrooms in a house is more favorable to homebuyers than the number of bedrooms.

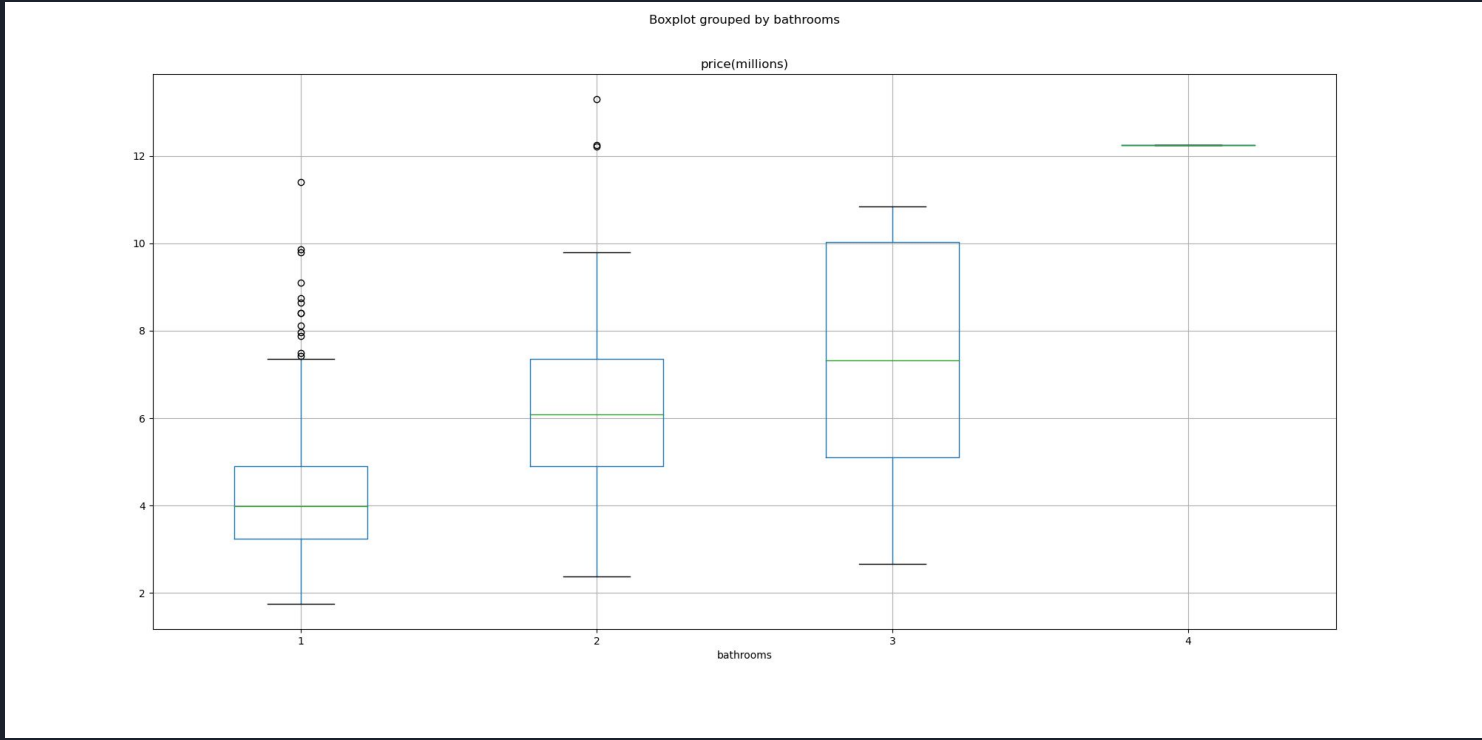
7. Do the number of bathrooms correlate with the number of bedrooms?

The mean house price seemingly increases as number of bedrooms increases until 6 bedrooms per house. But the correlation coefficient indicates this is a slight correlation at best.



7. Do the number of bathrooms correlate with the number of bedrooms?

The mean house price increases as number of bathrooms increases. The correlation coefficient indicates this is a stronger correlation than that of bedrooms.

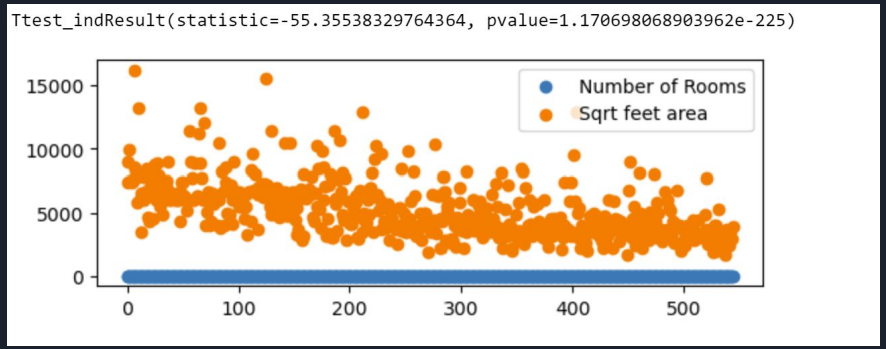


9. Does the total number of rooms (bathroom, bedroom, guestroom, basement) increase home price more than total area?

No!

Measured the price per sqft and price per number of rooms we could not compare the two metrics.

There is no statistical significance between number of rooms and total area with regards to price increase.



NY hotshots also looked at the per capita income of NY in 2022 and NY condo price comparison between March of 2022 and 2023

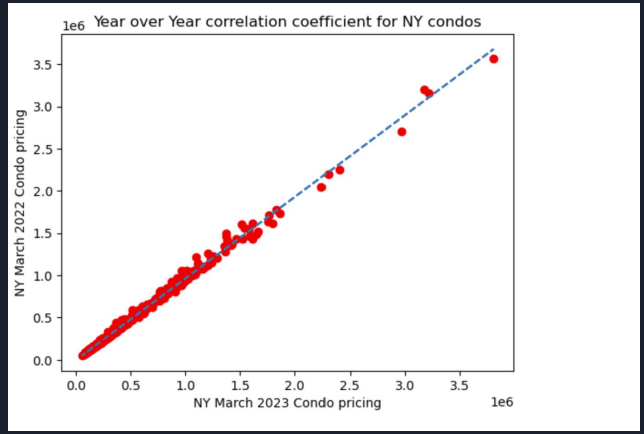
Fred St.Louis API data extraction of per capita by state and Zillow dataset with NY Condo by county monthly price

Per Capita income for New York for 2022 was $78,089

2023 vs. 2022 (YoY) correlation coefficient for NY condos is 1.0

	RegionID	SizeRank	ZIP	StateName	City	CountyName	3/31/2022	3/31/2023
0	62080	3	11368	NY	New York	Queens County	322113.6386	320049.8439
1	62093	5	11385	NY	New York	Queens County	739626.8581	743864.4351
2	62019	7	11208	NY	New York	Kings County	609047.2303	615973.2322
4	61807	15	10467	NY	New York	Bronx County	258710.1760	239929.5746
7	62018	18	11207	NY	New York	Kings County	518031.4312	523839.0165
...	...	...	...	...	...	...	...	...
1560	62754	39809	12791	NY	Youngsville	Sullivan County	212629.2458	242138.4109
1563	63622	39809	14592	NY	York	Livingston County	168398.7431	178124.5799
1564	62755	39809	12792	NY	Yulan	Sullivan County	258810.6806	272556.2253
1565	63437	39809	14134	NY	Chaffee	Erie County	189990.4608	202604.8971
1566	63527	39809	14441	NY	Dresden	Yates County	201630.0796	202295.0495

1264 rows × 8 columns



The NY condo prices stayed steady in 2022 and 2023