



THE WARREN GROUP

ISOM-837

CONSULTING PROJECT

MEET OUR TEAM



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BUSINESS UNDERSTANDING

- High interest rates and house prices are making it harder to buy especially in Massachusetts.
- Many sellers are hesitant to sell at the moment due to potential concern for finding another home and the increasing return on their investment.
- However, Massachusetts still has one of the most valuable housing markets in the country with its high population of college students and large amounts of business, especially near Suffolk and Middlesex counties.
- Our goal is to provide a good analysis on the current housing data in Massachusetts, so that we can give customers the best insights on which properties will give them the best return on their investment.

RESEARCH QUESTIONS

- **WHAT IS THE RELATIONSHIP BETWEEN KEY PROPERTY ATTRIBUTES AND THE SALES PRICE IN THE CURRENT REAL ESTATE MARKET IN THE US?**
- **HOW DOES THE AVAILABILITY OF PARKING AFFECT THE CATEGORIZATION OF CITY TYPES?**

DATA MILESTONES



VARIABLES

- City
- assdvalbld
- propid
- propuse
- assdvaltot
- condition
- year built
- tot rooms
- reno-year
- lotsizesf
- park type
- num park
- Sale type
- AssdvalInd
- Price/Sft
- Price

DATA SETS

- MA Suffolk Properties
- MA Suffolk SalesMtgTrxns

NO.OF OBSERVATIONS: 85000

NO.OF VARIABLES : 16

DATA PREPARATION

INITIALLY, WE HAD 240K RECORDS IN OUR DATA SET, WE SHORTLISTED OUR VARIABLES BASED ON THE VARIABLE WORTH

ELIMINATED DUPLICATE VALUES BY FILTERING THE PROPID VARIABLE

THE TARGET VARIABLE - PRICE - FILTERED THE PROPERTIES WHICH WERE MORE THAN 100K

CREATED A COMPUTED COLUMN NAMED PRICE/SQFT FOR A FAIR COMPARISON

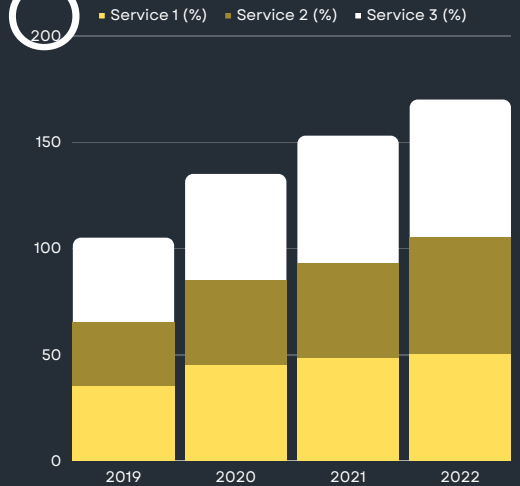
TRANSFORMED SKEWNESS IN OUR DATA FOR A ROBUST ANALYSIS

ELIMINATED VARIABLES WHICH ARE CORRELATED DURING THE VARIABLE FILTERING



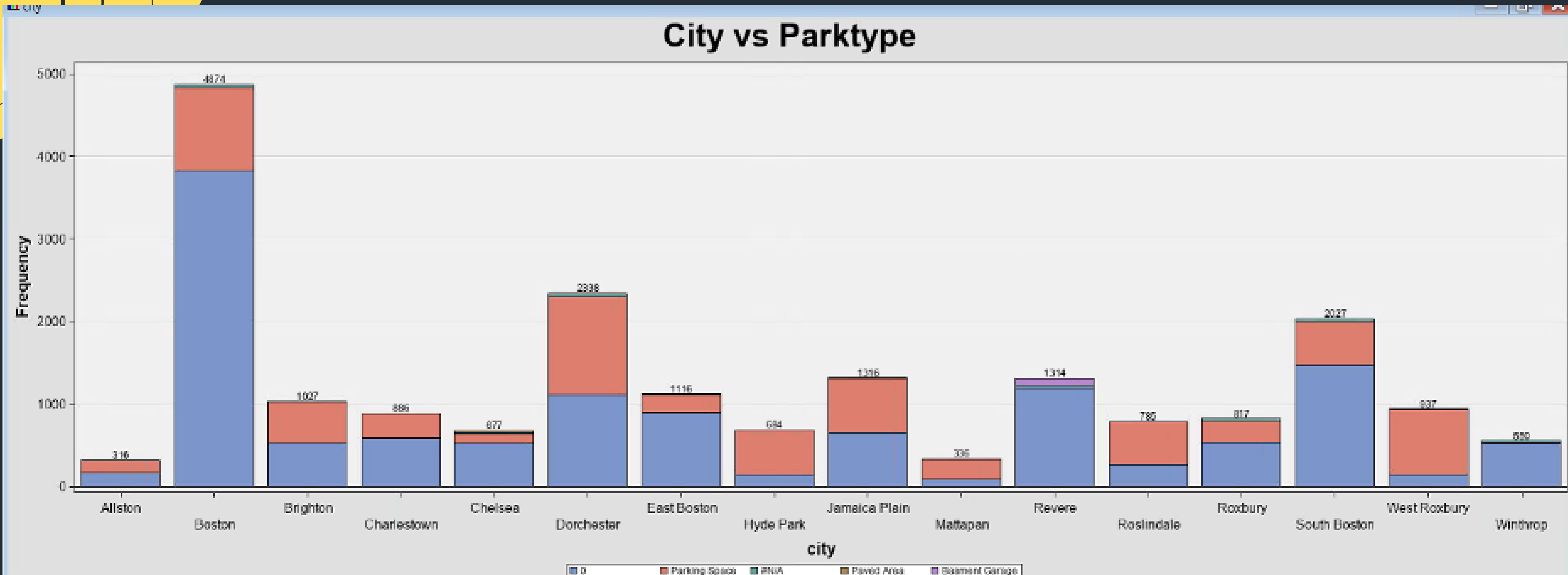
LET'S DIVE INTO

DATA INSIGHTS



- City properties near downtown, like Boston, South Boston, and Dorchester, have higher prices than suburban ones, making them potentially more profitable investment
- Focus on developing condos and apartments in urban areas and single-family and Individual homes in the suburbs for higher profitability
- Prioritize investing in well-conditioned houses to increase sales, as the condition of a property is a key factor in influencing buyers' decisions.
- The parking availability ratio favors suburbs over urban areas, suggesting a higher potential demand for parking spaces in suburban properties.

CITY VS PARK TYPE

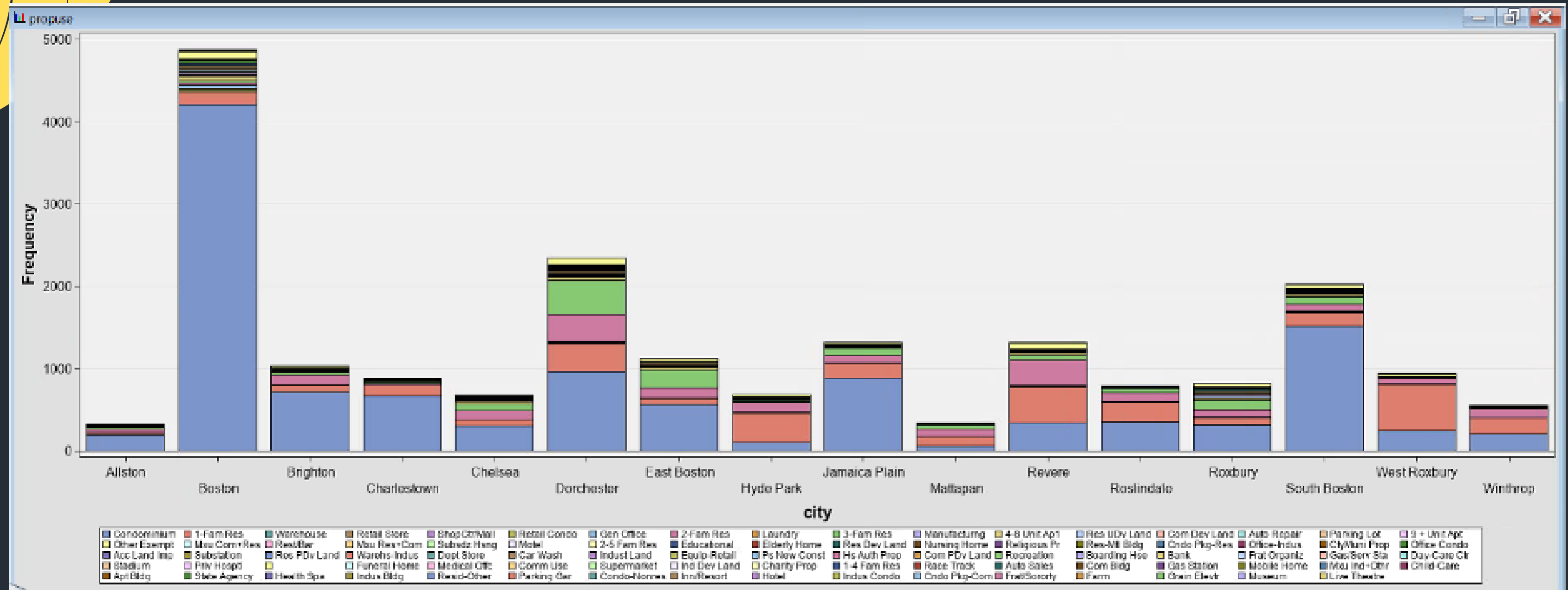


Non-parking Space



Parking space

CITY VS PROPUSE



● condominium

● 1 fam res

● 3 fam res

● 2 fam res

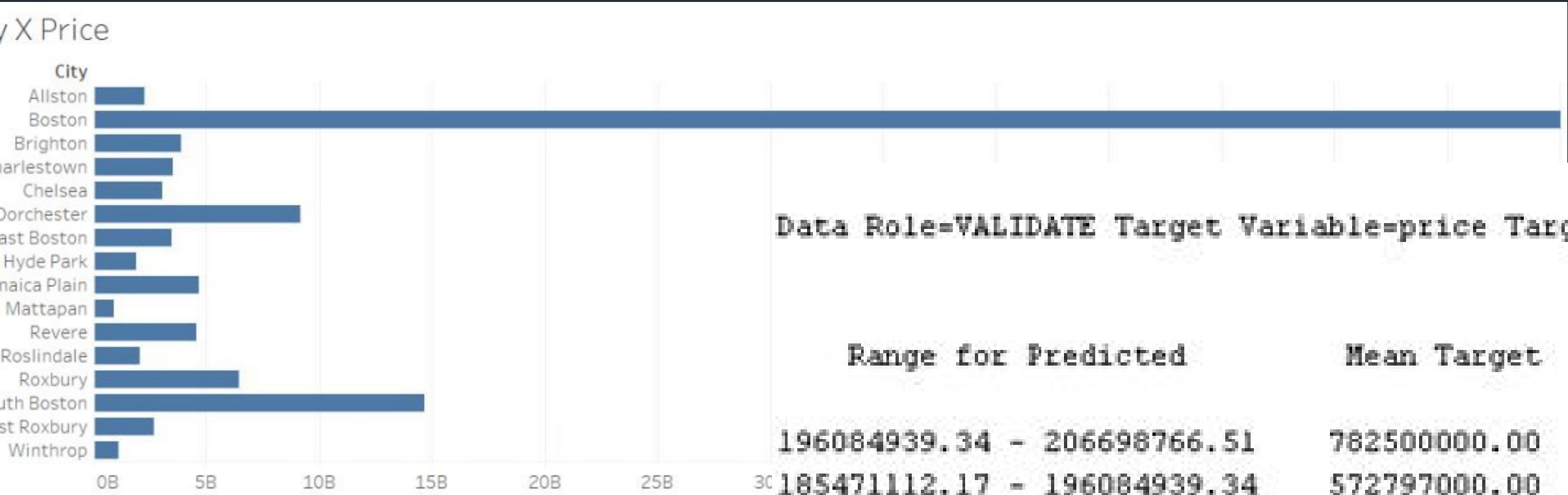
MODEL

COMPARISON

Data	Statistics	Gradient Boosting	Logistic Regression	Decision Tree	Regression	Neural Network
Train:	Average Squared Error	1.06651534E	1.0210457E1	8.2531234	1.0210457E	1.28967544E
Train:	Sum of Squared Errors	6.36560347E	6.0942133E	4.9259592	6.0942133E	7.69755685E

Data	Statistics	Gradient Boosting	Logistic Regression	Decision Tree	Regression	Neural Network
Valid:	Average Squared Error	9.3303892E13	6.3476531E1	5.7054984	6.3476531E	1.1752323E
Valid:	Sum of Squared Errors	2.3867136E18	1.6237297E1	1.4594665	1.627297E	3.0062443E

GRADIENT BOOSTING



Data Role=VALIDATE Target Variable=price Target Label=price

Range for Predicted	Mean Target	Mean Predicted	Number of Observations	Model Score
196084939.34 - 206698766.51	782500000.00	204576155.21	2	201391852.92
185471112.17 - 196084939.34	572797000.00	194316538.15	1	190778025.75
174857284.99 - 185471112.17	610000000.00	181491271.56	1	180164198.58
153629630.65 - 164243457.82	155650000.00	155328618.16	1	158936544.24
143015803.48 - 153629630.65	220250000.00	150419636.33	2	148322717.06
132401976.31 - 143015803.48	71098103.00	134631944.98	2	137708889.89
121788149.14 - 132401976.31	51422930.00	125796490.02	2	127095062.72
111174321.96 - 121788149.14	46268701.75	117607827.66	4	116481235.55
100560494.79 - 111174321.96	74318982.30	104243309.09	10	105867408.38
89946667.620 - 100560494.79	39578764.29	96875427.86	7	95253581.21
79332840.448 - 89946667.620	51421144.75	83566229.69	4	84639754.03
68719013.276 - 79332840.448	78000000.00	74721181.18	12	74025926.86
58105186.104 - 68719013.276	52504096.18	63269109.45	11	63412099.69
47491358.932 - 58105186.104	24016500.00	52487779.61	9	52798272.52
36877531.761 - 47491358.932	34381448.02	41344373.23	46	42184445.35
26263704.589 - 36877531.761	15251991.89	31462322.52	66	31570618.17
15649877.417 - 26263704.589	17969902.79	20005550.04	81	20956791.00
5036050.245 - 15649877.417	6445643.45	7147182.21	1014	10342963.83



SUGGESTIONS



- As a real estate client, consider investing in properties within the 5-15 million range to potentially benefit from promising revenue growth due to their potential to increase in price over time.
- Maximize ROI by considering asset valuation, property usage, and price per square foot, and focus on developing apartments in urban areas and single-family homes in the suburbs for higher profitability.
- Consider investing in suburban properties that offer ample parking space to potentially attract more buyers who prioritize parking availability.

ADDITIONAL:

It is highly recommended to cross-check and verify the entered values in all relevant sheets before finalizing any transaction or price listing.



THANK YOU

FOR YOUR ATTENTION!

