

LANDINGPad Realtors Real Estate Marketing Plan King County

Presented by: Tenicka Norwood



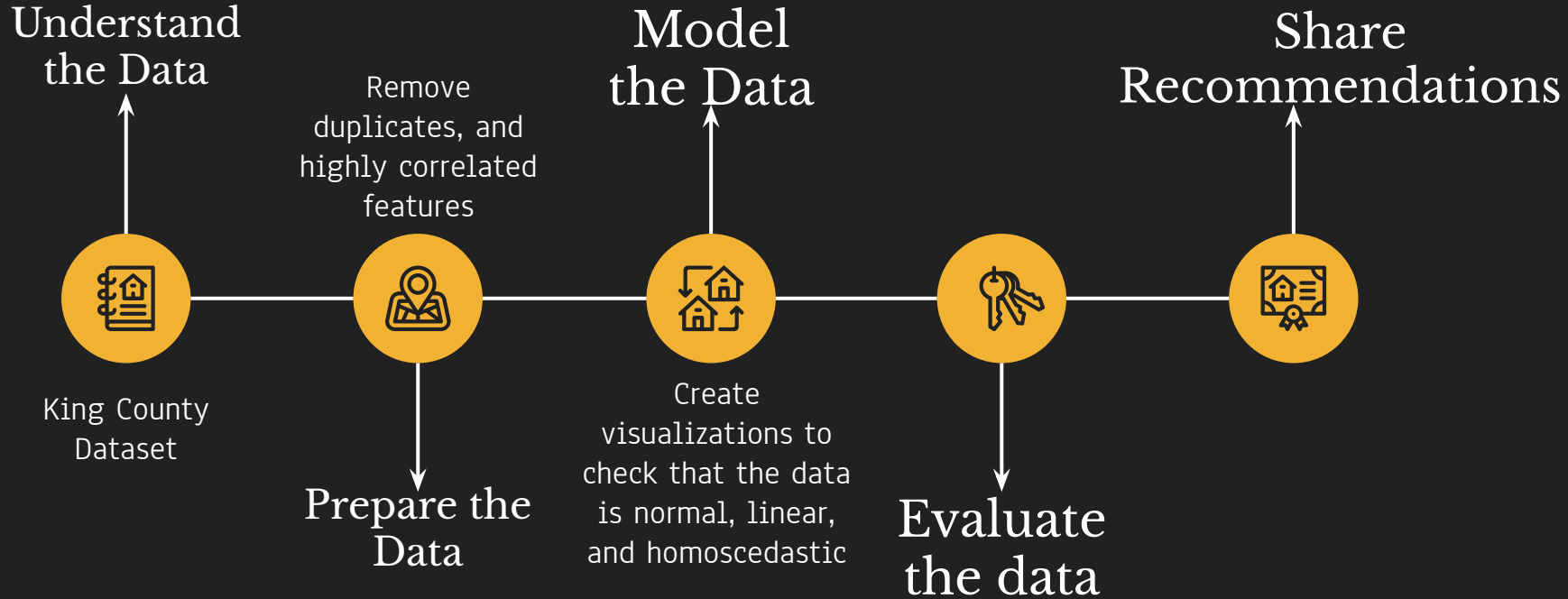



Overview

We want to curate a set of homes for clients based on the following:

- Which neighborhoods have the highest average home price?
- How does the number of bedrooms affect the sale price of a home?
- How does proximity to a highly rated school affect the sale price of a home?

Objectives



The background image is a composite of two interior scenes. The left side, which is darker, shows a dining area with a wooden table, black chairs, and three large, dark, dome-shaped pendant lights hanging from the ceiling. The right side, which is lighter, shows a similar dining area with a wooden table, black chairs with white cushions, and a large window with a view of greenery outside. A small basket of bread sits on the table in the right scene.

"At the turn of the century, the average U.S. home value was \$126,00. Today that figure has seen a 106% increase in just two decades"

—Nick Routley in *Visual Capitalist*

Problem

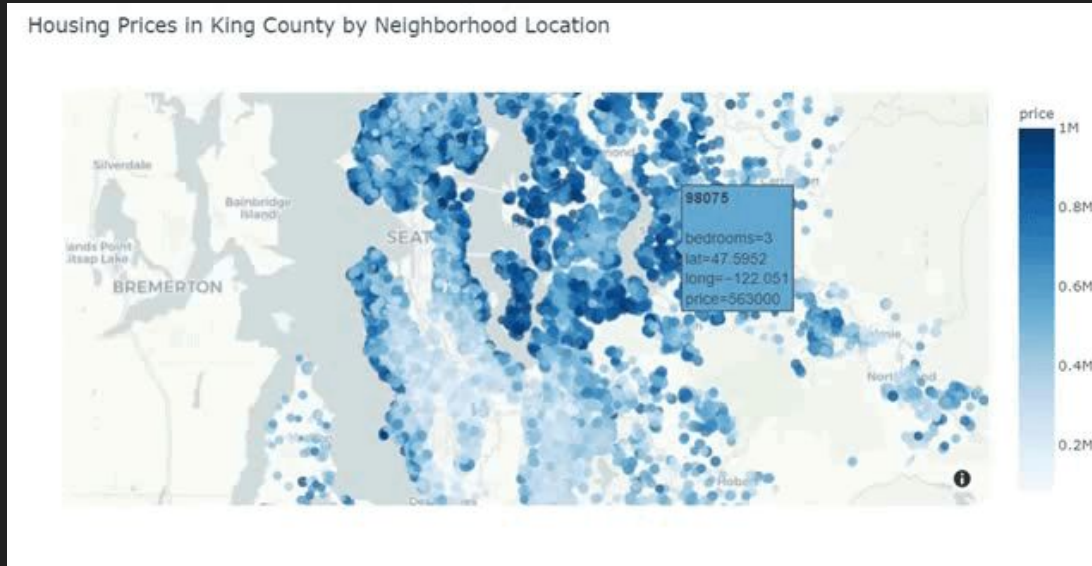
Homeowners want to minimize the purchase price of home while maximizing the proximity to Above Average Schools for their children



Solution

Linear Regression models can help us identify homes that meet buyer criteria based on historical home sale price of homes in King County

Insights: Which neighborhoods have the highest average home price?



Number of Bedrooms vs. Sale Price King County Data

● Sale Prices

Homes with 2, 4, and 5 bedrooms had sale prices above the median and had little to no variance in price

● Median Sale Price

~\$594,000

● Mean Sale Price

~\$467,890

Our Model



OLS Regression Results

Dep. Variable:	price	R-squared:	0.365
Model:	OLS	Adj. R-squared:	0.365
Method:	Least Squares	F-statistic:	1.158e+04
Date:	Sun, 22 Jan 2023	Prob (F-statistic):	0.00
Time:	19:28:30	Log-Likelihood:	-2.6946e+05
No. Observations:	20139	AIC:	5.389e+05
Df Residuals:	20137	BIC:	5.389e+05
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	1.607e+05	3061.929	52.468	0.000	1.55e+05	1.67e+05
sqft_living	157.1496	1.461	107.596	0.000	154.287	160.012

Omnibus:	704.434	Durbin-Watson:	1.961
Prob(Omnibus):	0.000	Jarque-Bera (JB):	780.694
Skew:	0.482	Prob(JB):	2.98e-170
Kurtosis:	2.973	Cond. No.	5.82e+03

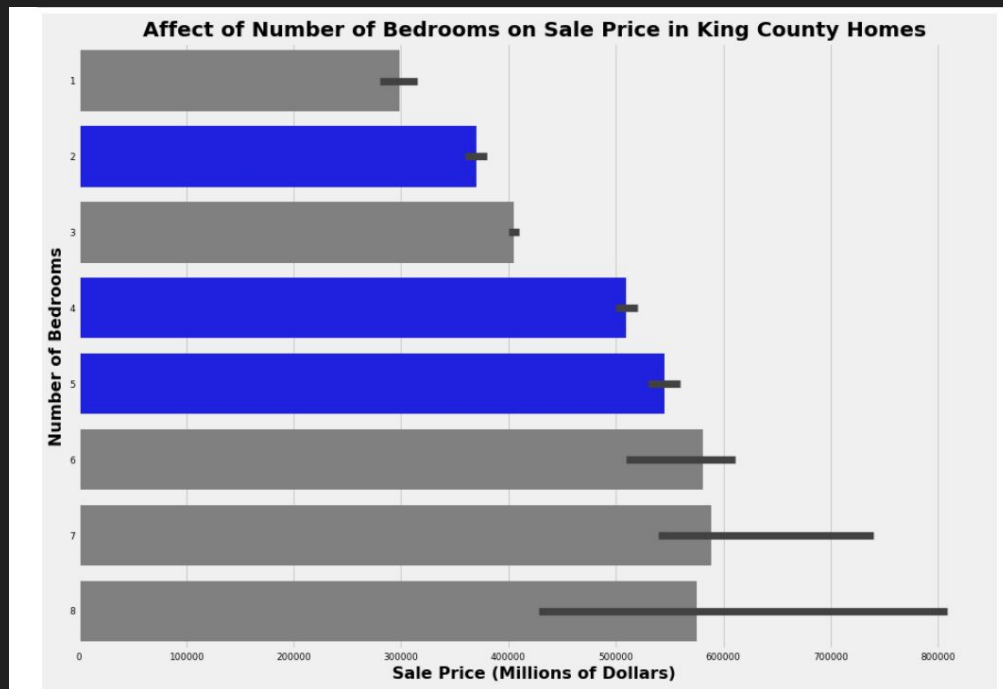
Initially our model used a Simple Linear Regression Model and could explain 36.5% of the variance in sale price in King County dataset.

Our Model

Our revised model used Multiple Linear Regression Model and could explain 81.0% of the variance in sale price in King County dataset.

OLS Regression Results						
Dep. Variable:	price	R-squared:	0.810			
Model:	OLS	Adj. R-squared:	0.809			
Method:	Least Squares	F-statistic:	1274.			
Date:	Sun, 22 Jan 2023	Prob (F-statistic):	0.00			
Time:	20:08:24	Log-Likelihood:	-2.5734e+05			
No. Observations:	20139	AIC:	5.148e+05			
Df Residuals:	20071	BIC:	5.153e+05			
Df Model:	67					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
const	-1.736e+07	1.55e+06	-11.190	0.000	-2.04e+07	-1.43e+07
bedrooms	-1100.0639	864.564	-1.272	0.203	-2794.680	594.553
sqft_living	110.9095	1.395	79.485	0.000	108.174	113.644
lat	3.45e+05	8638.089	39.943	0.000	3.28e+05	3.62e+05
long	-1.065e+04	1.16e+04	-0.920	0.358	-3.33e+04	1.2e+04
view_EXCELLENT	9.417e+04	9003.015	10.460	0.000	7.65e+04	1.12e+05
view_GOOD	2.571e+04	5505.471	4.669	0.000	1.49e+04	3.65e+04
view_NONE	-6.075e+04	2779.500	-21.858	0.000	-6.62e+04	-5.53e+04
zipcode_98004	4.075e+05	7588.574	53.699	0.000	3.93e+05	4.22e+05
zipcode_98005	2.463e+05	7371.820	33.414	0.000	2.32e+05	2.61e+05
zipcode_98006	1.987e+05	4725.756	42.041	0.000	1.89e+05	2.08e+05
zipcode_98007	1.649e+05	7683.570	21.455	0.000	1.5e+05	1.8e+05
zipcode_98008	1.513e+05	5694.763	26.569	0.000	1.4e+05	1.62e+05
zipcode_98010	9.98e+04	9111.519	10.953	0.000	8.19e+04	1.18e+05
zipcode_98019	-3.58e+04	7246.918	-4.940	0.000	-5e+04	-2.16e+04
zipcode_98022	6.779e+04	6769.352	10.014	0.000	5.45e+04	8.11e+04
zipcode_98023	-1.83e+04	4495.090	-4.071	0.000	-2.71e+04	-9490.531
zipcode_98024	9.049e+04	1.08e+04	8.397	0.000	6.94e+04	1.12e+05
zipcode_98027	1.297e+05	4906.830	26.437	0.000	1.2e+05	1.39e+05
zipcode_98029	1.443e+05	5598.263	25.779	0.000	1.33e+05	1.55e+05
zipcode_98033	1.932e+05	5219.876	37.007	0.000	1.83e+05	2.03e+05
zipcode_98034	4.701e+04	4654.291	10.101	0.000	3.79e+04	5.61e+04
zipcode_98038	2.925e+04	4376.620	6.682	0.000	2.07e+04	3.78e+04
zipcode_98039	5.598e+05	3.51e+04	15.936	0.000	4.91e+05	6.29e+05
zipcode_98040	3.479e+05	7302.947	47.638	0.000	3.34e+05	3.62e+05
zipcode_98045	6.236e+04	7893.578	7.900	0.000	4.69e+04	7.78e+04
zipcode_98052	1.361e+05	4407.164	30.880	0.000	1.27e+05	1.45e+05
zipcode_98053	1.245e+05	5343.599	23.295	0.000	1.14e+05	1.35e+05
zipcode_98056	3.89e+04	4518.904	8.609	0.000	3e+04	4.78e+04
zipcode_98059	5.175e+04	4361.658	11.864	0.000	4.32e+04	6.03e+04
zipcode_98065	6.351e+04	6434.366	9.870	0.000	5.09e+04	7.61e+04
zipcode_98072	3.898e+04	6071.862	6.421	0.000	2.71e+04	5.09e+04
zipcode_98074	1.155e+05	4954.809	23.307	0.000	1.06e+05	1.25e+05
zipcode_98075	1.573e+05	5560.670	28.293	0.000	1.46e+05	1.68e+05
zipcode_98102	2.692e+05	9928.257	27.119	0.000	2.5e+05	2.89e+05
zipcode_98103	1.877e+05	4731.373	39.666	0.000	1.78e+05	1.97e+05

Insights: How does the number of bedrooms affect the sale price of a home?



Number of Bedrooms vs. Sale Price King County Data

● Sale Prices

Homes with 2, 4, and 5 bedrooms had sale prices above the median and had little to no variance in price

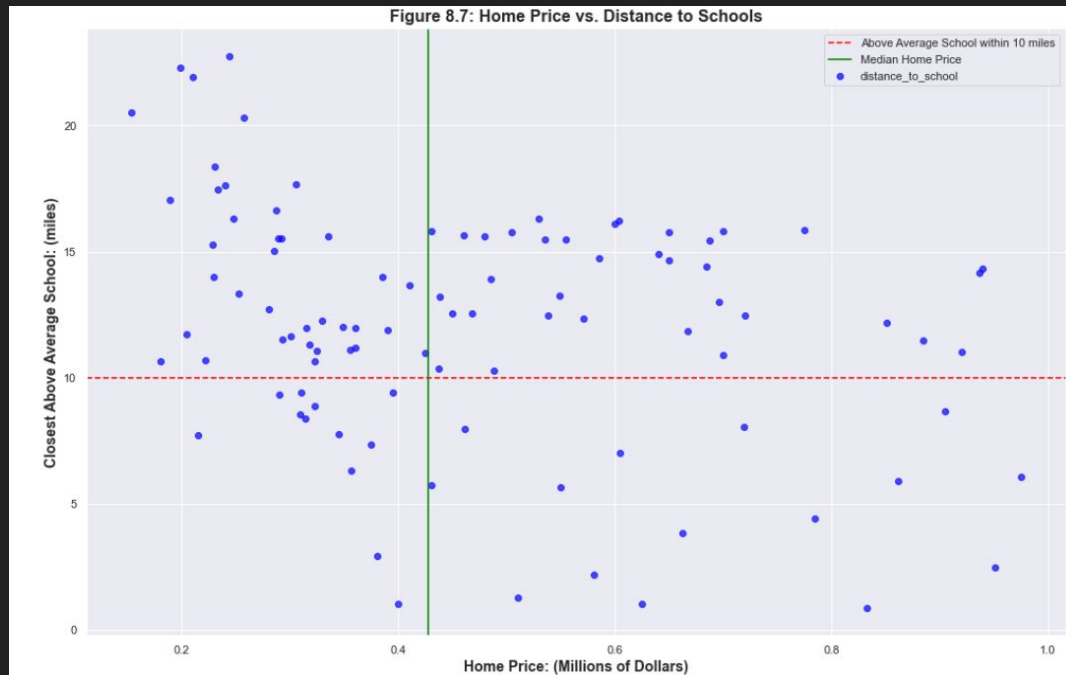
● Median Sale Price

~\$594,000

● Mean Sale Price

~\$467,890

Insights: How does proximity to a highly rated school affect the sale price of a home?



Home Price vs. Distance to Schools King County Data

● Sale Prices

Homes with 2, 4, and 5 bedrooms had sale prices above the median and had little to no variance in price

● Median Sale Price

~\$594,000

● Mean Sale Price

~\$467,890

Insights: How does proximity to a highly rated school affect the sale price of a home?

		Total students enrolled	rating_score	school_id
Grades	School			
6-8	Beaver Lake Middle School	852.00	7	16.00
	Issaquah Middle School	988.00	7	15.00
	Pacific Cascade Middle School	1000.00	7	8.00
	Pine Lake Middle School	943.00	8	11.00
9-12	Issaquah High School	2417.00	8	6.50
	Skyline High School	2169.00	10	4.00
K-5	Cascade Ridge Elementary School	487.00	8	8.00
	Creekside Elementary School	723.00	8	9.00
	Endeavour Elementary School	598.00	8	12.00
	Fall City Elementary School	544.00	8	7.00
	Grand Ridge Elementary School	747.00	7	7.00
	Sunny Hills Elementary School	732.00	9	5.00
PK-5	Discovery Elementary School	686.00	9	6.00

Home Price vs. Distance to Schools King County Data

● School Ratings

Highly rated schools were chosen
As those with great school rating
scores of 7 or higher out of 10.

● Top Elementary School

Discovery ES

● Top High School

Skyline HS

Recommendations



Number of Bedrooms

Mercury is the closest planet to the Sun

2-5



Neighborhoods

High: Clyde Hill
Mid: Fremont, Queen Anne, Wallingford
Low: Allentown
Lakeland

476K



Proximity

Homes that are within 10 miles of an Above Average school start around 476 K

800K

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Future Work

Explore the effect of distance to local attractions:

- Parks
- third places
- places of worship

on sale price in the King County dataset.

Thank you!

Repo at:

https://github.com/dataeducator/real_estate_linear_regression/blob/main/final_project_phase_2.ipynb



Data:

- [King County](#)
- [Greatschools](#)

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