

MURAT KURT

EDA-PROJECT SPICED

To stay sharp-eyed, even when the data piles up!



CLIENT-REQUIREMENTS

AMY WILLIAMS

- INTERESTED IN PURCHASING PROPERTIES IN A PERIPHERAL LOCATION
- PREFERS TO AVOID ANY INTERACTION WITH FBI
- OWNS PRIME-LOCATION PROPERTIES



HYPOTHESIS (1)

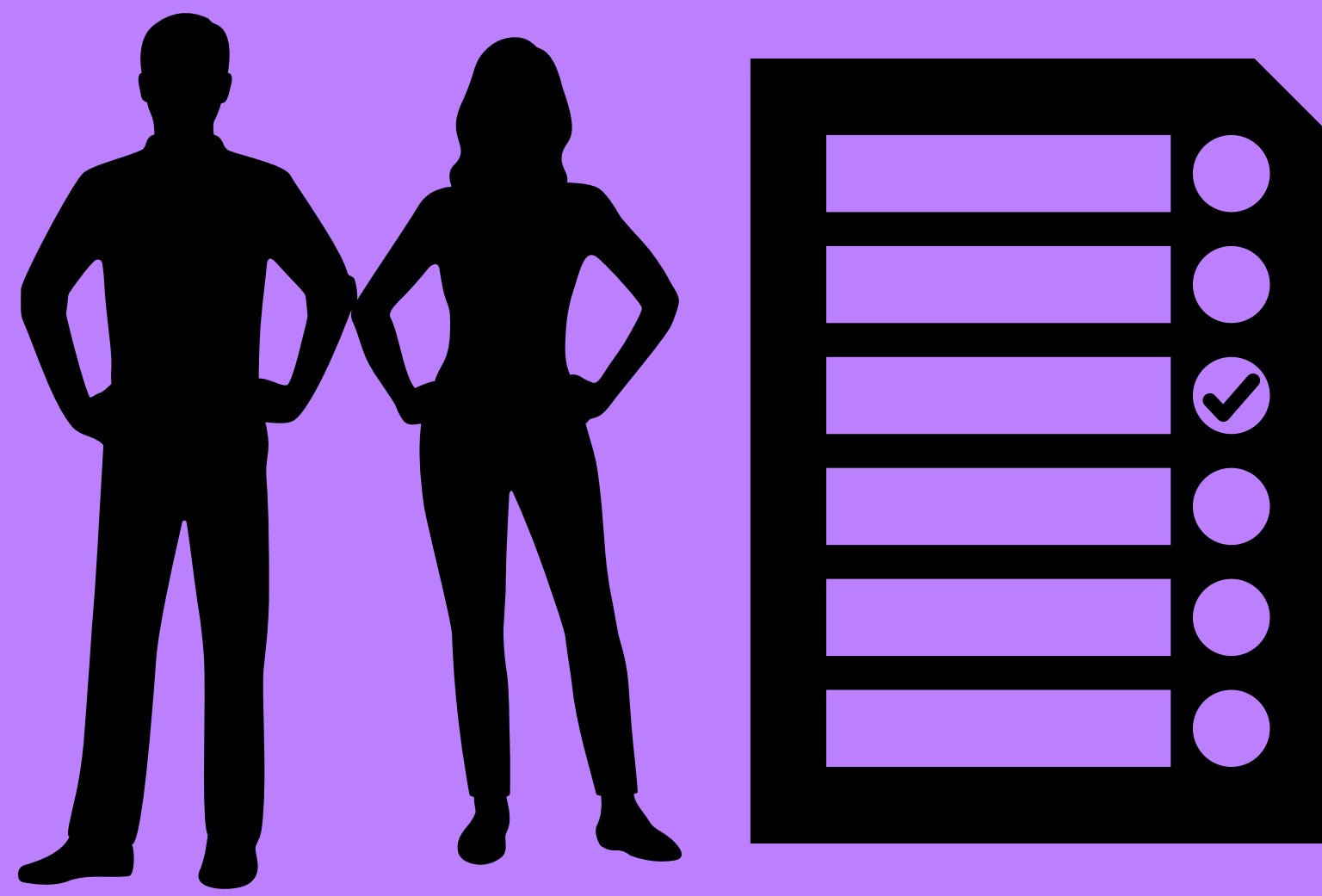
THE PRICE DEPENDS ON THE DISTANCE TO THE CENTER-COORDINATES OF SEATTLE, WASHINGTON (DOWN-TOWN)



AMY WILLIAMS IS VISITING MY OFFICE IN SEATTLE, DOWN-TOWN,
BEST LOCATION OF COURSE...

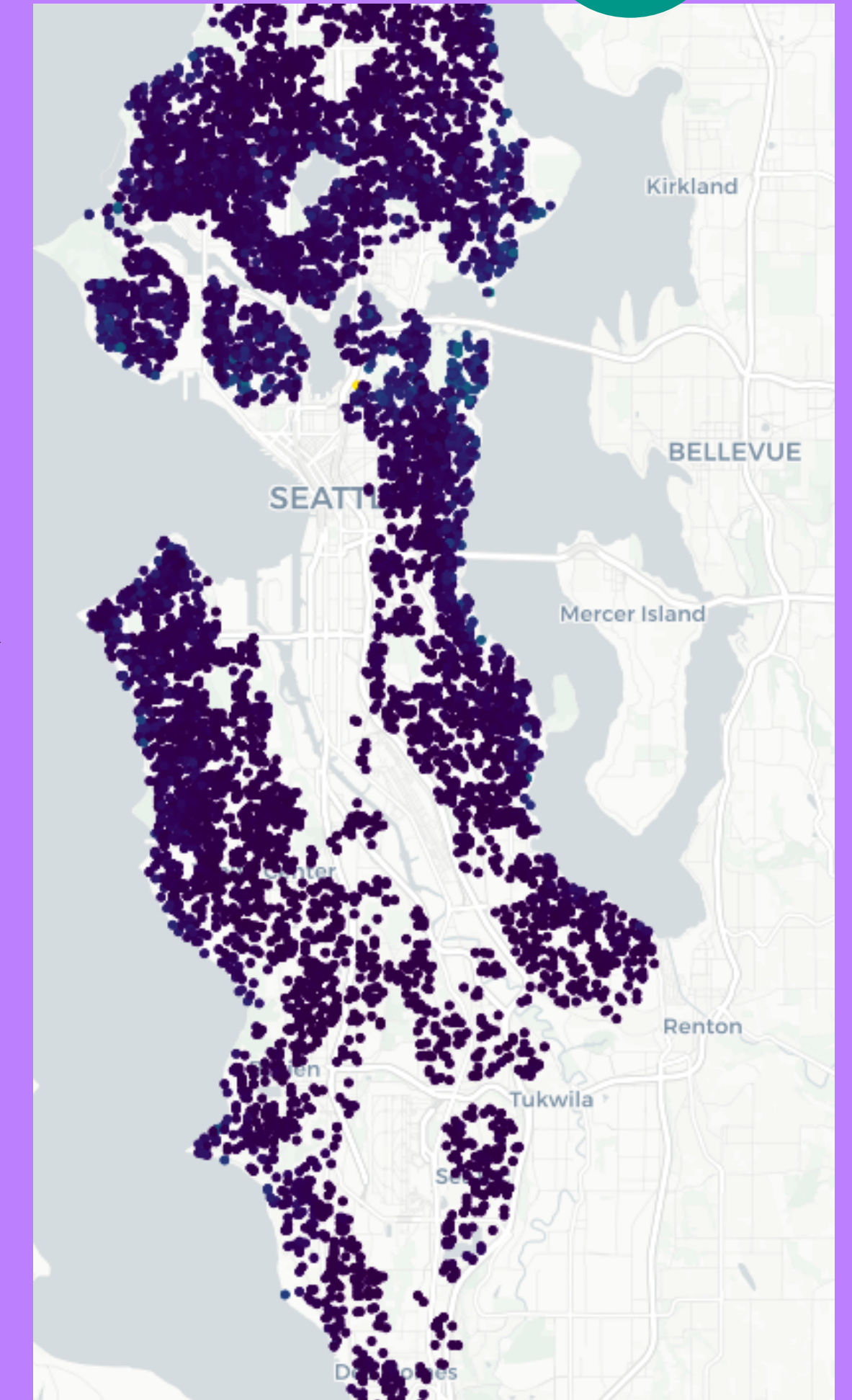
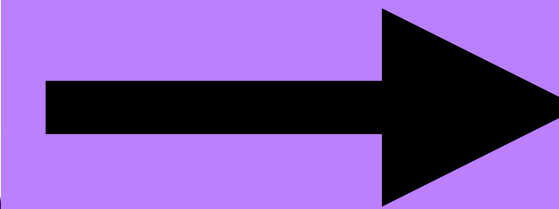
HYPOTHESIS (1)

THE PRICE DEPENDS ON THE DISTANCE TO THE CENTER-COORDINATES OF SEATTLE, WASHINGTON (DOWN-TOWN)

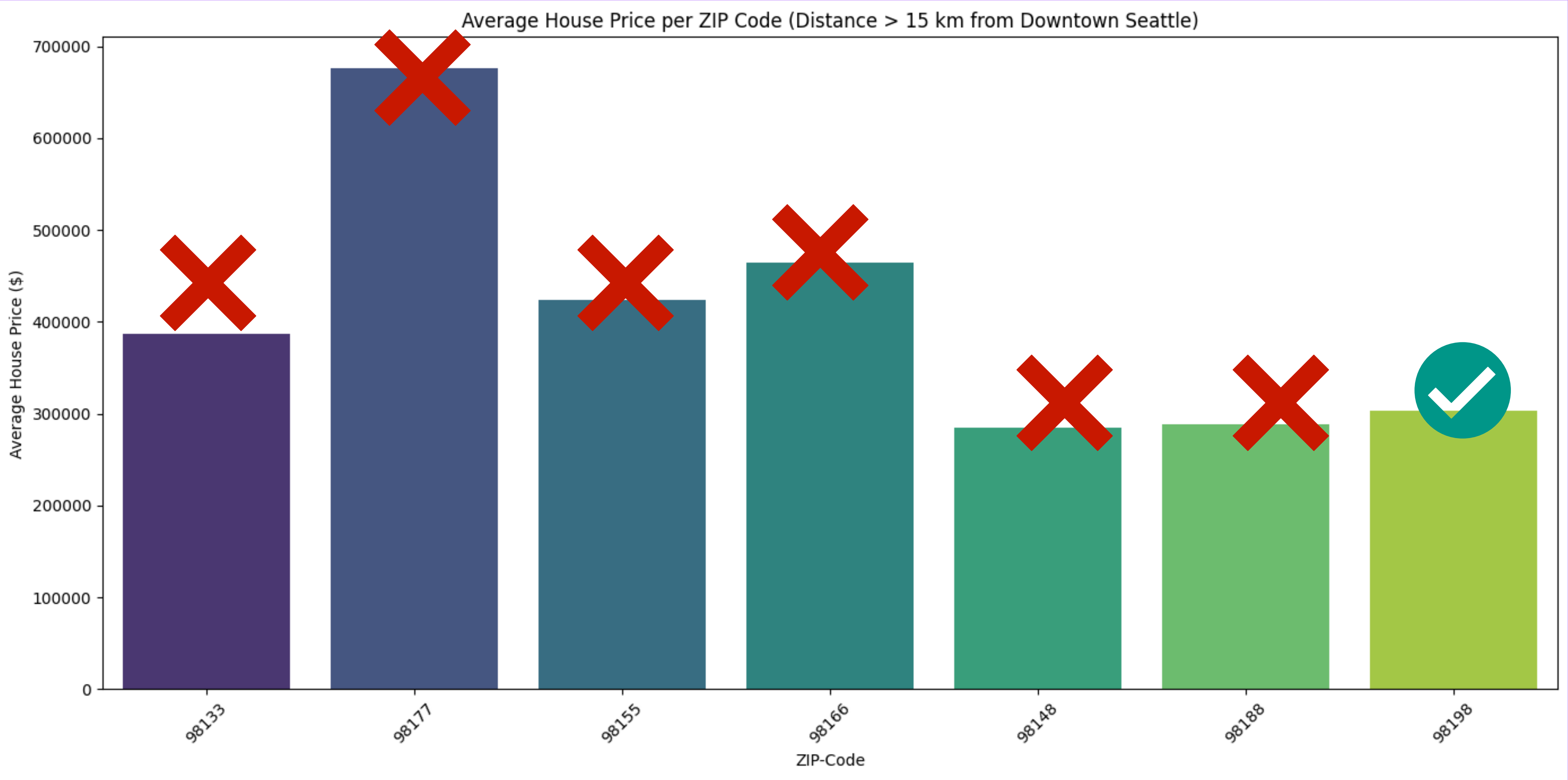


WHERE AND HOW TO HIDE
TIPS FOR PROPERTY SEARCH
CHECKING HER TOP-RATED PROPERTIES

PERIPHAL DEFINITION (OUTSIDE CITY YES/NO)

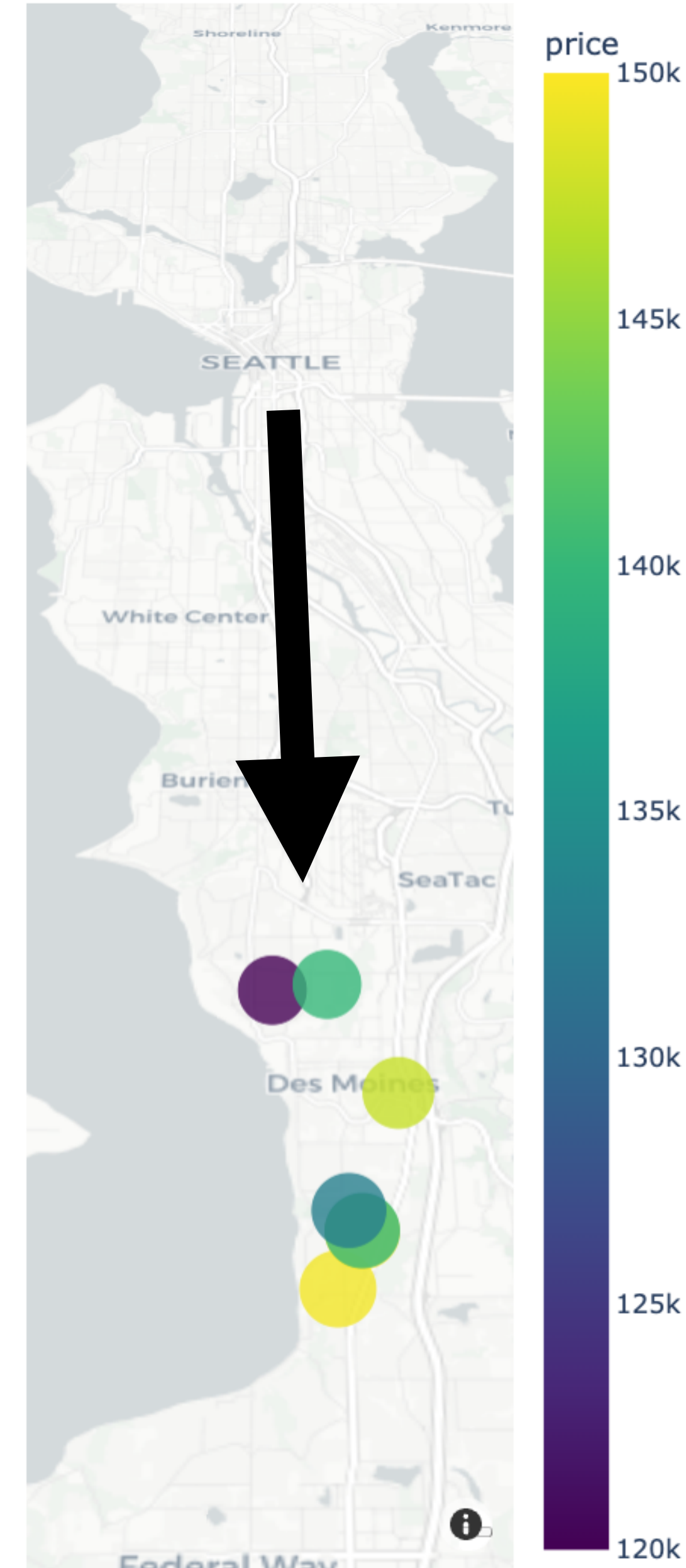


PERIPHERAL DEFINITION > 15 KM (SEARCH FARTHEST LOCATION)

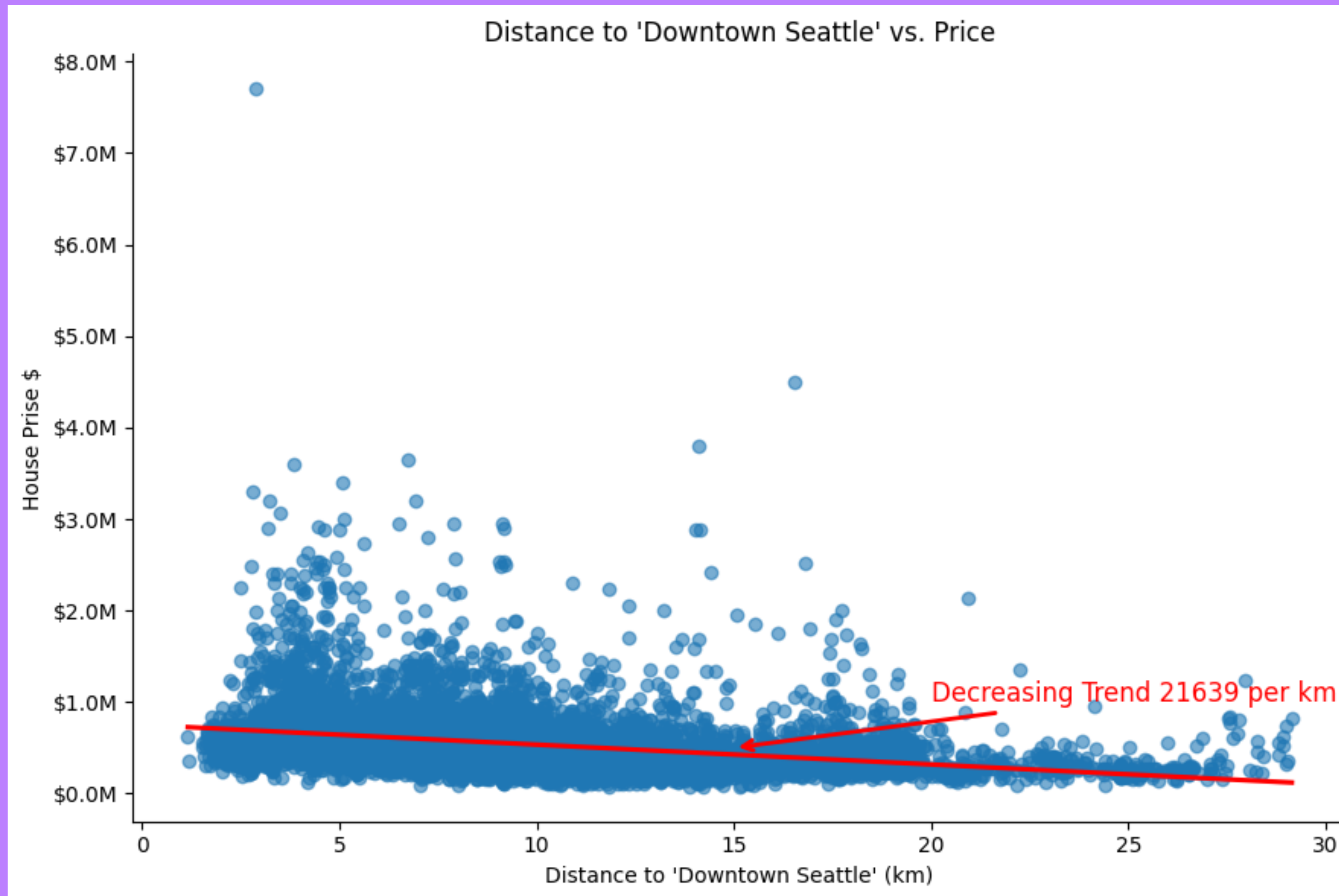


PERIPHAL PROPERTY OPPORTUNITY

- **ADDITIONAL CONDITION ZIP=98198 AND BEDROOM COUNT > 2**
- **PROPERTY IS FAR AWAY FROM DOWN-TOWN**
- **PROPERTY IS WITHIN SEATTLE CITY**



HOW BELIEVE VISUALLY



HOW BELIEVE ARGUMENTATIVE

NULL-HYPOTHESIS: THERE IS NO STATISTICALLY SIGNIFICANT BETWEEN PRICE AND DISTANCE
→ $SLOPE = 0$

ALTERNATIVE -HYPOTHESIS: THERE IS A STATISTICALLY SIGNIFICANT BETWEEN PRICE AND DISTANCE)
→ $SLOPE \neq 0$

SLOPE: -21639 \$ FOR EVERY ADDITIONAL KM

P-VALUE ($SLOPE < 0$): 0.000

CHECK WITH ONE-TAIL METHOD:

SLOPE: -21639 \$ FOR EVERY ADDITIONAL KM

P-VALUE ($SLOPE < 0$): 0.000

SINCE THE ESTIMATED SLOPE IS **NEGATIVE** AND THE P-VALUE IS PRACTICALLY ZERO, THE NULL-HT CAN REJECTED
→ ALTERNATIVE-HT IS VALID

HYPOTHESIS (2)

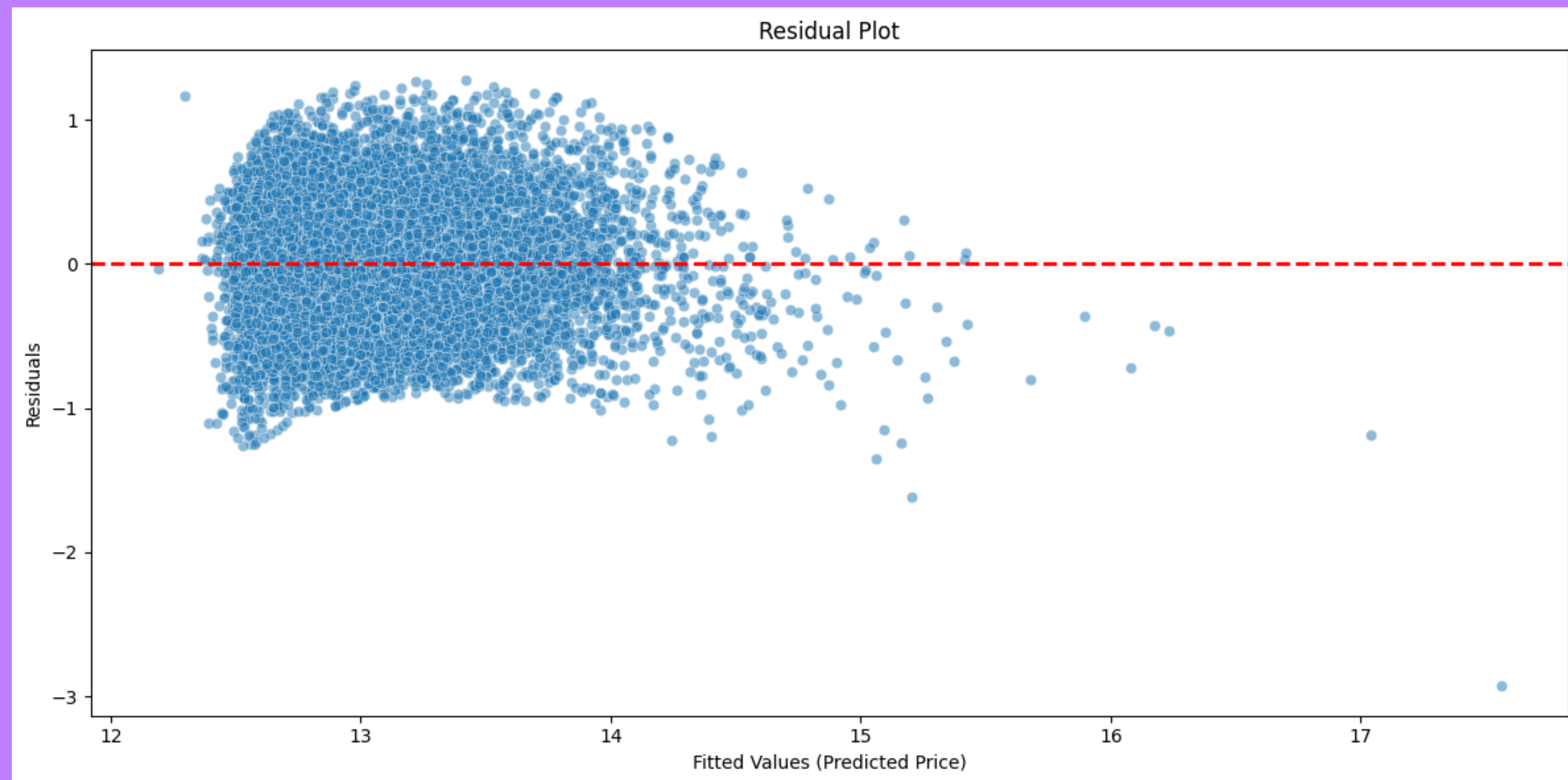
BOTH, LIVING SPACE AND LOT ARE SIGNIFICANT FOR PRICE

PRICE -> LOG(PRICE)

—> $\text{LOG}(\$ 50000000) = 7.67$

—> $\text{LOG}(\$ 50000) = 4.67$

—> AVOIDING EFFECT OF OUTLINERS



HYPOTHESIS (2) CONCLUSION

SOFT LIVING:

SLOPE/COEF > 0 AND P = 0

—> A SIGNIFICANT POSITIVE EFFECT CAN BE DETECTED

SOFT LOT:

SLOP/COEF < 0 AND P = 0

—> A SMALL NEGATIVE EFFECT CAN BE DETECTED

—> LOT SIZE ARE NOT SO SIGNIFICANT,
BECAUSE THE LOT SIZES ARE
GENERALLY MORE OR LESS SAME

AMY SHOULD CONCENTRATE MORE ON THE SQUARE FOOTAGE DETAILS :-)

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OLS Regression Results

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Dep. Variable:          log_price    R-squared:                0.484
Model:                  OLS         Adj. R-squared:           0.484
Method:                 Least Squares   F-statistic:            1.012e+04
Date:                   Do, 10 Jul 2025   Prob (F-statistic):      0.00
Time:                   17:33:44        Log-Likelihood:         -9653.1
No. Observations:       21597          AIC:                   1.931e+04
Df Residuals:           21594          BIC:                   1.934e+04
Df Model:                2
Covariance Type:        nonrobust

=====
                   coef      std err          t      P>|t|      [0.025      0.975]
-----
const             12.2185      0.006    1915.967      0.000      12.206      12.231
sqft_living        0.0004    2.85e-06    140.760      0.000      0.000      0.000
sqft_lot        -2.695e-07    6.31e-08     -4.269      0.000    -3.93e-07    -1.46e-07
=====

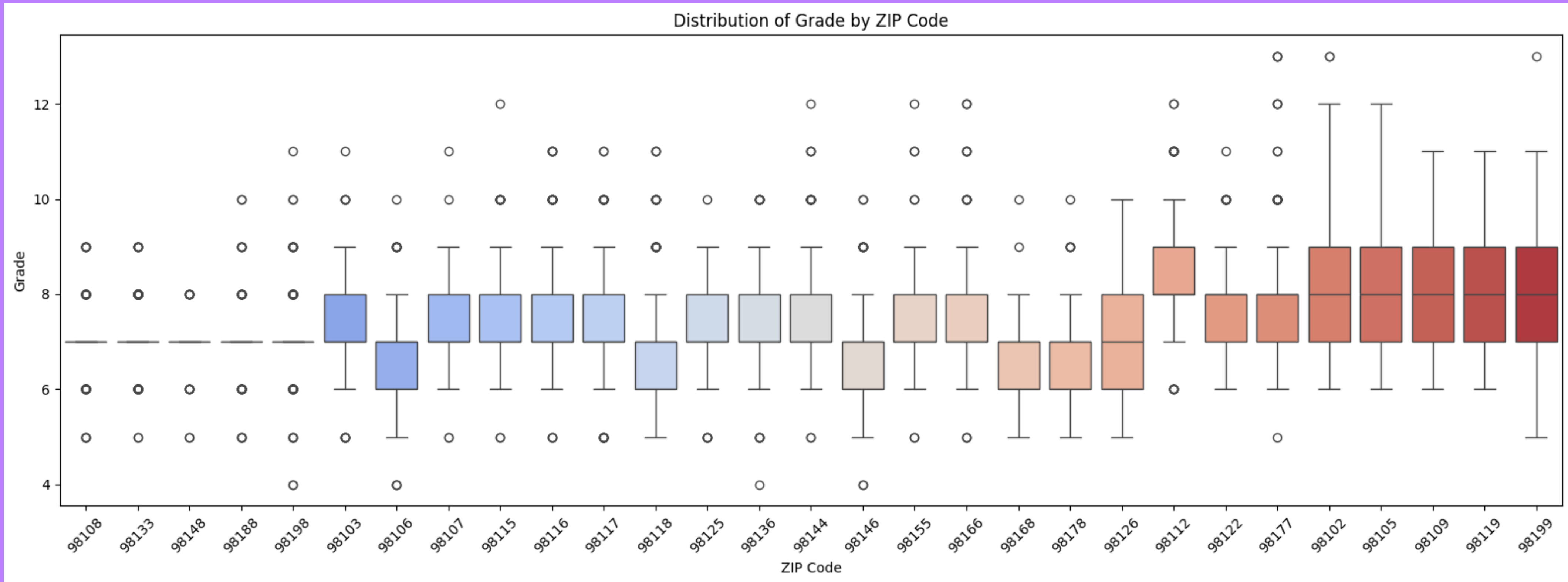
Omnibus:                 3.789    Durbin-Watson:           1.978
Prob(Omnibus):            0.150    Jarque-Bera (JB):         3.795
Skew:                     0.027    Prob(JB):                 0.150
Kurtosis:                 2.963    Cond. No.                 1.09e+05
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Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 1.09e+05. This might indicate that there are
strong multicollinearity or other numerical problems.

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HYPOTHESIS (3)

THE DISTRIBUTION OF GRADE DEPENDS ON THE ZIP (981..)



HYPOTHESIS (3) CONCLUSION

THE DISTRIBUTION OF GRADE VALUE DEPENDS ON ZIP

GRADES ARE NOT EVENLY DISTRIBUTED, IT CLUSTERS DIFFERENTLY DEPENDING ON NEIGHBORHOOD

BUYERS AND SELLERS SHOULD CONSIDER LOCATION WHEN COMPARING GRADE AND PRICES

SIGNIFICANT NEGATIVE ON GRADE -> IN AVERAGE LESS GRADE THEN THE BASELINE (INTERCEPT)

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OLS Regression Results
=====
Dep. Variable:          grade    R-squared:                0.169
Model:                  OLS      Adj. R-squared:           0.166
Method:                 Least Squares    F-statistic:              64.90
Date:                  Do, 10 Jul 2025    Prob (F-statistic):       0.00
Time:                  18:25:09    Log-Likelihood:           -12015.
No. Observations:      8973    AIC:                     2.409e+04
Df Residuals:          8944    BIC:                     2.429e+04
Df Model:              28
Covariance Type:       nonrobust
=====

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	coef	std err	t	P> t	[0.025	0.975]
Intercept	8.2981	0.091	91.518	0.000	8.120	8.476
C(zipcode) [T.98103]	-0.8878	0.098	-9.041	0.000	-1.080	-0.695
C(zipcode) [T.98105]	-0.4596	0.109	-4.204	0.000	-0.674	-0.245
C(zipcode) [T.98106]	-1.4324	0.104	-13.800	0.000	-1.636	-1.229
C(zipcode) [T.98107]	-0.8733	0.107	-8.166	0.000	-1.083	-0.664
C(zipcode) [T.98108]	-1.2819	0.113	-11.323	0.000	-1.504	-1.060
C(zipcode) [T.98109]	-0.2797	0.127	-2.207	0.027	-0.528	-0.031
C(zipcode) [T.98112]	0.1443	0.107	1.352	0.177	-0.065	0.354
C(zipcode) [T.98115]	-0.9362	0.098	-9.511	0.000	-1.129	-0.743
C(zipcode) [T.98116]	-0.7284	0.104	-7.005	0.000	-0.932	-0.525
C(zipcode) [T.98117]	-1.0160	0.099	-10.280	0.000	-1.210	-0.822
...						

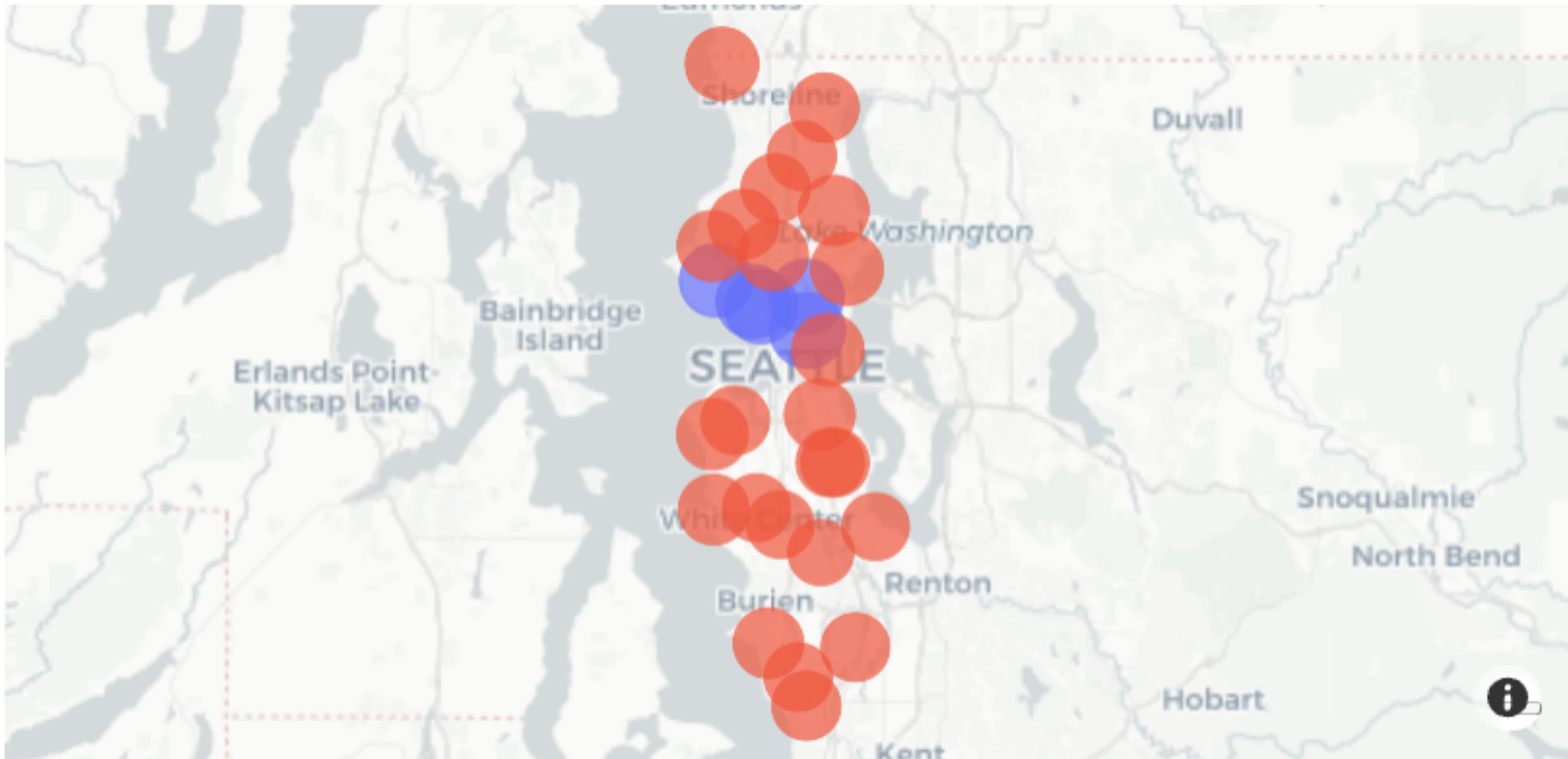
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Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

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HYPOTHESIS (3)

High-Grade vs. Low-Grade ZIP Clusters



98102	High-Grade >=8
98119	High-Grade >=8
98112	High-Grade >=8
98109	High-Grade >=8
98199	High-Grade >=8

AMY HAS PRIME-LOCATION
PROPERTIES IN DOWN-TOWN
SEATTLE, SHE TOLD ME :-)

TAKE-AWAY AMY

HIDE ON THE OUTSKIRTS OF THE CITY BUT NOT OUTSIDE SEATTLE

DO NOT OVERVALUE LOT-SIZE

THEIR PROPERTIES ARE LOCATED IN PRIME LOCATIONS

