

MURAT KURT

# EDA-PROJECT SPICED

2025-07-11

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



# CLIENT-REQUIREMENTS

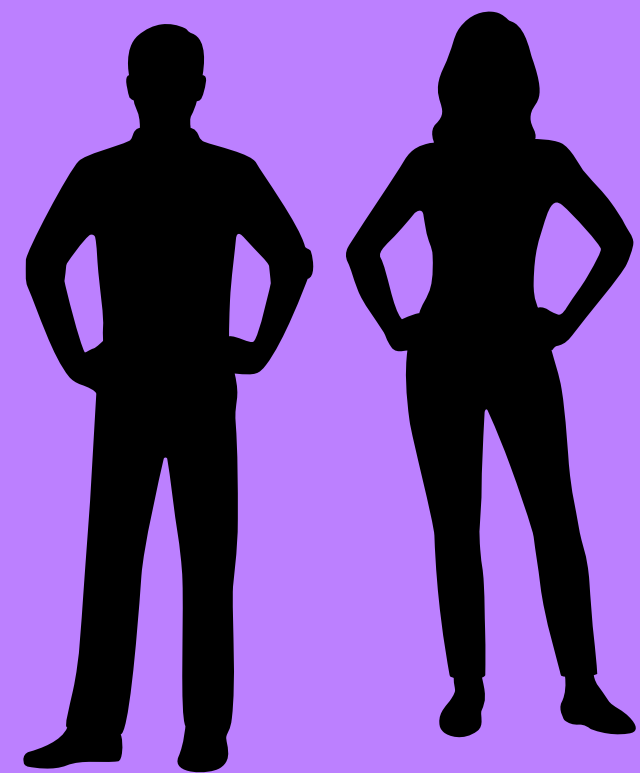
AMY WILLIAMS

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

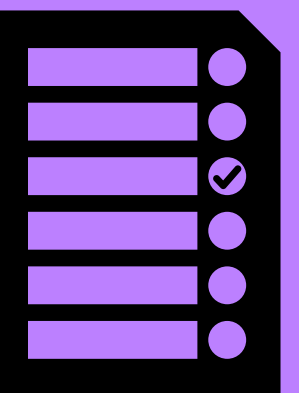


# CUSTOMER REQUEST FROM AMY

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



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

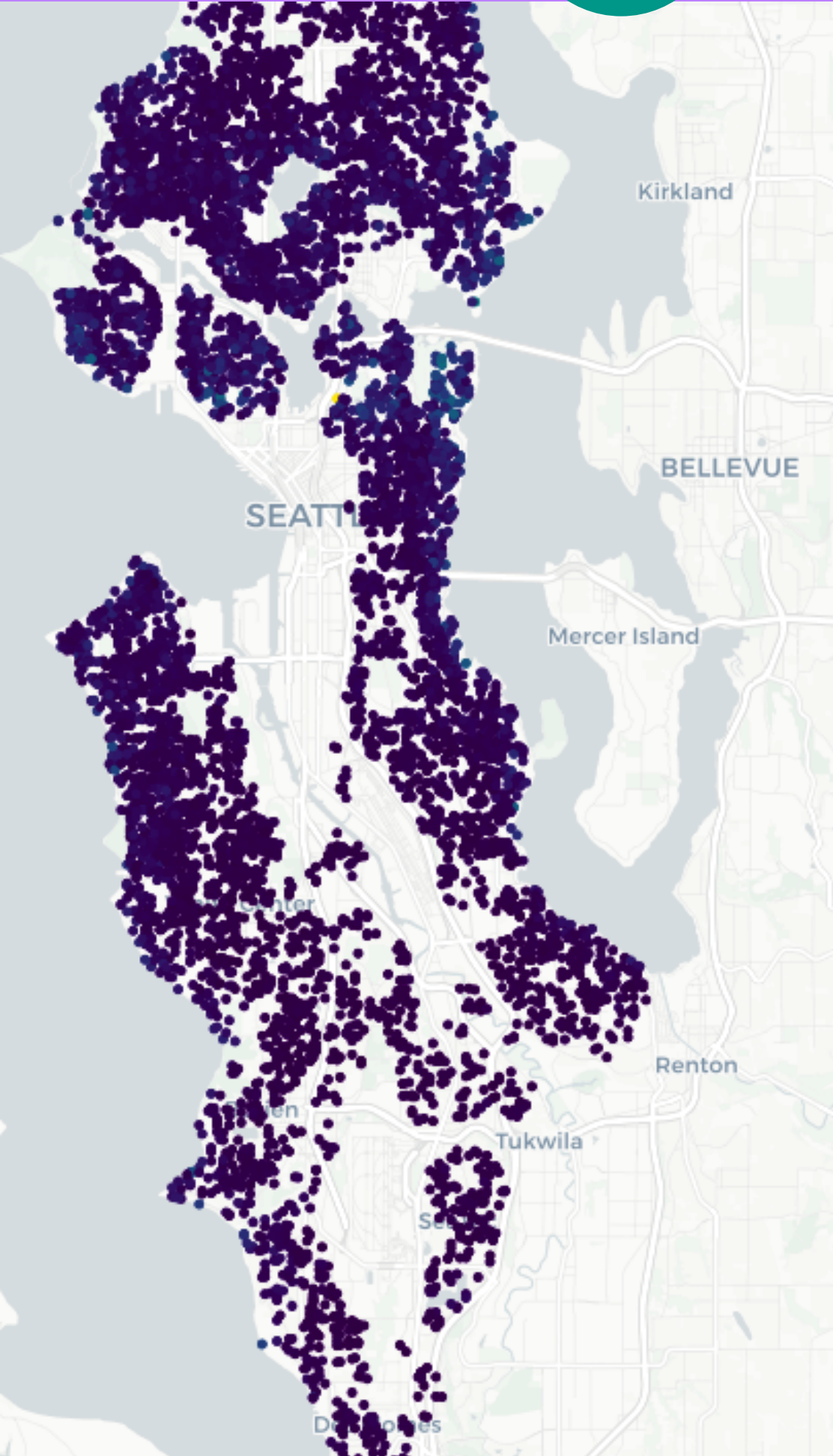
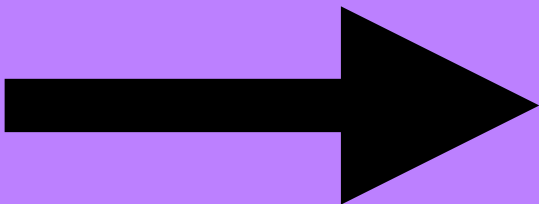


# HYPOTHESIS (1)

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

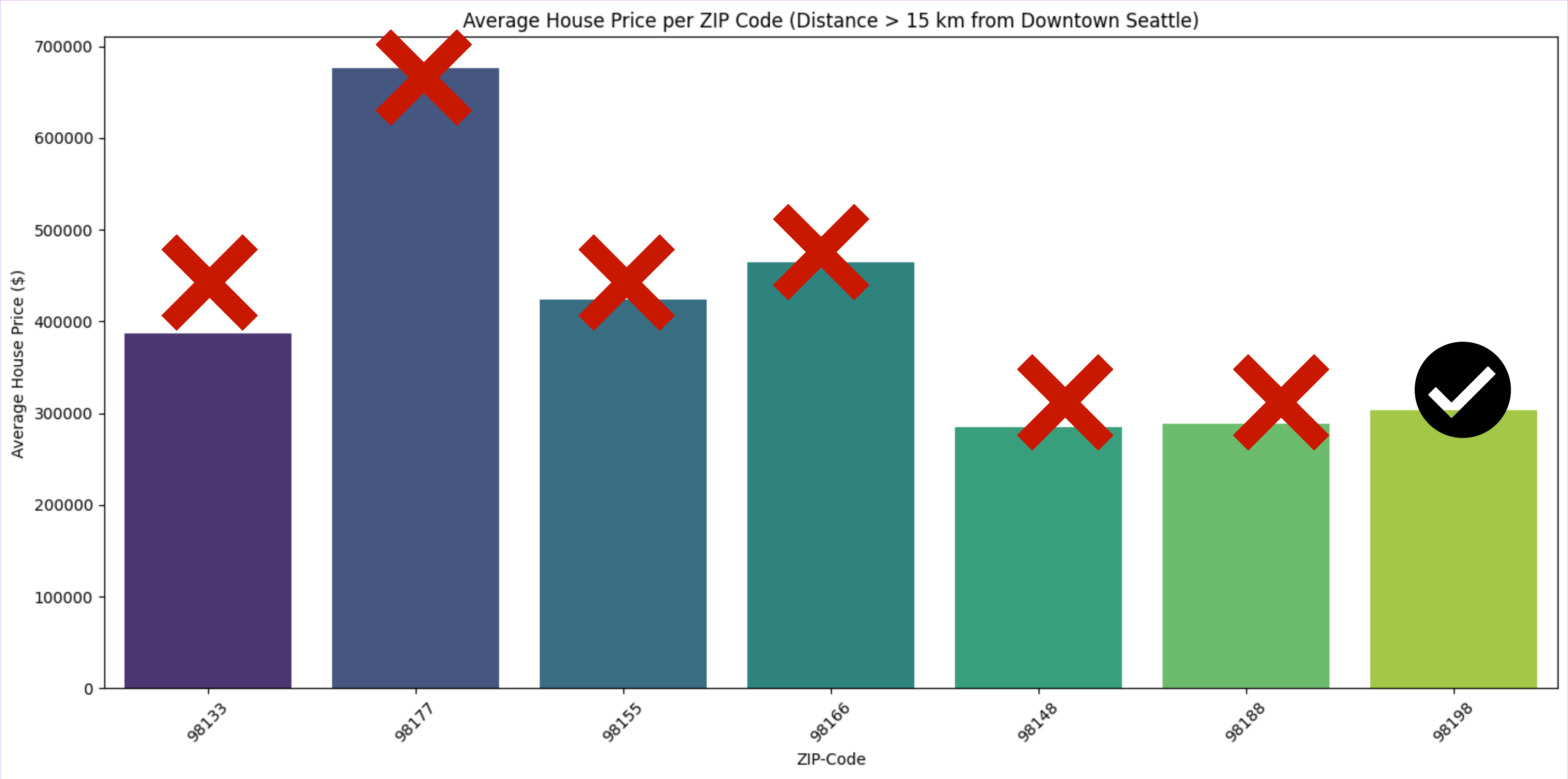


# PERIPHAL DEFINITION (OUTSIDE CITY YES/NO)



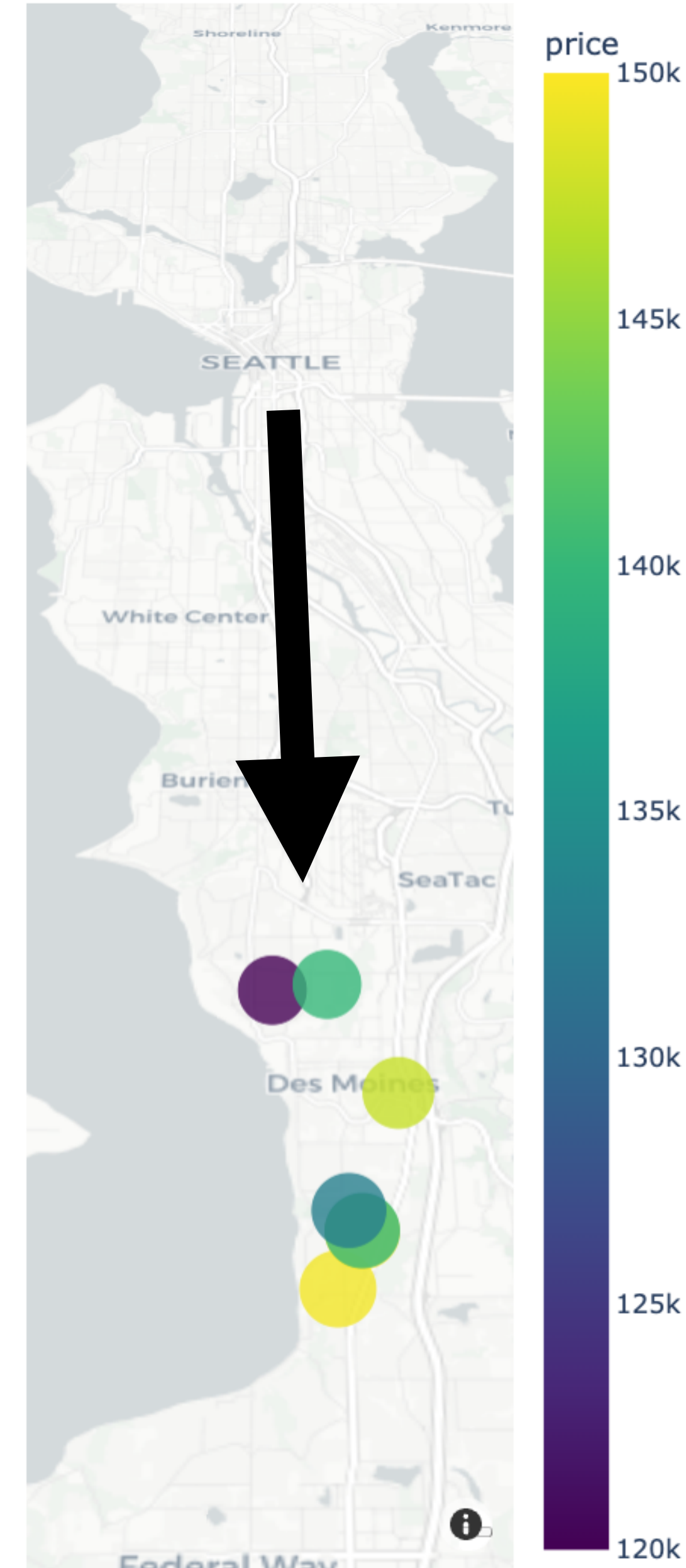
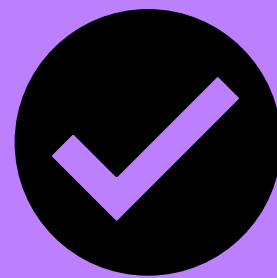


# PERIPHERAL DEFINITION > 15 KM (SEARCH FARTHEST LOCATION)

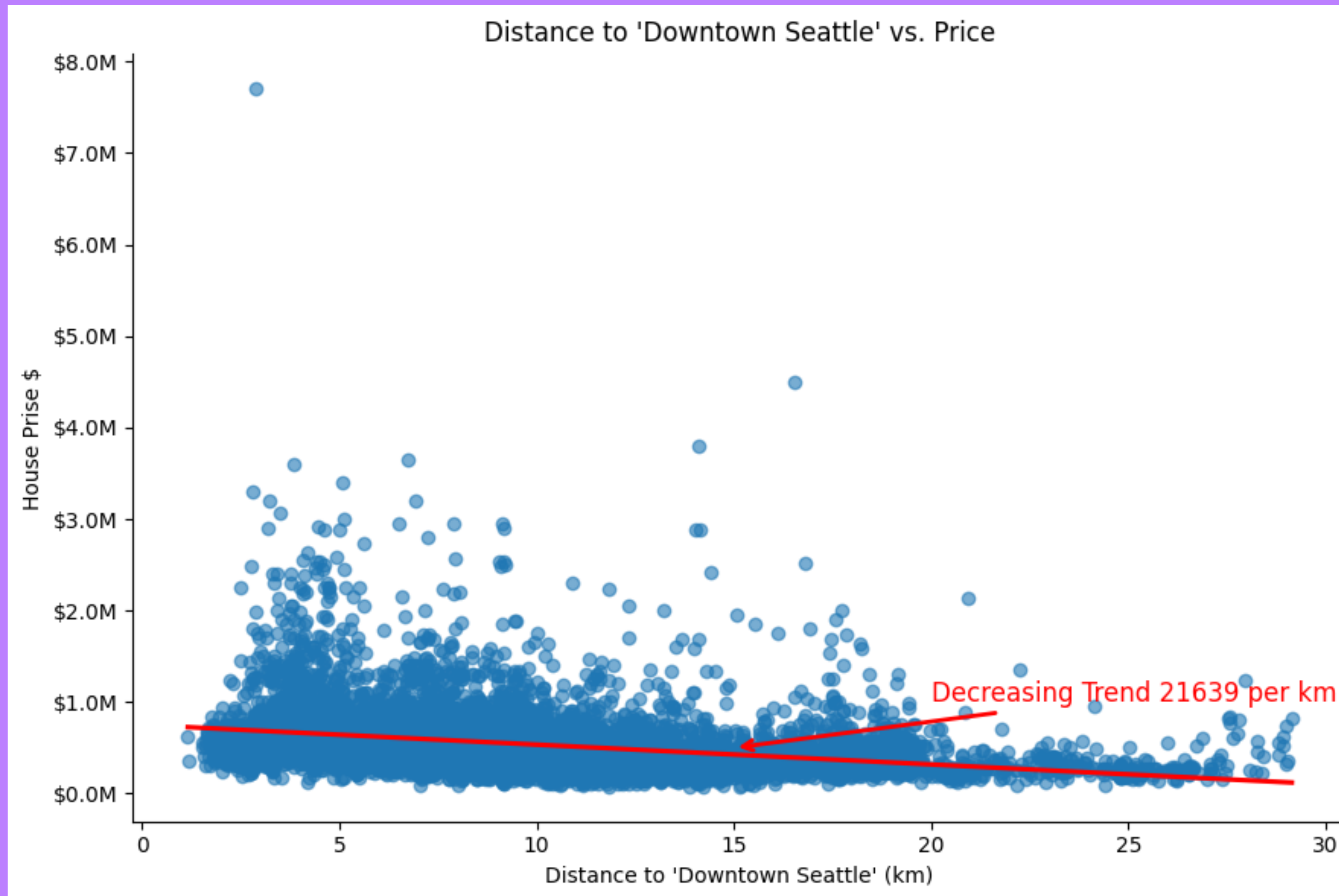


# PERIPHAL PROPERTY OPPORTUNITY

- **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)

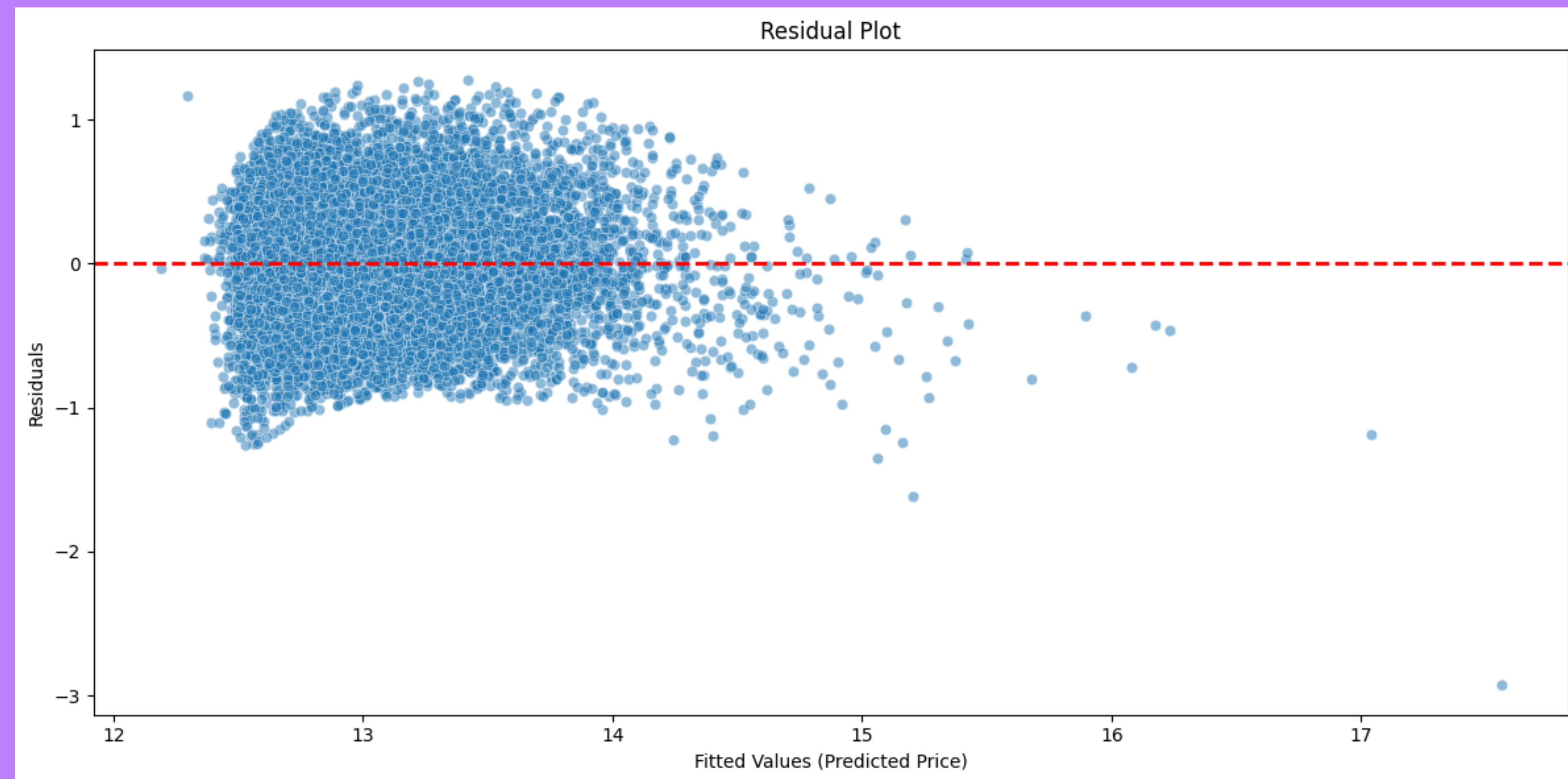
**BOTH, LIVING SPACE AND LOT ARE SIGNIFICANT FOR PRICE**

**PRICE -> LOG(PRICE)**

—> **LOG(\$ 50000000) = 7.67**

—> **LOG(\$ 50000) = 4.67**

—> **AVOIDING EFFECT OF OUTLINERS**



# HYPOTHESIS (2) ANALYSIS

## 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

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=====
OLS Regression Results
=====
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

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	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

### Notes:

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

[2] The condition number is large,  $1.09\text{e}+05$ . This might indicate that there are strong multicollinearity or other numerical problems.



# HYPOTHESIS (2) CONCLUSION FOR AMY

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

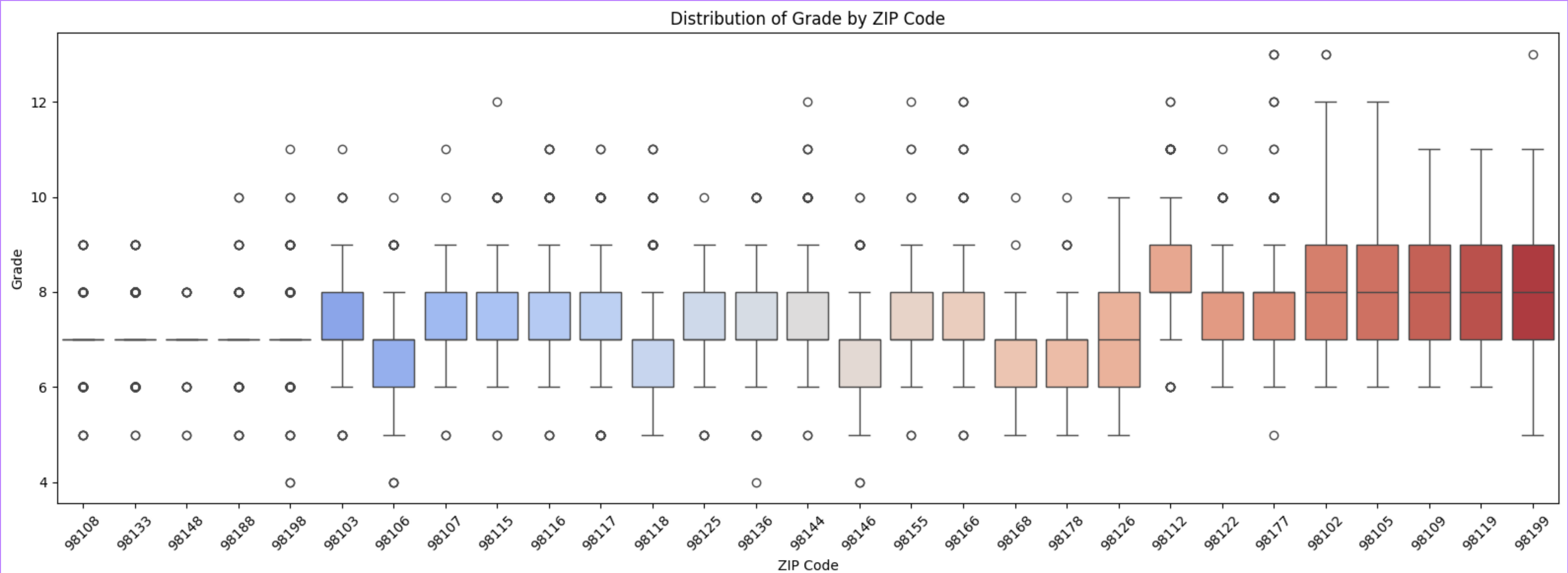
AMY SHOULD CONCENTRATE MORE ON  
THE SQUARE FOOTAGE DETAILS :-)



# HYPOTHESIS (3)

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

# HYPOTHESIS (3) ANALYSIS





# HYPOTHESIS (3) ANALYSIS

## THE DISTRIBUTION OF GRADE VALUE DEPENDS ON ZIP, YES

## 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
...						

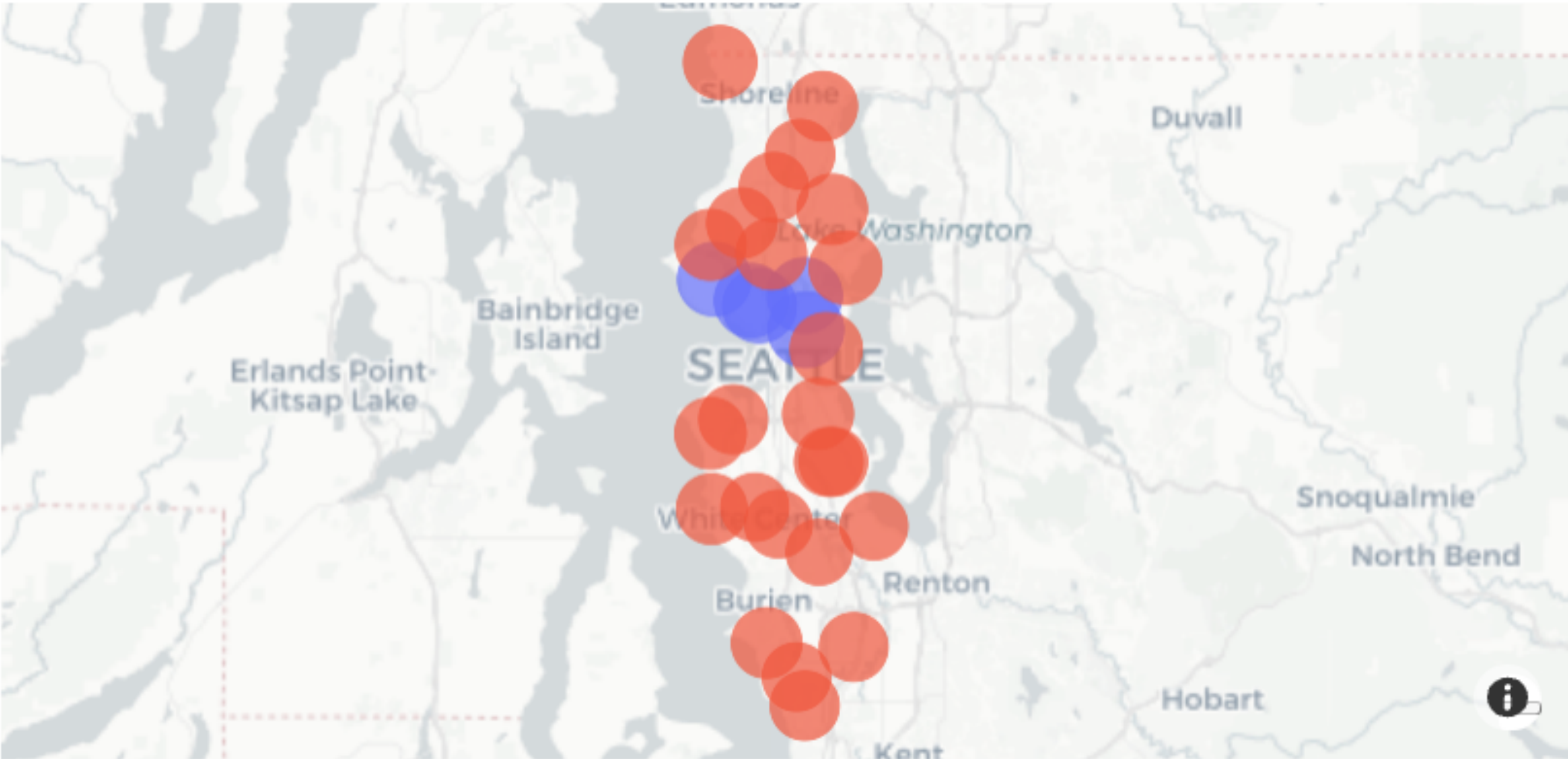
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Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

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# HYPOTHESIS (3) CONCLUSION FOR AMY

High-Grade vs. Low-Grade ZIP Clusters



cluster  
● High-Grade  $\geq 8$   
● Low-Grade

98102	High-Grade $\geq 8$
98119	High-Grade $\geq 8$
98112	High-Grade $\geq 8$
98109	High-Grade $\geq 8$
98199	High-Grade $\geq 8$

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

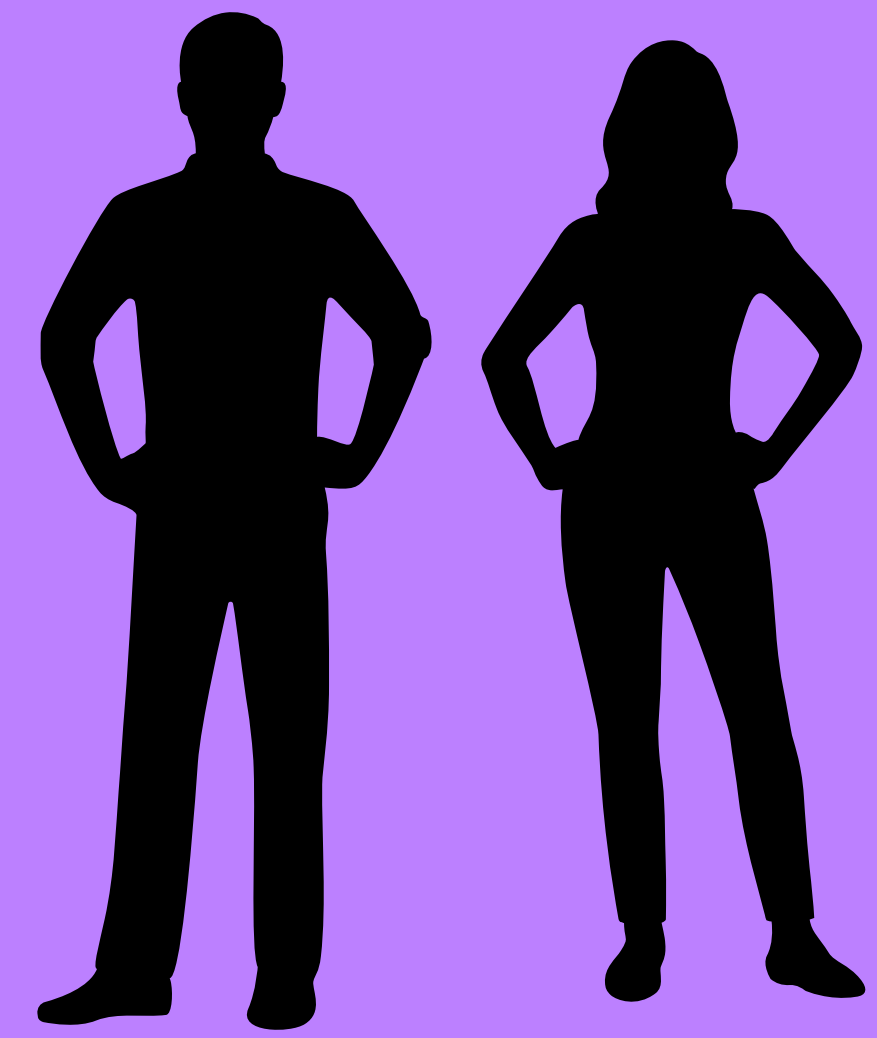
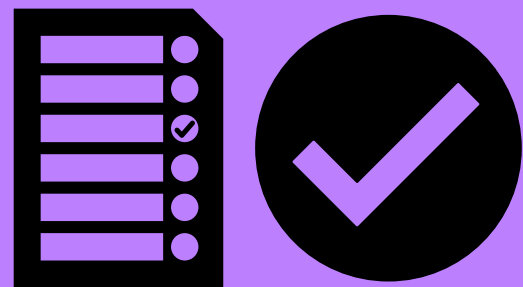


# TAKE-AWAY AMY

HIDE ON THE OUTSKIRTS OF THE CITY BUT NOT OUTSIDE SEATTLE

DO NOT OVERVALUE LOT-SIZE

THEIR PROPERTIES ARE LOCATED IN PRIME LOCATIONS





# TAKE-AWAY MURAT

FONT-SIZE TO SMALL

USE NOT „I HAVE“, „I WORKED“ ETC.

USE BETTER COLORS

HAVE A BETTER EYE CONTACT WIT AUDIENCE

CHART TITLES AND LABELS ARE TO SMALL

DON'T LOOK TO MUCH ON MONITOR

DON'T TELL, WHAT YOU ARE NOT DID OR WAS ABLE TO DO

CHANGE NO TOPIC WITHOUT AGREEMENT WITH TEAM OR STAKEHOLDERS

SLIDES-NUMBERS