

What adds value when selling a home in Ames?

Party Parrots



Here's the Shortlist



Neighborhoods?

| Rank | Features |
|------|---|
| 1 | Overall Quality |
| 2 | Living Area - Total sq. ft. (above ground) |
| 3 | Garage - # of Cars |
| 4 | Basement - Total sq. ft. |
| 5 | First Floor - Total sq. ft. |
| 6 | Basement Finish 1 - sq. ft. |
| 7 | Lot Area |
| 8 | Renovation Age |
| 9 | House Age |
| 10 | Bed / Bath Ratio (above ground) |
| 11 | Overall Condition |
| 12 | Porch |
| 13 | Garage - Year Built |
| 14 | Garage - Type |
| 15 | Central Air |



Ames, Iowa Background

A little bit about Ames

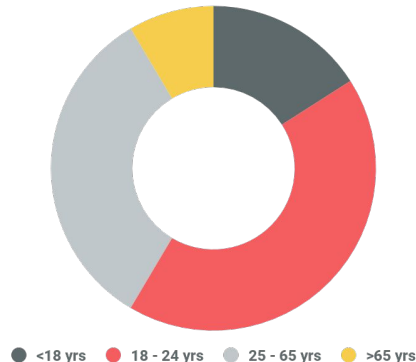
Community

2019 Population: 66,258

Median Household Income: \$46,127

Poverty Rate: 28%

Persons by Age



Weather

Average Tornadoes in Iowa: 37 per year

Basements are required by law in all residential homes for shelter protection during tornadoes

Weather history for Ames, Iowa

Average temperature

November

48 / 28 °F | C

Record temps 78° / -4° F
Avg rainfall 1.89 in
Snow 5 days



A little bit more about Ames

Iowa State University: 33,391 students, home of the Cardinals, largest employer in Ames

Other Top Employers: Iowa Department of Transportation, College of Veterinary Medicine

Community: agriculture, animals/pets, small town charm with opportunities & amenities from a major university



Houses in Ames

Total housing units: 26,754*

Avg square footage of a home: 1,486 sq. ft.

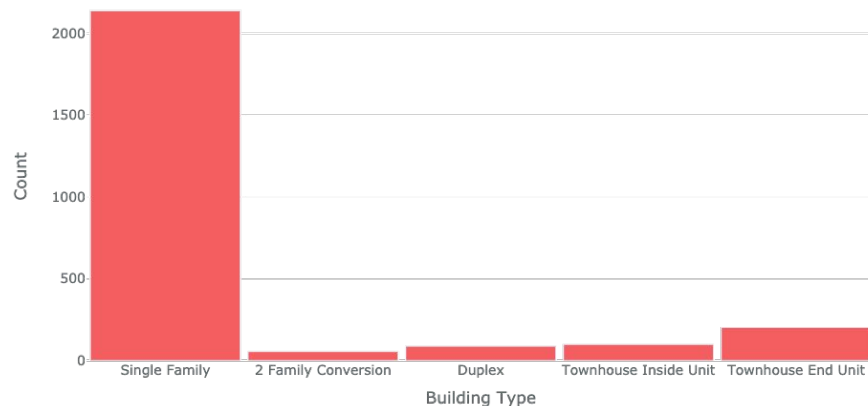
Avg persons/household: 2.21

Mean travel time to work / study : 9.3 min**

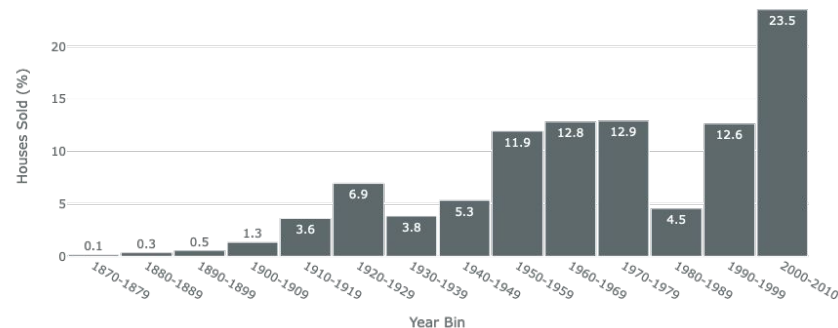
Hottest Season to Sell a House: May~July

Avg bathroom above ground: 1.7

Popular Housing Types In Ames, IA



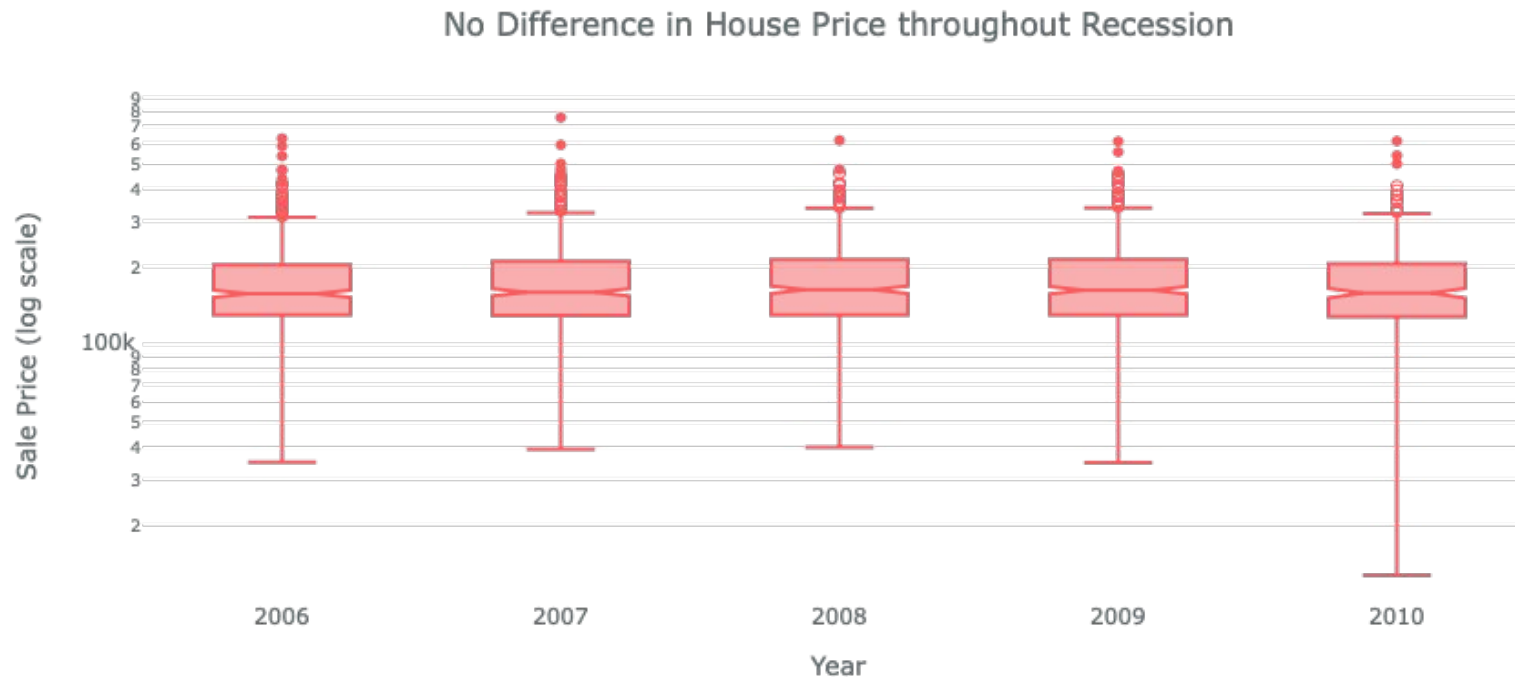
Most Houses Sold are Relatively New



*Data as of 2020

**Calculated with the help of Google Distance Matrix API

House Prices in Ames



Digging Deeper

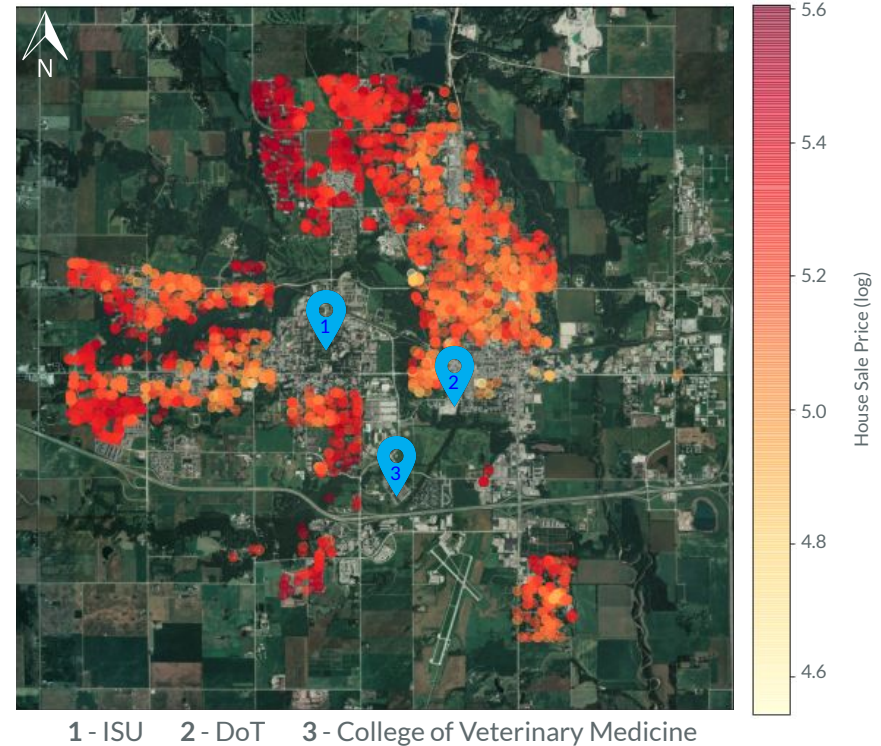
Location, location... location?

KNN Regression

- ~64% of house sale prices* can be explained by pure location

OLS Regression

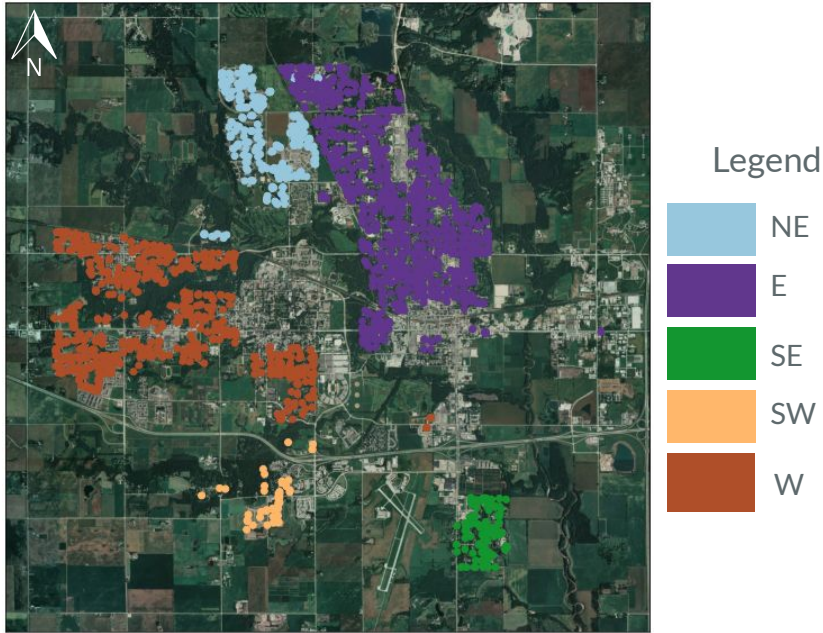
- ~92% of neighborhoods are significant when only considering neighborhoods
- ~77% of neighborhoods are significant when adding one additional feature - *what's going on?*



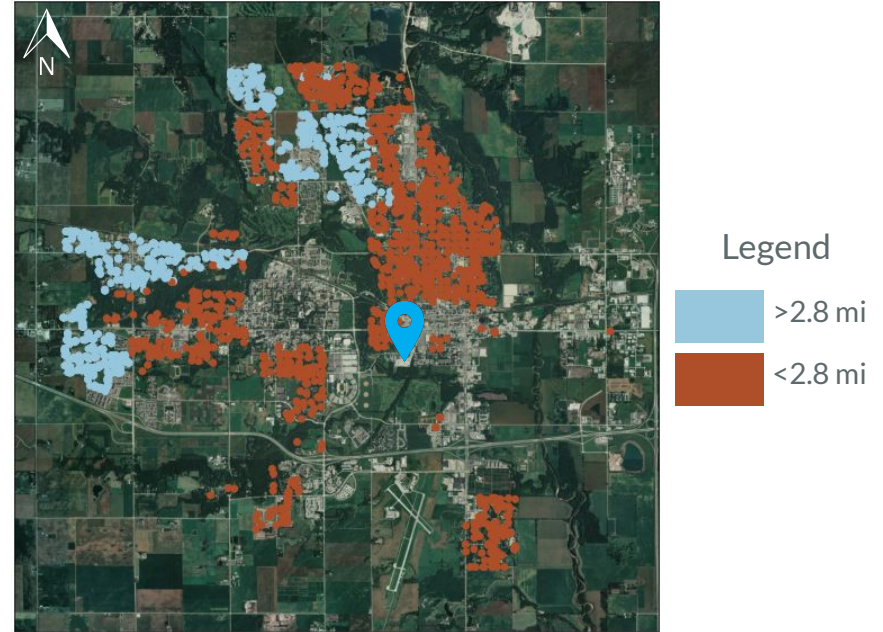
*This is only when modelling latitude + longitudes of houses against sale price

Neighborhood Grouping

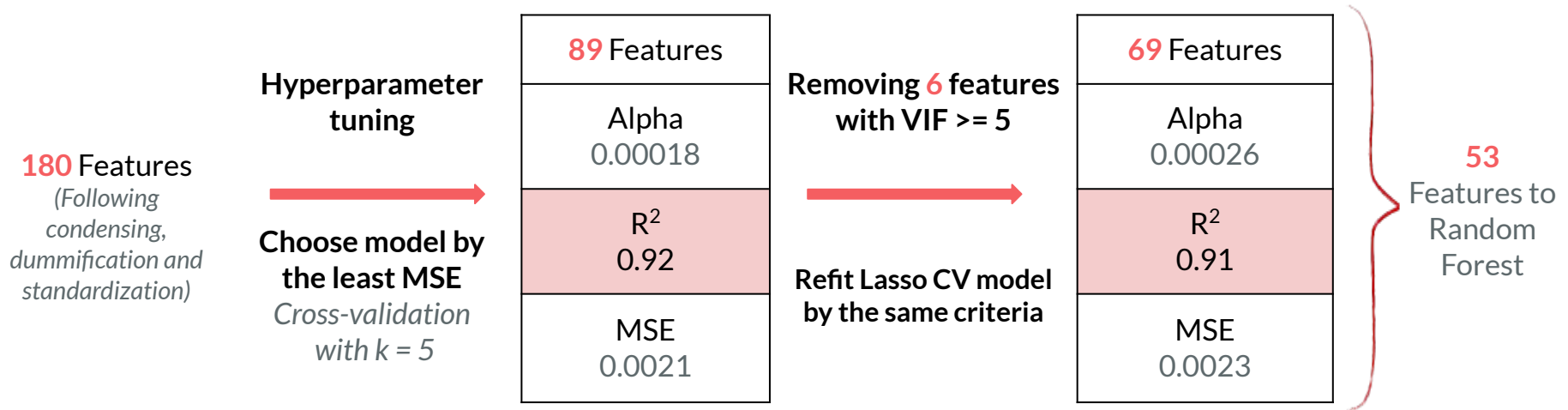
Geographical



Route to Major Work / Study Areas



Lasso CV as a base model



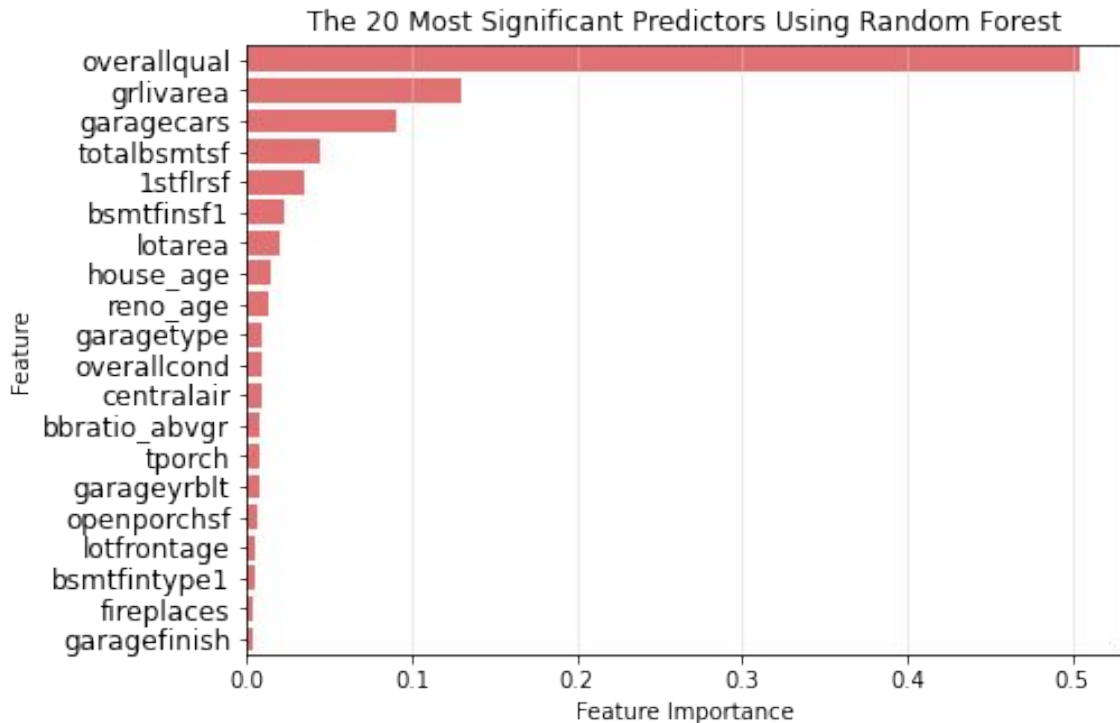
What about a Random Forest?

Model #1

Training R^2 : 0.987

Test R^2 : 0.912

Features: 20



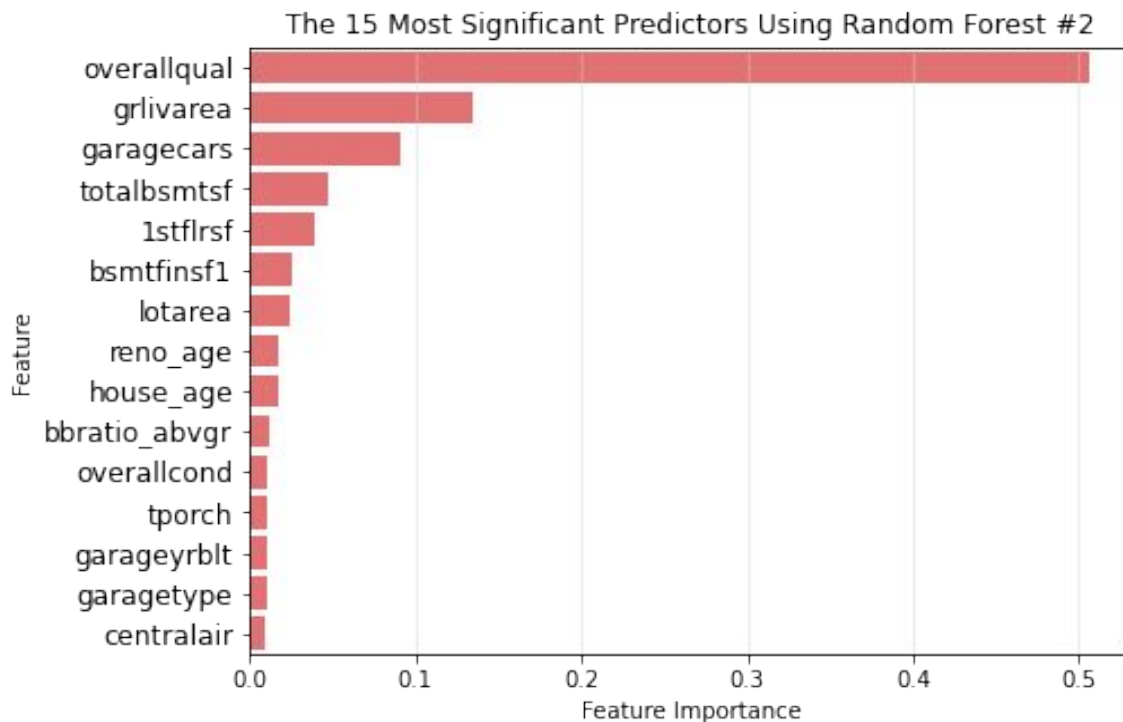
Our Best Random Forest

Model #2

Training R^2 : 0.985

Test R^2 : 0.896

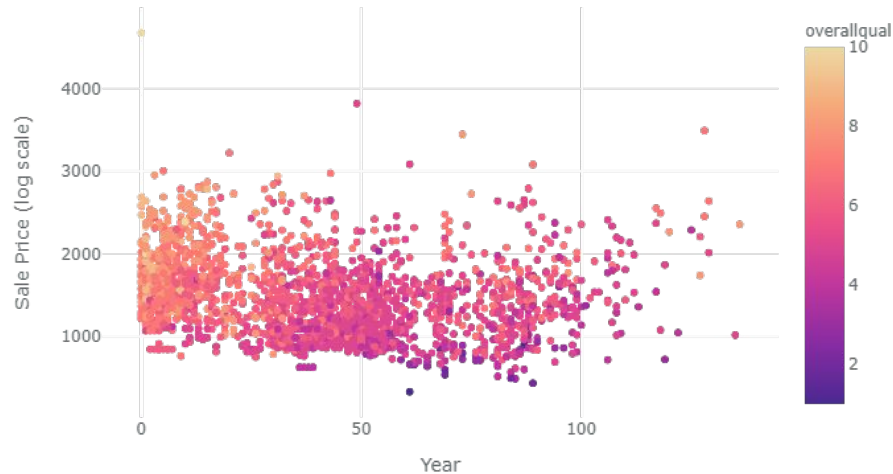
Features: 15



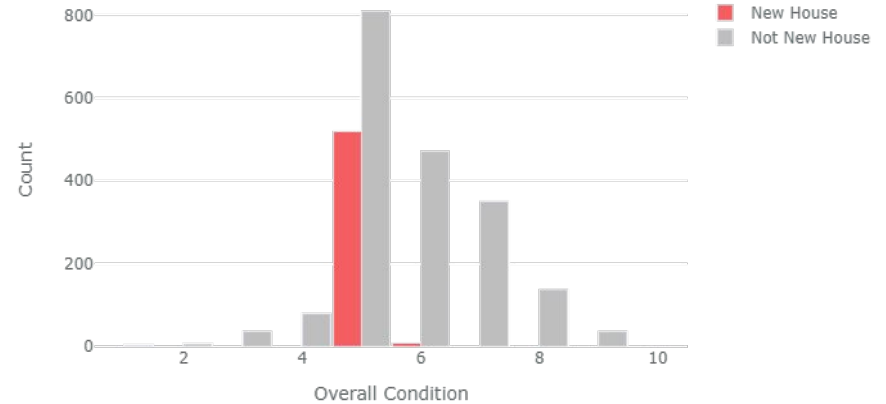
Going back to our
shortlist

Limitations of the data set

Multicollinearity between independent variables



Inbalanced Overall Condition Rating for Newer Houses



Conclusion

- Many of the features shown **cannot** be changed
 - New homes sell well due to their *customizable* nature
 - 33% of features put emphasis on *space* - hence the outer limits of Ames with newer homes have a higher price range
- However, small changes can still be made to drive value
 - A *customization* opportunity for selling appeal!



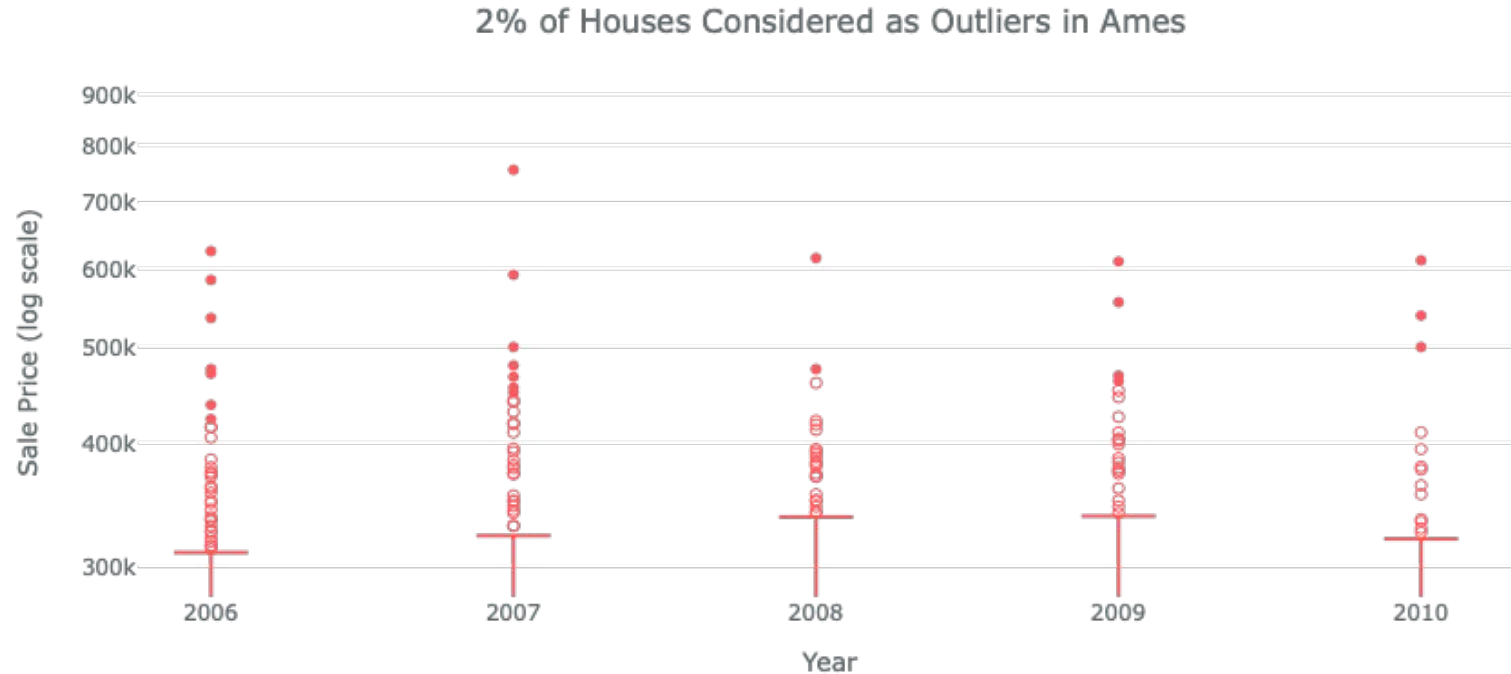
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Thank you!

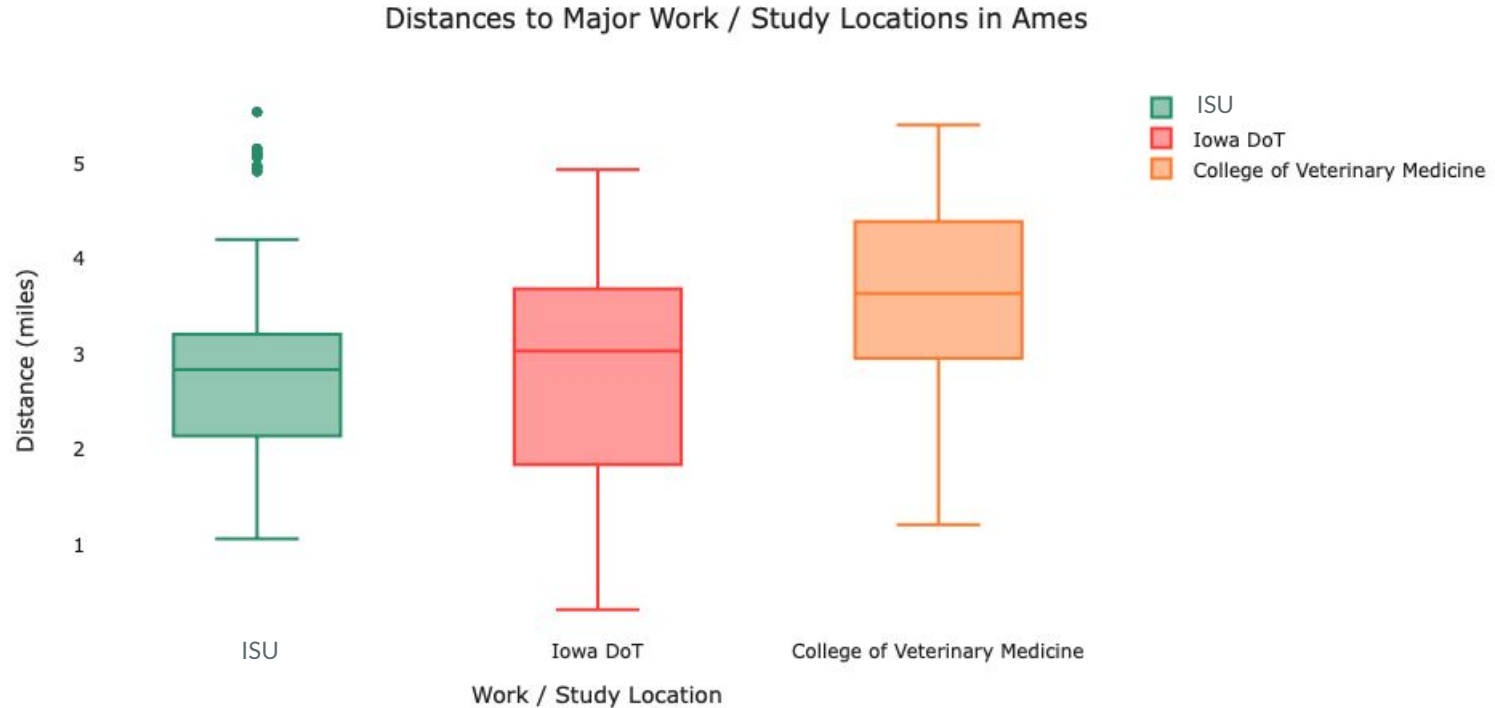
Any questions?

Appendix

Outliers in House Prices



Distances to Major Work / Study Locations



Data Preparation Procedure

