HOUSING PRICE PREDICTIONS

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PROBLEM STATEMENT

Identifying features helpful in predicting housing prices and using a model to give us the best r2 score

DATASET

- Housing prices from Ames
- The training set had more than 2000 observations and 80 features
- Some observations: Fireplaces, Year Built, Garage Cars, Kitchen Quality, etc.
- The validation set had less than 900 observations
- The model has to be evaluated on the training data and then tested on the testing data
- Predictions are made and then it is tested against the dataset from Kaggle which calculates the MSE

WHERE DO WE START? STEP 1

DATA CLEANING

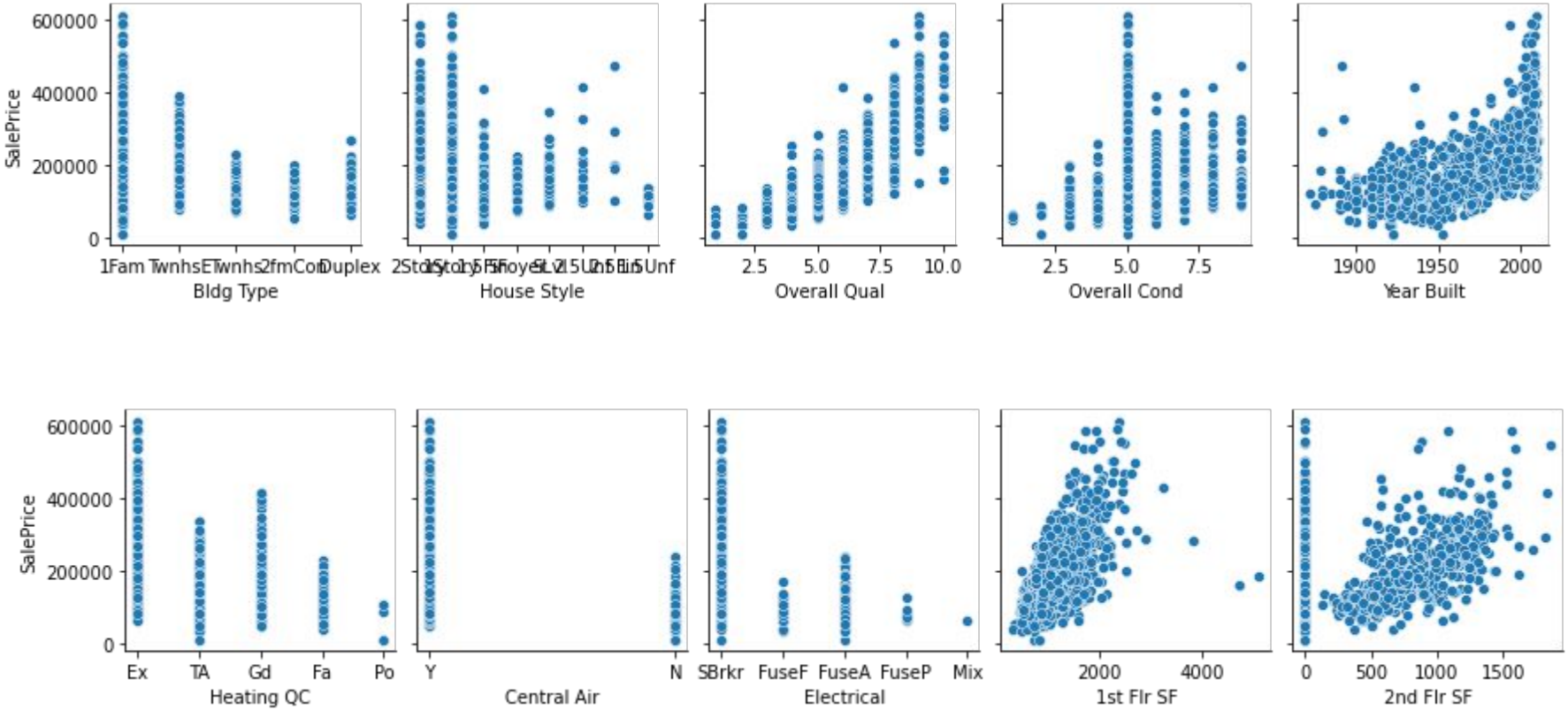
- Cleaning the training and validation sets.
- Making sure they had the same number of features
- Deciding what to do with null values, replace, remove or just leave it.

STEP 2: FEATURE ENGINEERING

- Lots of features that were numerical but could be classified as categorical
- Dummify columns

STEP 3: FEATURE SELECTION

- Correlation
- On going process
- Using judgement to select features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1Fam
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Bldg Type
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SFoyer
SLvl
1.5Unf
2.5Fin
2.5Unf
House Style
2.5
5.0
7.5
10.0
Overall Qual
Overall Cond
1900
1950
2000
Year Built
Ex
TA
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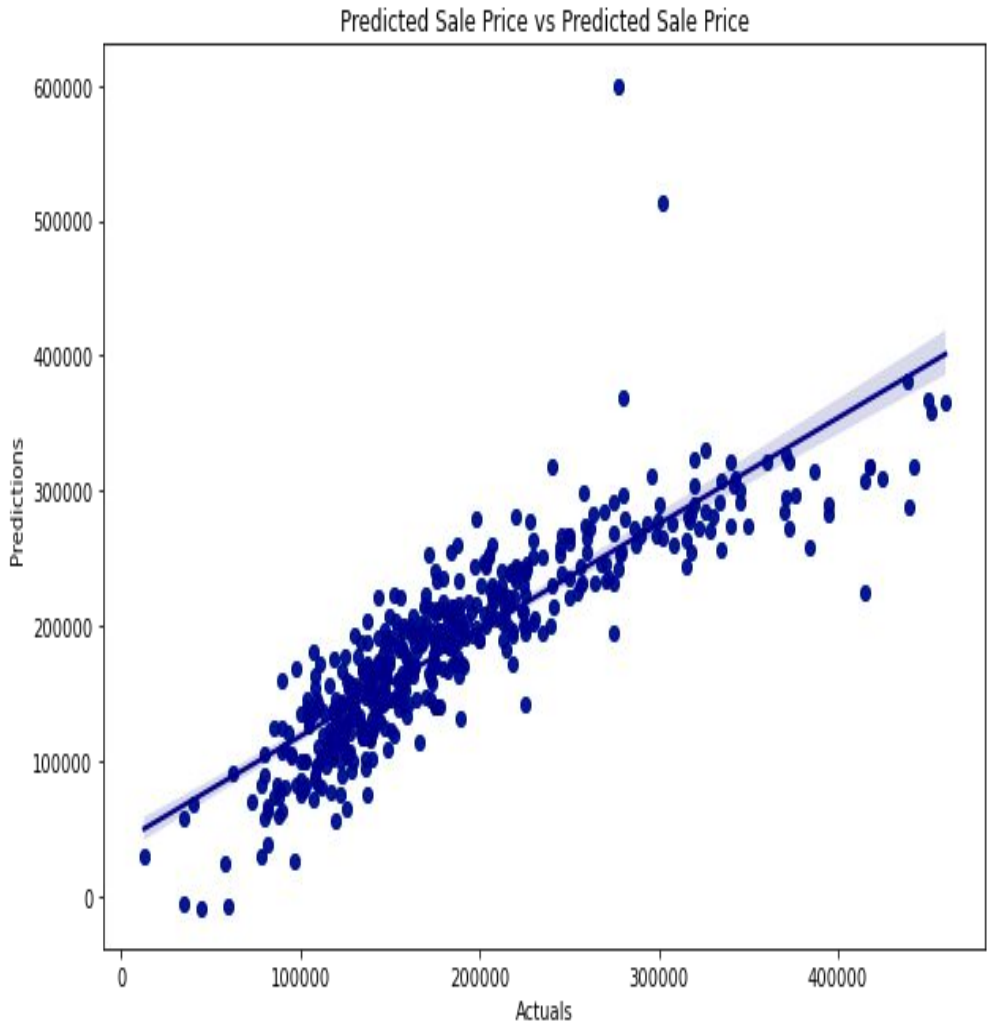
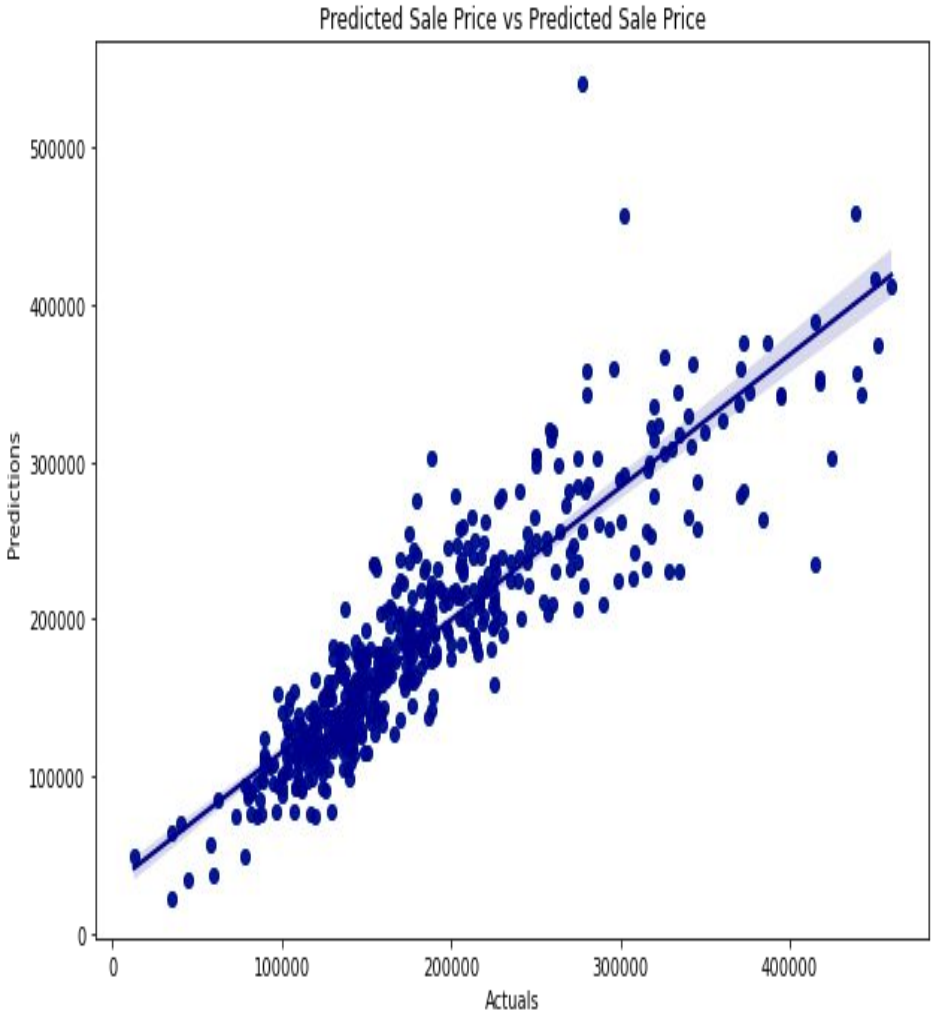
Po
Heating QC
Y
N
Central Air
SBrkr
FuseF
FuseA
FuseP
Mix
Electrical
2000
4000
1st Flr SF
0
500
1000
1500
2nd Flr SF

MODELING AND EVALUATION

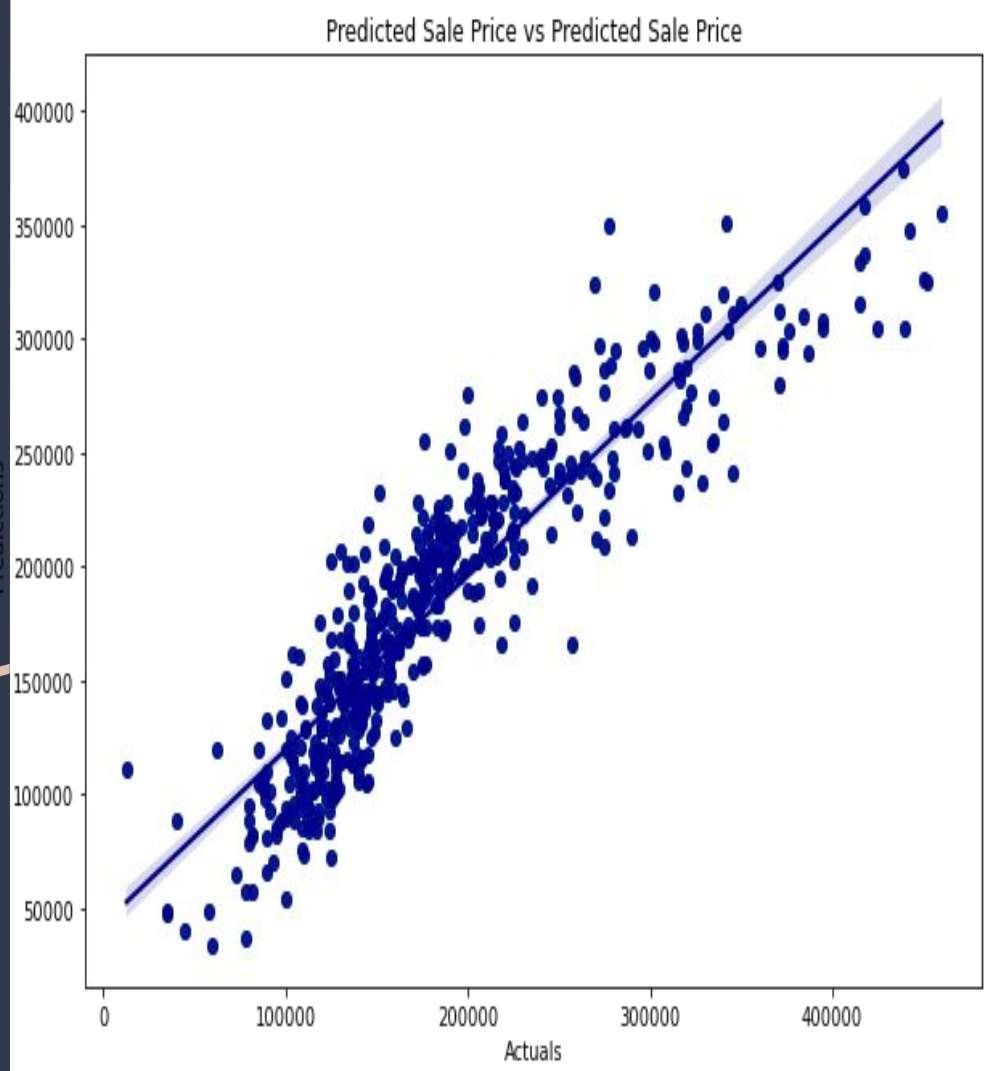
- Features -> Lot Area, Overall Qual, Overall Cond, Year Built, Year Remod/Add, Mas Vnr Area, Bsmt Full Bath, Bsmt Half Bath, Full Bath, Half Bath, Fireplaces, Bedroom AbvGr
- Kaggle RMSE - $38, 522
- Multicollinearity
- More numerical features



- Features -> Sale Type_New, Full Bath, Bsmt Exposure_Gd, Roof Style_Hip, House Style_1Story, Condition 1_Norm, Garage Cars, Year Built, Fireplaces,Neighborhood_StoneBr, Neighborhood_NridgHt, Neighborhood_NoRidge,Lot Area, Mas Vnr Area, Overall Qual, Overall Cond, Garage Cars, Screen Porch, MS Zoning_RL
- Tried to minimize multicollinearity
- Higher coefficients
- Kaggle MSE - $36, 693
- Combination of both numerical and categorical features



- Features -> Year Built, Fireplaces, Lot Area, Open Porch SF, Mas Vnr Area, Total Bsmt SF, Gr Liv Area, Year Remod/Add, Garage Cars, Wood Deck SF
- Accuracy score was low 0.72
- Only numerical features



CONCLUSION

From the coefficients, the following are a few of the top features I would recommend to look at when making predictions/buying houses

- Overall Qual
- Mas Vnr Area
- Neighborhood_NridgHt
- Kitchen Qual
- Neighborhood_StoneBr
- Bsmt Exposure

Features with negative coefficients

- Bldg_Type_Twnhse
- Neighborhood_Edwards
- Lnd_Contour_bnk

RECOMMENDATIONS

Some of the things homeowners/property investors could improve to increase the value of houses:

- Improve the kitchen quality -> positive coeff
- Improve the overall condition of the house
- Look in neighborhoods like Stonebrook and Northbridge