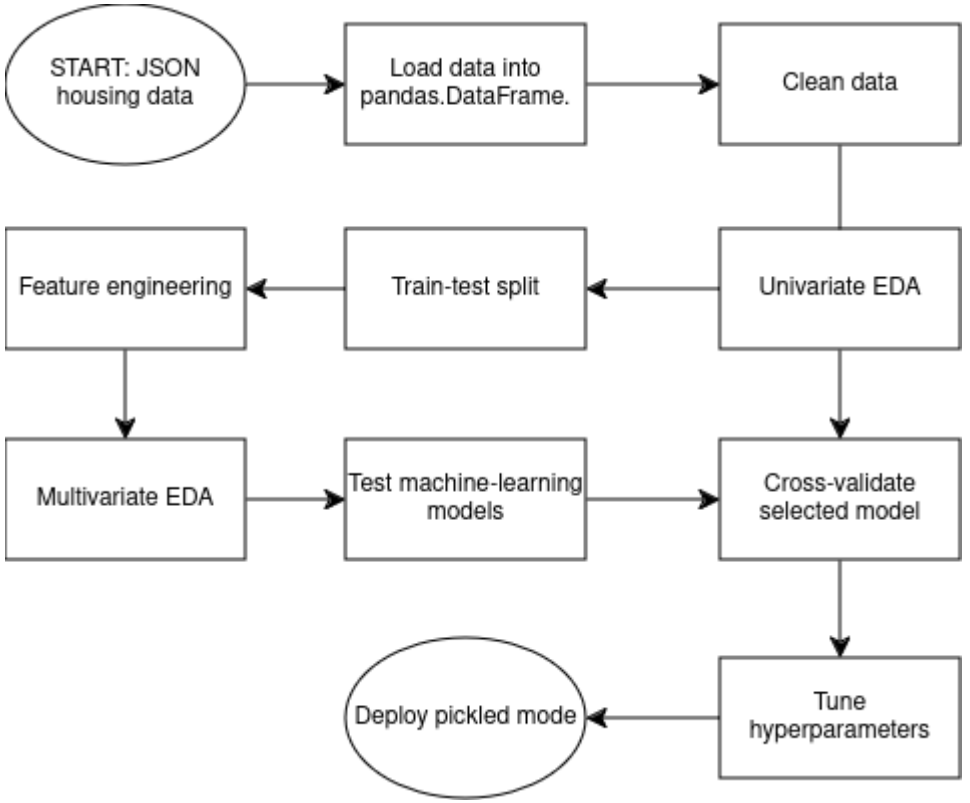
Predicting US Home Sales Prices

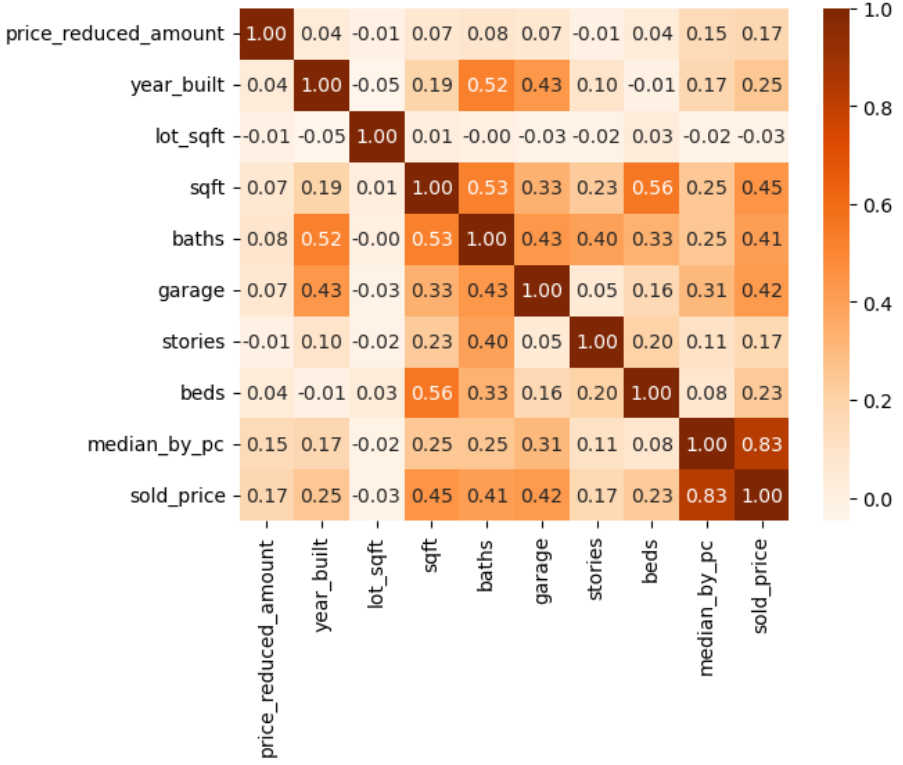
A Lighthouse Labs Data Science Bootcamp Midterm Project

Innocent Byiringiro and Derek Harnett

Process Flow Chart



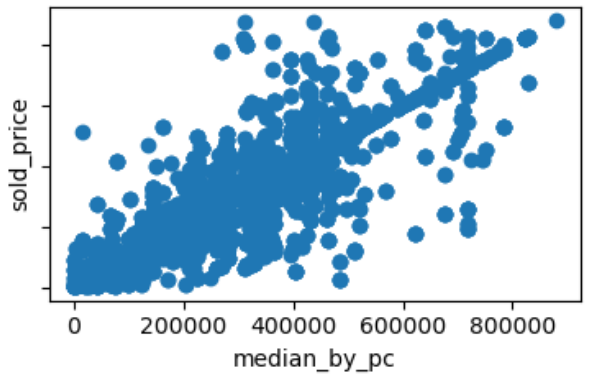
Correlation Heat Map

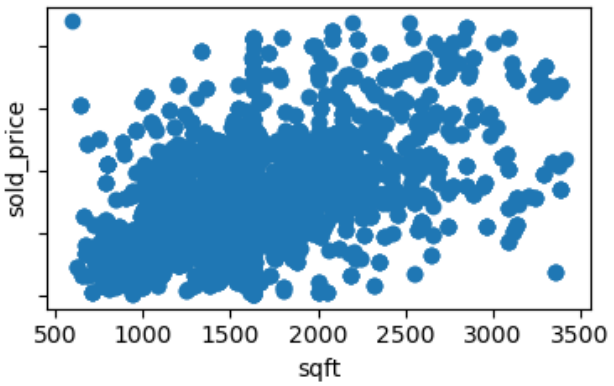


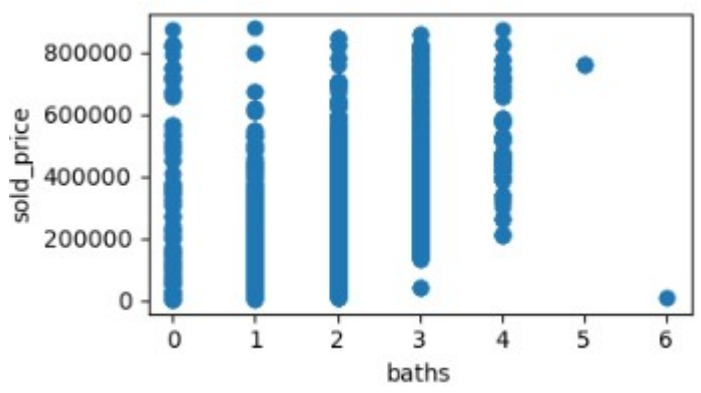
EDA suggests:

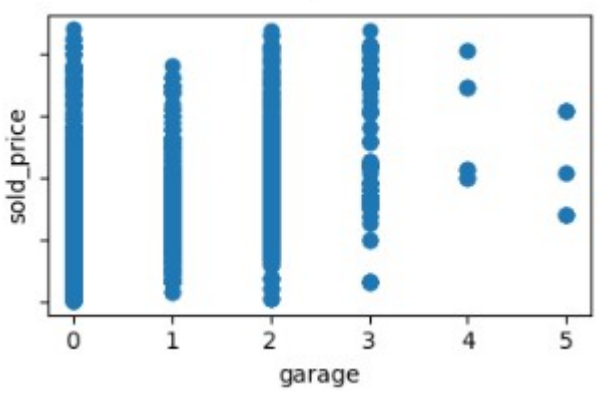
- **Median price by postal code the most significant feature**
- Square footage next most significant
- Number of bathrooms, garage size, year built, and number of bedrooms also of interest

Scatter Plots









Model Investigations

Linear (+ Regularization):
- OLS, Ridge, Lasso
- *MinMaxScaler()*
- *SelectKBest(k=8)*
- *PolynomialFeatures()?*
  - No
- Testing adj. R^2: ~0.78

SVM:
- Linear, RBF kernels
- *MinMaxScaler()*
- *SelectKBest(k=8)*
- Testing adj. R^2: ~0.82 (RBF)

XGBoost:
- XGBRegressor
- RMSE: $24.6k
- R^2: 0.98

Random Forest:
- RandomForestRegressor
- RMSE: $28.7k
- R^2: 0.97

Validation, Tuning, Pickling

- Cross-validation & hyperparameter tuning done “by-hand” to **prevent data leakage.**
- Best model pickled to external file
- QA:
  - Rigorous data cleaning process
  - Multiple scores per model
  - 5-Fold cross validation