Petabyte Pirates

Team Members

Sean Miller

Farhan Hassan

Dewayne Hafenstein

Teams, GitHub, Google Colab
MS TDSP

Desired Goal(s)

Interests included:

- Housing market trends
- Predicting failure of Infrastructure
- Diagnostics for Healthcare
- Diagnostics for Machine Maintenance
- And a few more…

Decided on:

- Predict the sale price of a house going up for sale

Goals

To be able to predict the sales price of a new listing

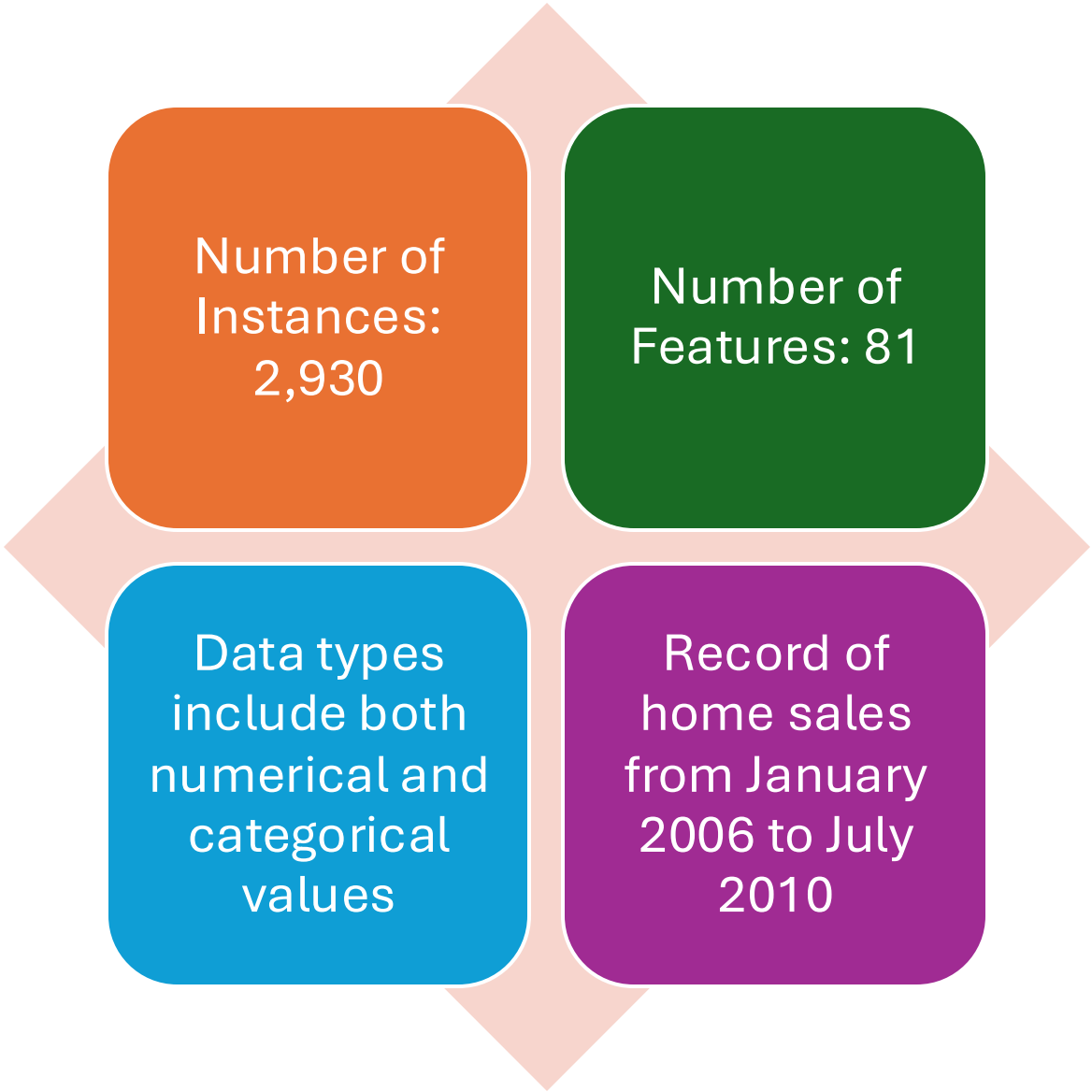
To be able to do “what-if” analysis by changing different features.

Selecting the Dataset

- We examined the available datasets on
  - Kaggle
  - Data.gov
  - FiveThirtyEight
  - Zillo
  - Redfin

- Chose
  - Ames Iowa Housing Sales from Kaggle
  - https://www.kaggle.com/datasets/shashanknecrothapa/ames-housing-dataset

Dataset Characteristics



Discovery

- Initial filtering 82 -> 13
- Number of desired features (42)
- Ratio of missing data by feature
- Correlation of features to actual sale price (picked top 13)
- Identified engineered features of interest
- Correlation of engineered features to actual sale price
- Scatter plots of all features having correlation > .50

Features in Final Data Frame

Retained 13 Raw Features

- MS SubClass
- Overall Quality
- Year Built
- Year Remod/Add
- Basement Finishings
- Total Basement Square Feet
- First Floor Square Feet
- Above Ground Living Area
- Number of Full Baths
- Garage Year Built
- Garage Finishings
- Garage Cars
- Garage Area

Encoded 6 Features w/ Ordinal Mapping

- Exterior Quality
- Basement Quality
- Heating Quality
- Kitchen Quality
- Fireplace Quality
- Functional

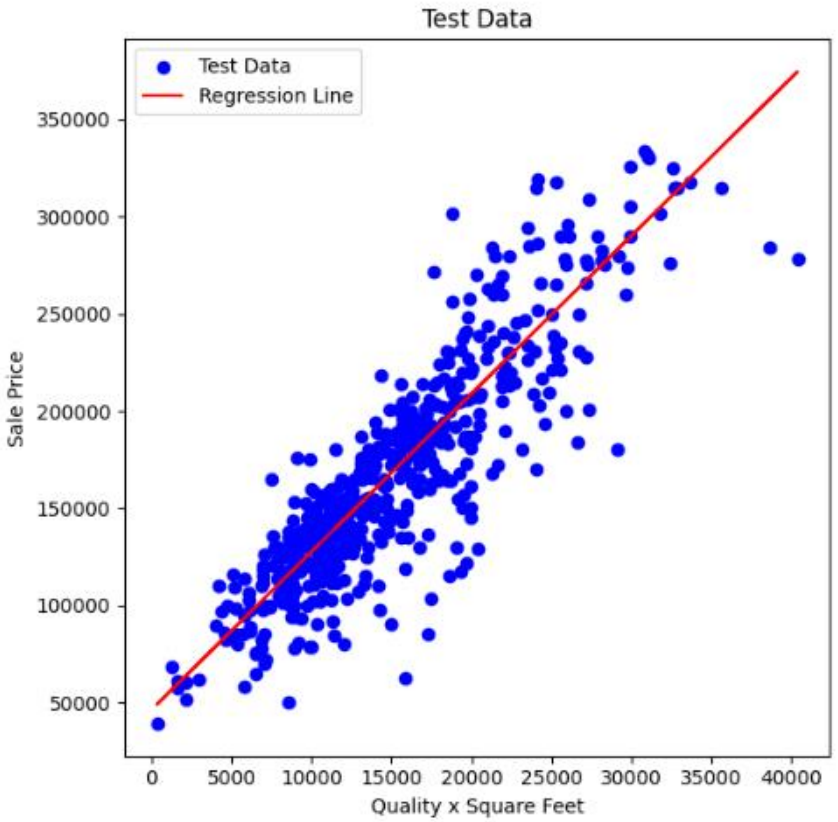
One-Hot Encoded 13 Features

- Neighborhood
- House Style
- Building Type
- Sale Condition
- Sale Type
- Garage Type
- Foundation
- Exterior Primary Materials
- Exterior Secondary Materials
- MS Zoning
- Lot Shape
- Lot Config
- Primary Condition

Engineered 10 Features

- Quality x Square Feet
- Sale Date (Yr Sold + Mo Sold)
- House Age
- Remodel Age
- Age Bucket
- Total Square Feet
- Total Square Feet w/ Garage
- Total Baths
- Price per Square Feet
- Season Sold

Analysis


Test Data
Test Data
Regression Line
Sale Price
Quality x Square Feet
0
5000
10000
15000
20000
25000
30000
35000
40000
50000
100000
150000
200000
250000
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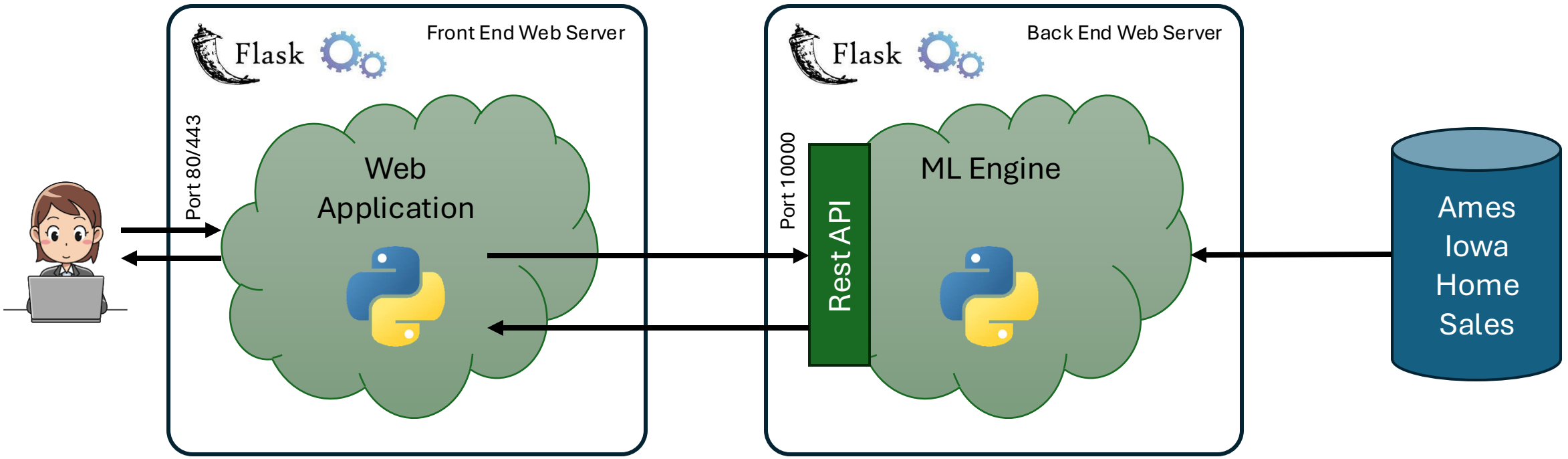
Architecture



Presentation

Form for user to input parameters to predict price of home. The result of each request is saved as a table below, allowing "what-if" comparisons.

Each result of the input calculation is saved in a table. All columns of the table are sortable. This allows the user to perform what-if comparisons and to compare multiple properties.