



# Predicting NYC Apartment Listing Prices

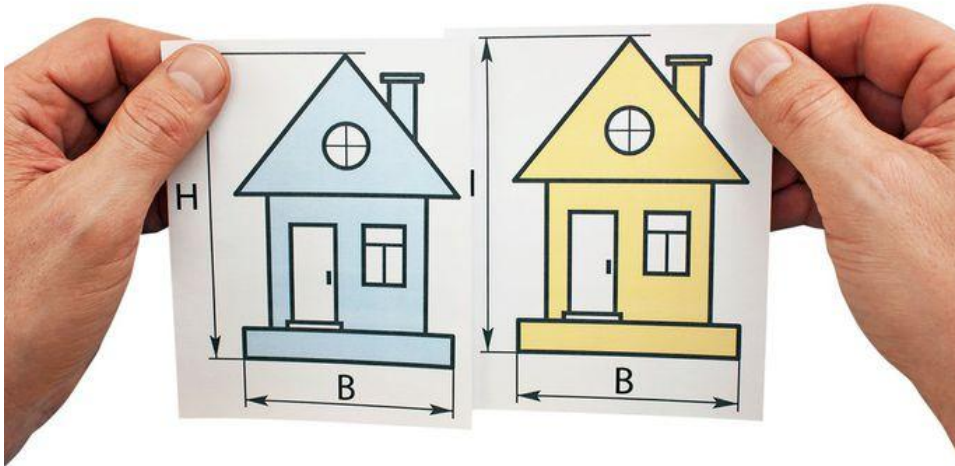
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Project 2 - Linear Regression

Metis Cohort Fall 2018

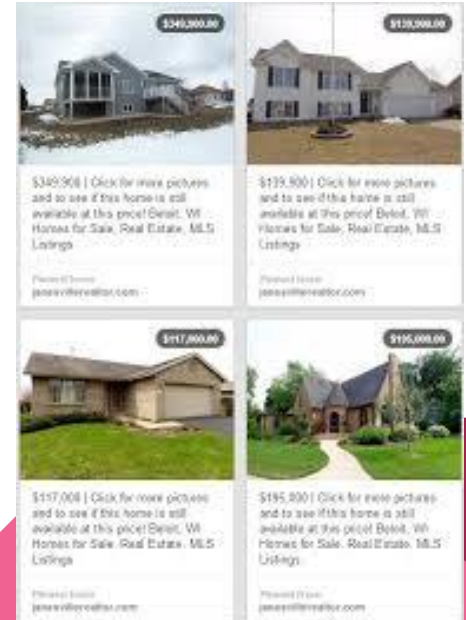
# Problem

- How much to list an apartment for?
- Traditional approach - not scientific
- Broker & Owner Disagreement



# Solution

- Use model to predict listings price based on current listings
- Broker can price apartment slightly lower or higher depending on timeline of seller



# The Data

- ~8000 current Manhattan listings from Douglas Elliman
- ~5000 used in model/ testing

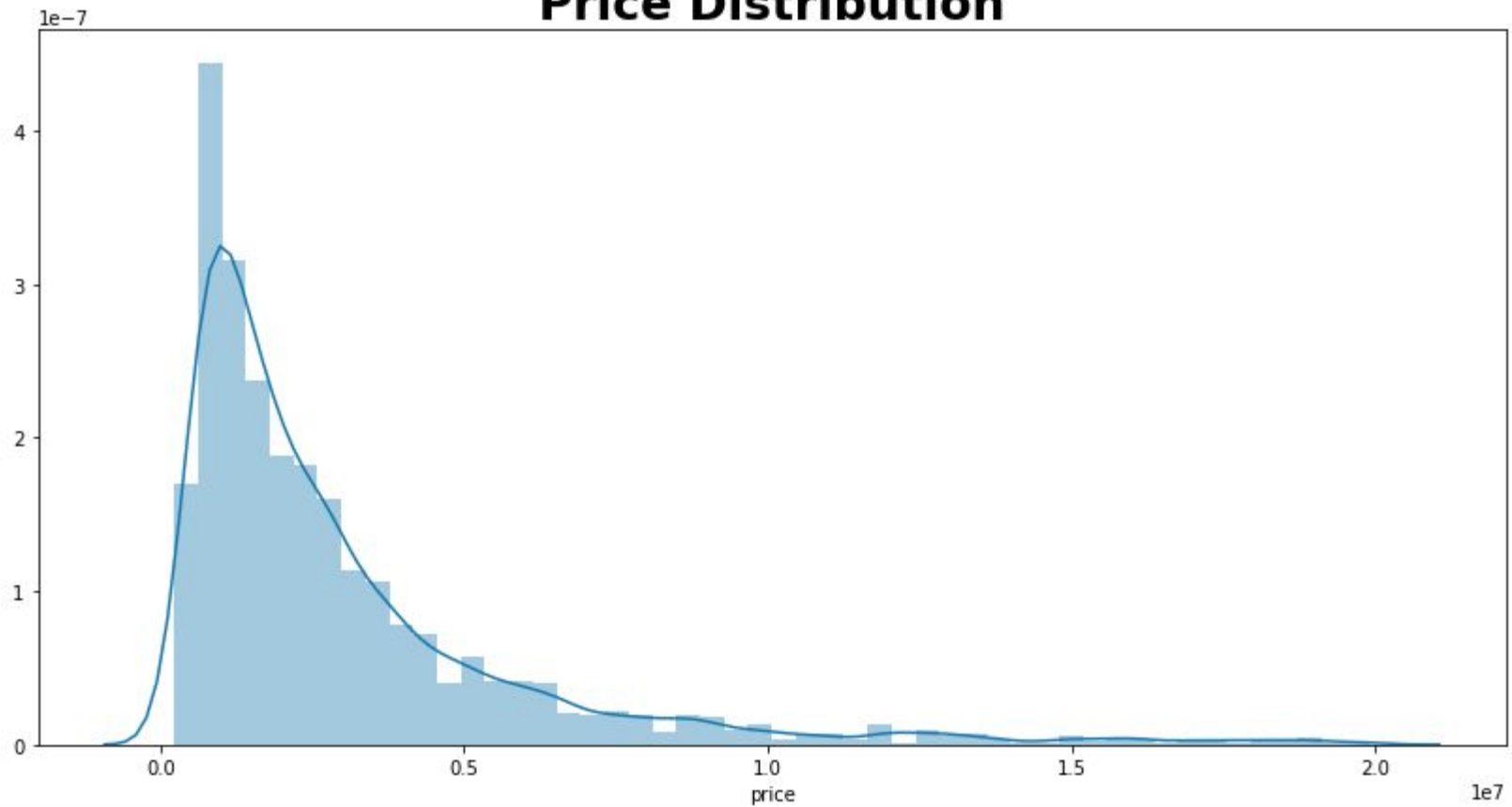


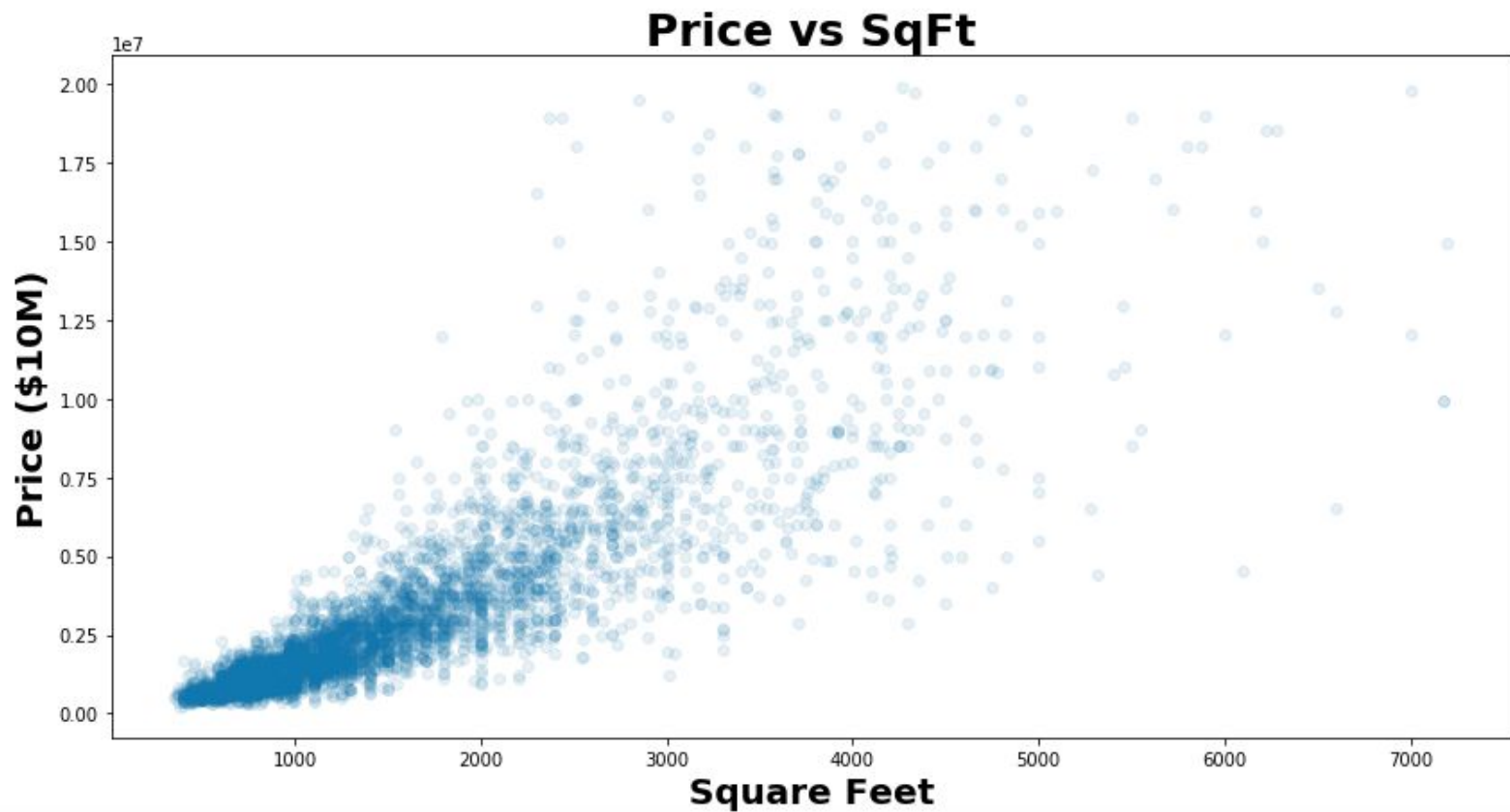
# The Features

- Square feet
- Beds
- Baths
- Monthly Fees (tax + maintenance)
- Condo or Coop?
- Special Features:
  - PH?
  - Doorman?
  - Pool?
  - Concierge?
  - Private outdoor space?

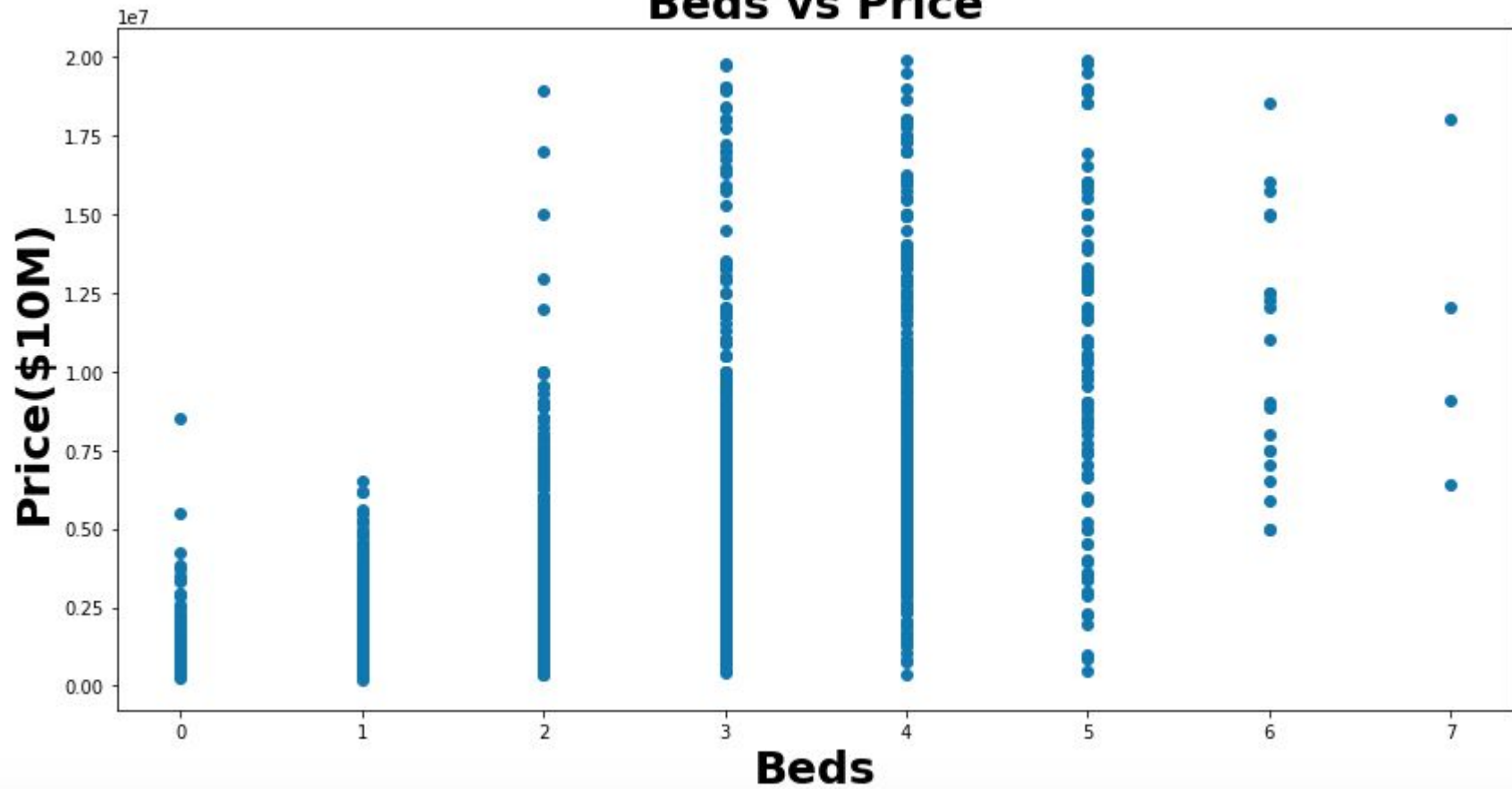


# Price Distribution



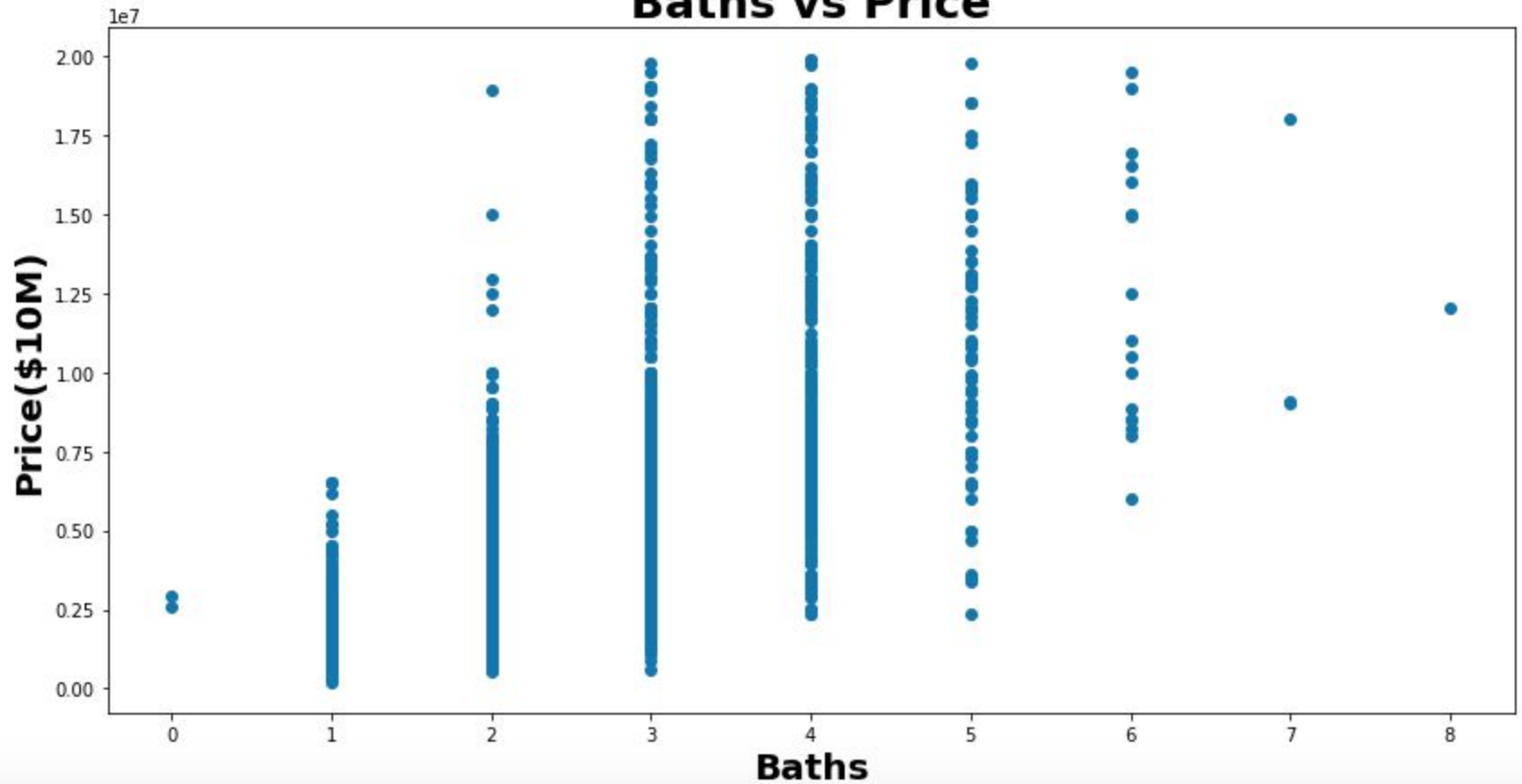


# Beds vs Price





## Baths vs Price





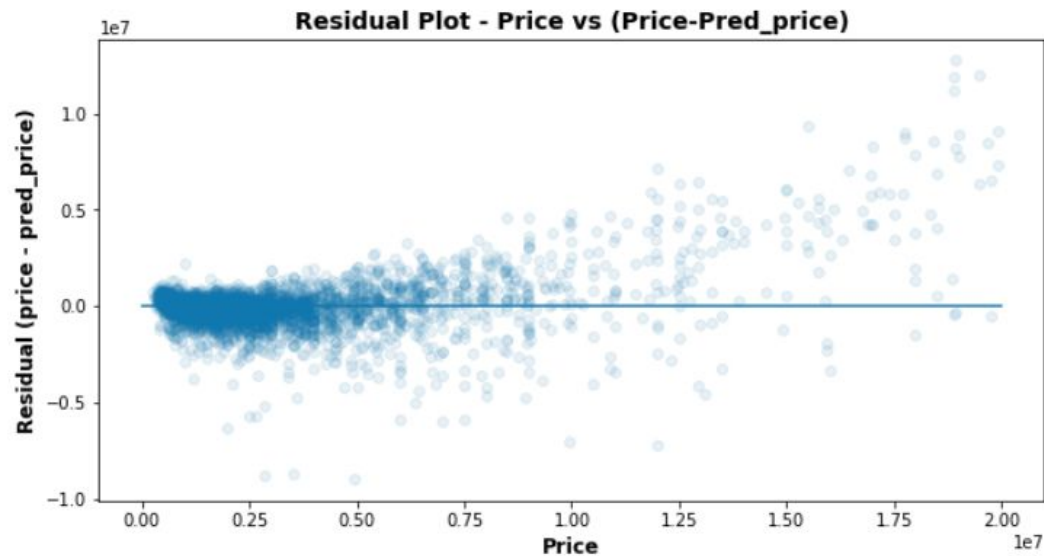
# Linear Regression Model

- Polynomial Features for non-dummy terms
- Lasso Regularization - high number of features including neighborhoods



# Results

- $R^2$ : 0.8
- Mean Absolute Error: ~\$730K



# Better Results

- Looking at data \$3 Million and less/ 2,500 sf and less
- Mean Absolute Error ~ \$420K



# Further Investigation

- More Features:
  - Floor
  - Condition
  - Year built
  - Famous Architect?
  - More amenities:
    - Gym
    - Roofdeck
    - Spa
    - Library
    - Business Center
- Sales Data



# Condition - “Super Luxury” Buildings



# Further Investigation





# Conclusion

- Scientific approach - better results when selling
- Best for use on “avg apartments” (under \$3M, under 2500sf)
- Better predictions with more features (“quality of apartment”)

