Zillow®

Housing Proposal

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Ames, Iowa

Agenda

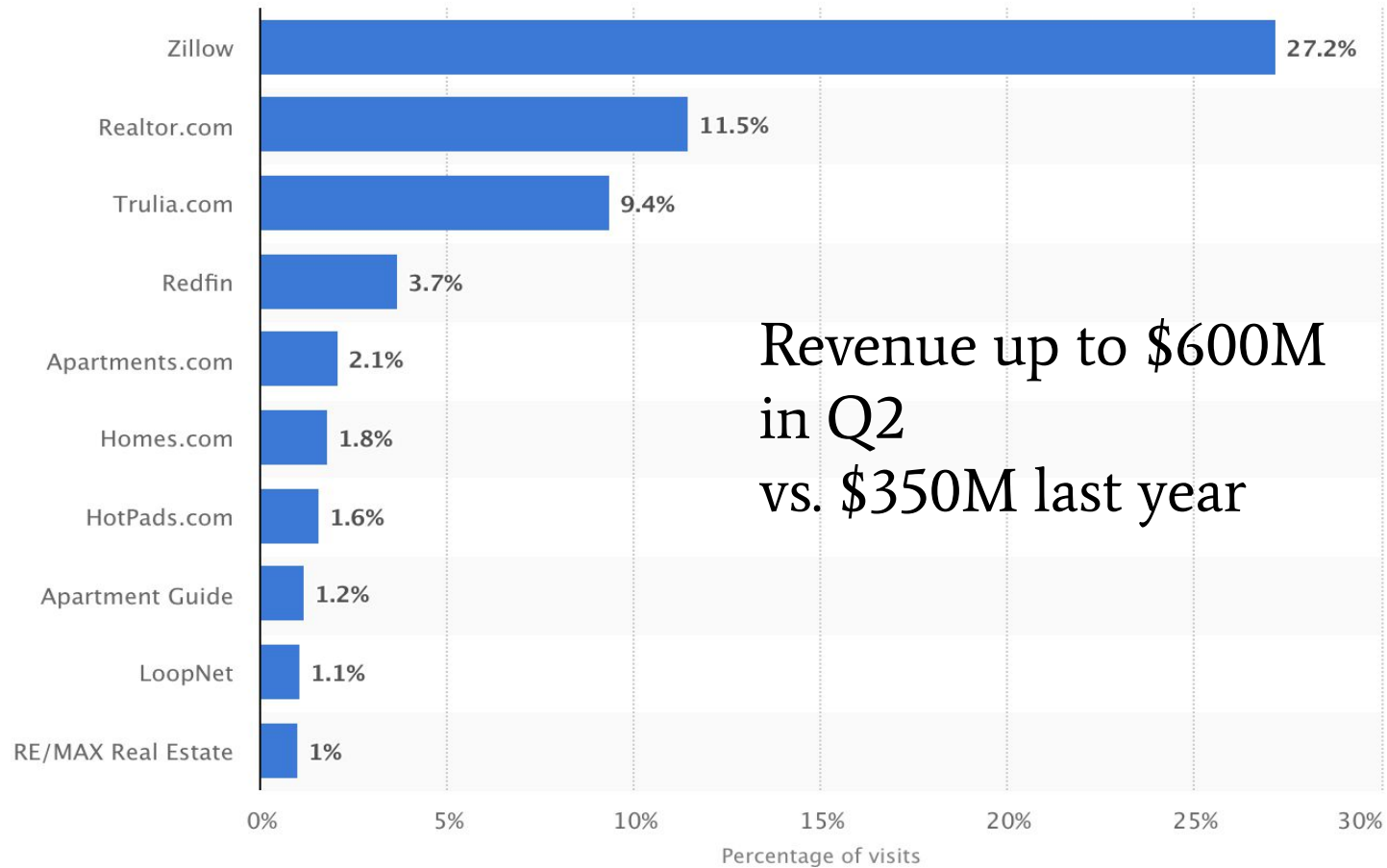| Problem Statement	• Zillow is depended upon for accurate pricing • Improving accuracy to 95% is goal
Data	• The dataset covers 71 features • Ames Iowa
Analyzing the Data	• Features that influence price more than others • Relationship of features
Results	• Were we able to achieve 95% accuracy? • What next?

Revenue up to $600M
in Q2
vs. $350M last year

| Site	Percentage of visits
Zillow	27.2%
Realtor.com	11.5%
Trulia.com	9.4%
Redfin	3.7%
Apartments.com	2.1%
Homes.com	1.8%
HotPads.com	1.6%
Apartment Guide	1.2%
LoopNet	1.1%
RE/MAX Real Estate	1%

- Net loss of $72 Million in Q2 vs $3 million last year
- Purchased 1,500 homes, and sold 786
- Any **uncertainty** in the pricing accuracy would be detrimental to Zillow's business model
- By increasing confidence in price prediction, you can secure your dominance in the marketplace.

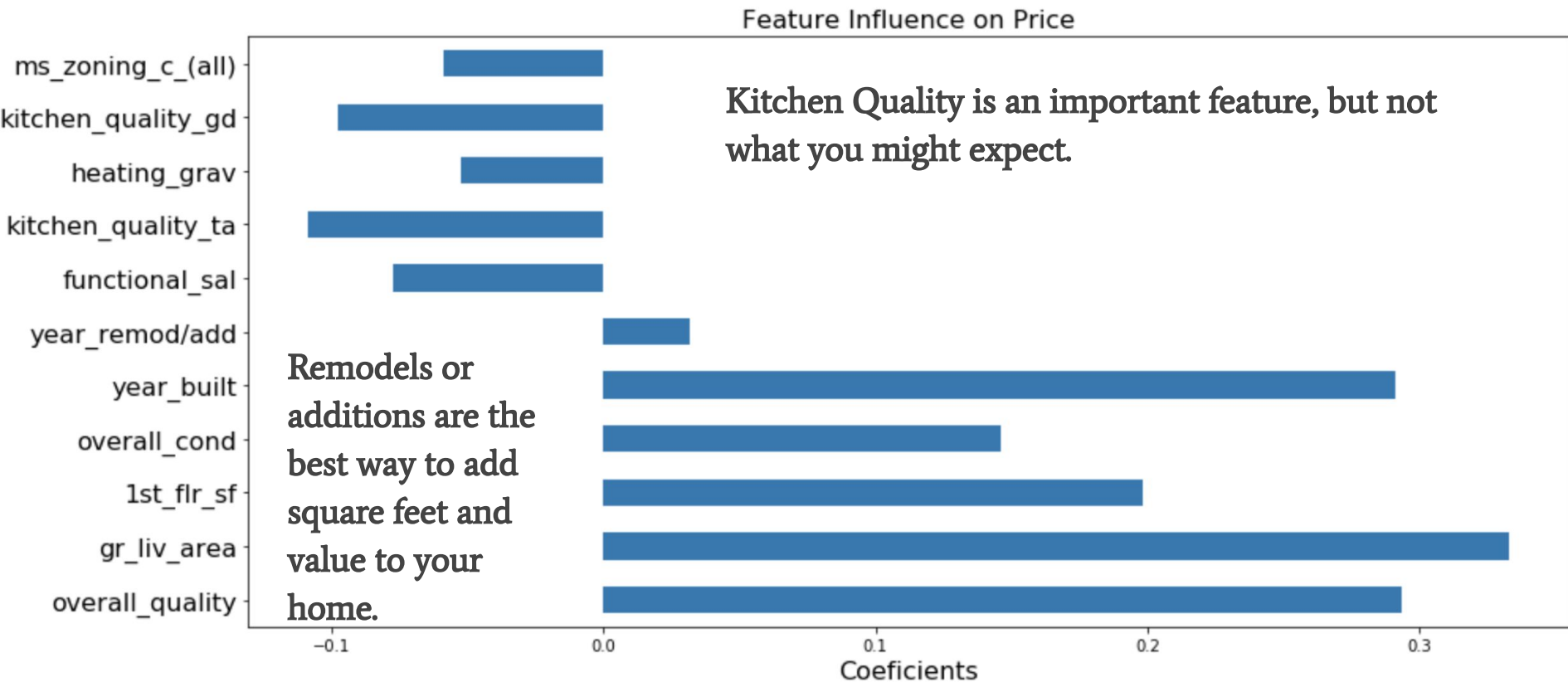| Mortgage	Homes	Agent	Rental
$27 M	$250 M	$232 M	$45 M
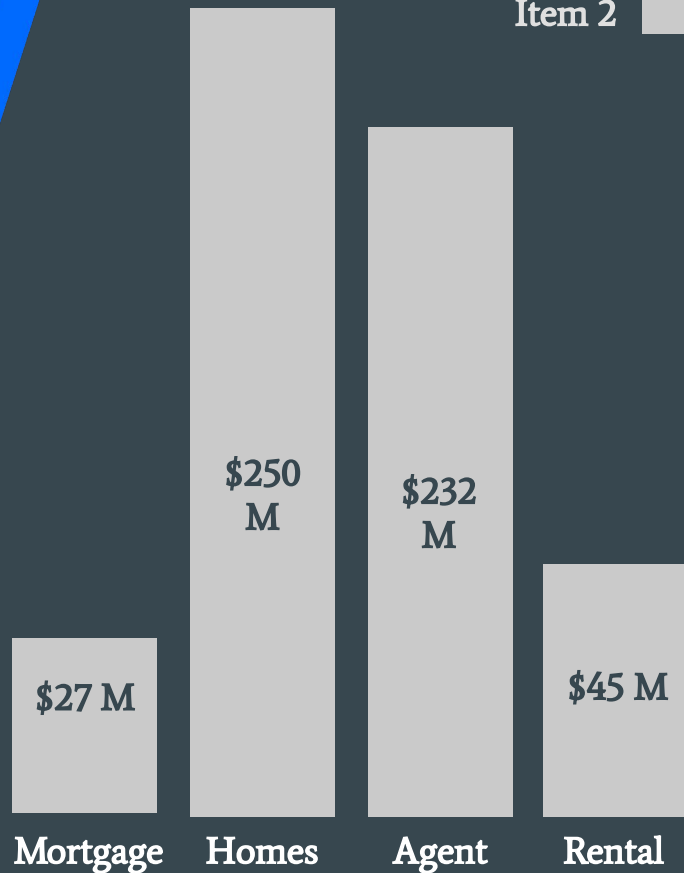
The Data
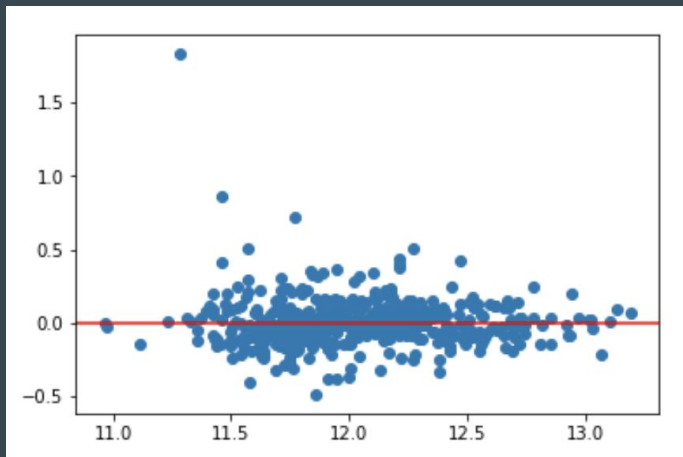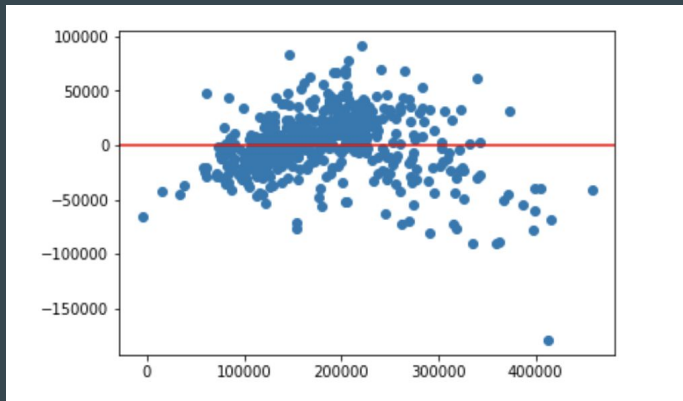
Dataset of 2930 homes in Ames Iowa with 80 features. This was taken from Ames City Assessor for homes sold 2006-2010.

Outliers:

- 2 Massive houses > 4000 SF
- Power transformed and Scaled Data to normalize distribution
- Feature Engineering using correlation, coefficients, and interactions.
- Used combination of Lasso, Ridge, and Linear Regression models to achieve the best results

Findings

Feature Influence on Price

Kitchen Quality is an important feature, but not what you might expect.

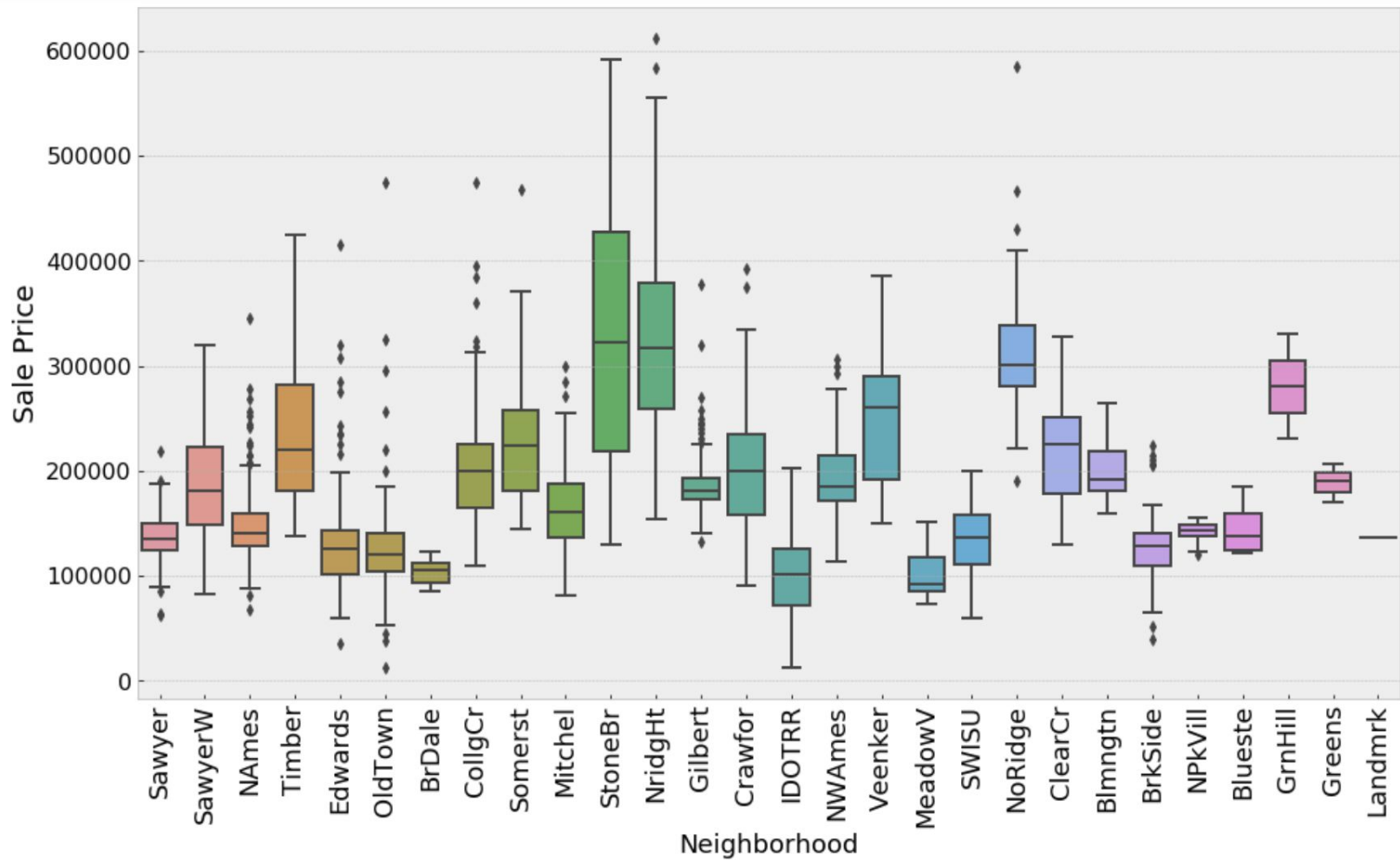Remodels or additions are the best way to add square feet and value to your home.

Gravity Furnace

- Few Mechanical Problems
- Incredibly expensive to operate
- Take up a lot of space
- Heating efficiency of 50% or lower
- Expensive to remove or upgrade.

Invest in Kitchens

Complete Kitchen Renovations, followed by kitchen upgrade are seen as adding the most value from a buyer and seller perspective.

Interior Projects

REALTOR® rank of projects' appeal to buyers (highest to lowest)	REALTOR® rank of projects' likely value to the home for resale (highest to lowest)
Complete Kitchen Renovation	Complete Kitchen Renovation
Kitchen Upgrade	Kitchen Upgrade
Bathroom Renovation	Bathroom Renovation
New Wood Flooring	Add New Bathroom
Add New Bathroom	New Master Suite / Owners' Suite
Hardwood Flooring Refinish	New Wood Flooring
New Master Suite / Owners' Suite	HVAC Replacement
HVAC Replacement	Hardwood Flooring Refinish
Basement Conversion to Living Area	Basement Conversion to Living Area
Closet Renovation	Attic Conversion to Living Area
Insulation Upgrade	Closet Renovation
Attic Conversion to Living Area	Insulation Upgrade

Results

- Modeled predictions for price were able to predict within $22,345 of a house price with 92.1% of the time.
- Highest R2 score of 94.35% but wanted to narrow feaure selsection
- Identified some undervalued properties the could be good candidates for Zillow to purchase

Next Steps

- Improve upon the data
  - Data from more diverse geographies
  - School district rating
  - Urban data
  - Specifics on remodels / additions remodeled
- Would like to add more advancements to model with random forests for improved feature selection.

Thank You!