

Aimes Iowa

Housing Predictions



BY TARA CELESTA

PROBLEM STATEMENT

TCB CONTRACTORS MARKETING STRATEGY

- TCB General Contractors is a general contracting company in Ames Iowa that oversees and executes home construction projects.
- The Board of Directors at TCB General Contractors are implementing a new marketing strategy to increase the company's revenue.
- To implement this new strategy, they want to discover which of their services are most impactful on the future value of the home.
- This information will be used to promote specific renovations in their upcoming marketing plan.
- My task is to discover the services that most dramatically increases the sales price of the home.

PROCEDURE & METHODOLOGY

- The predicted the response for my project is the variable Sale Price.
- As the output of my project is the numeric 'Sale Price', I used a linear regression modeling algorithm to evaluate the Ames Housing Dataset.
- The success of my model was evaluated by the regression metric R^2 . I used R^2 as it is easily interpretable and does not depend on the scale of "Sales Price".



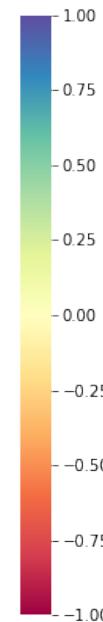
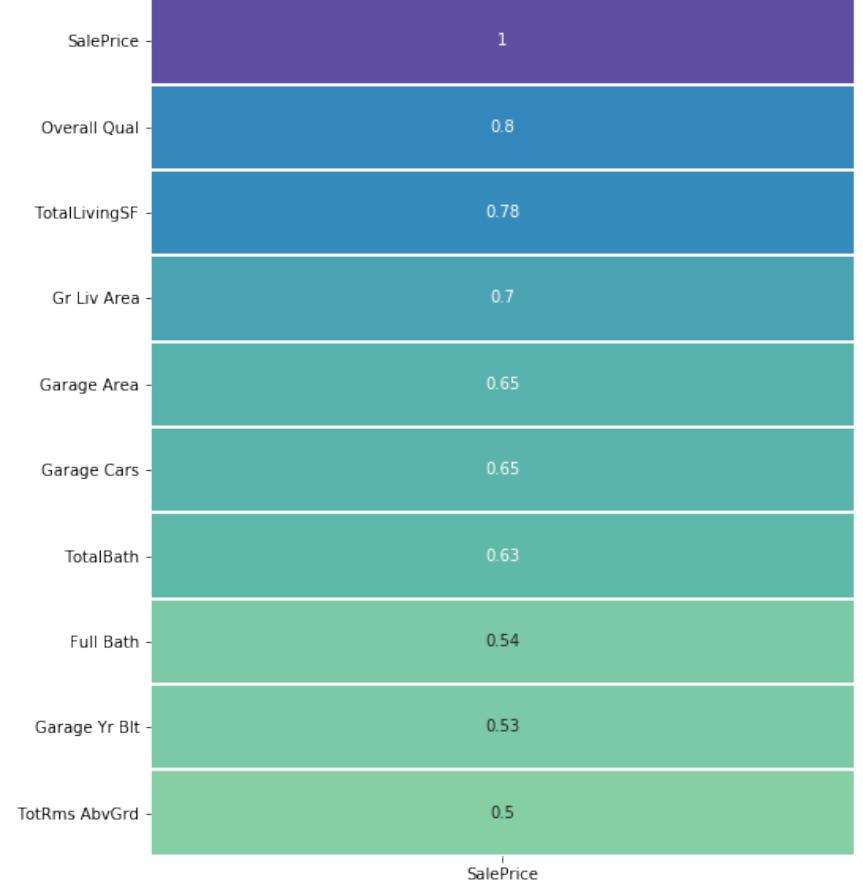
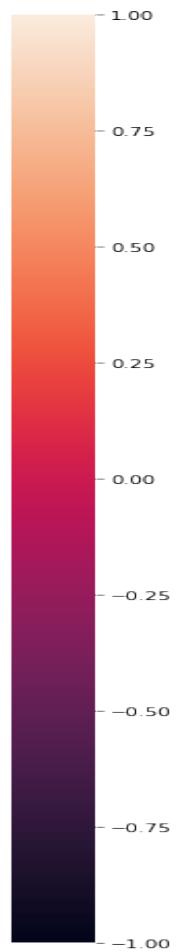
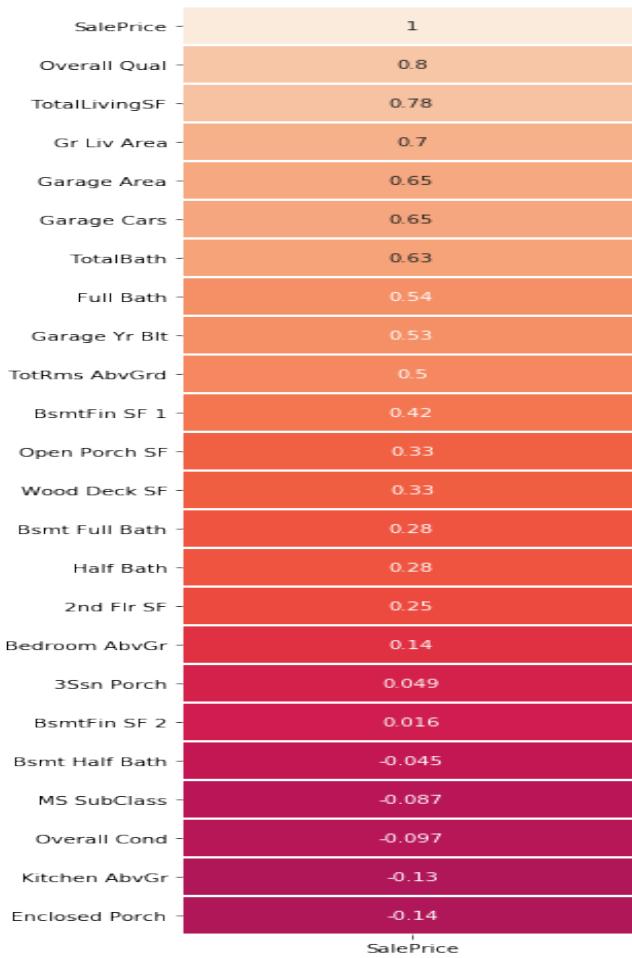
Possible Home Renovations Offered by TCB Contracting

- Complete home upgrade
- 2nd floor addition
- Basement Finish
- Kitchen Remodel
- Bathroom Addition
- Garage Addition
- Deck Addition

NARROWING FEATURES DOWN

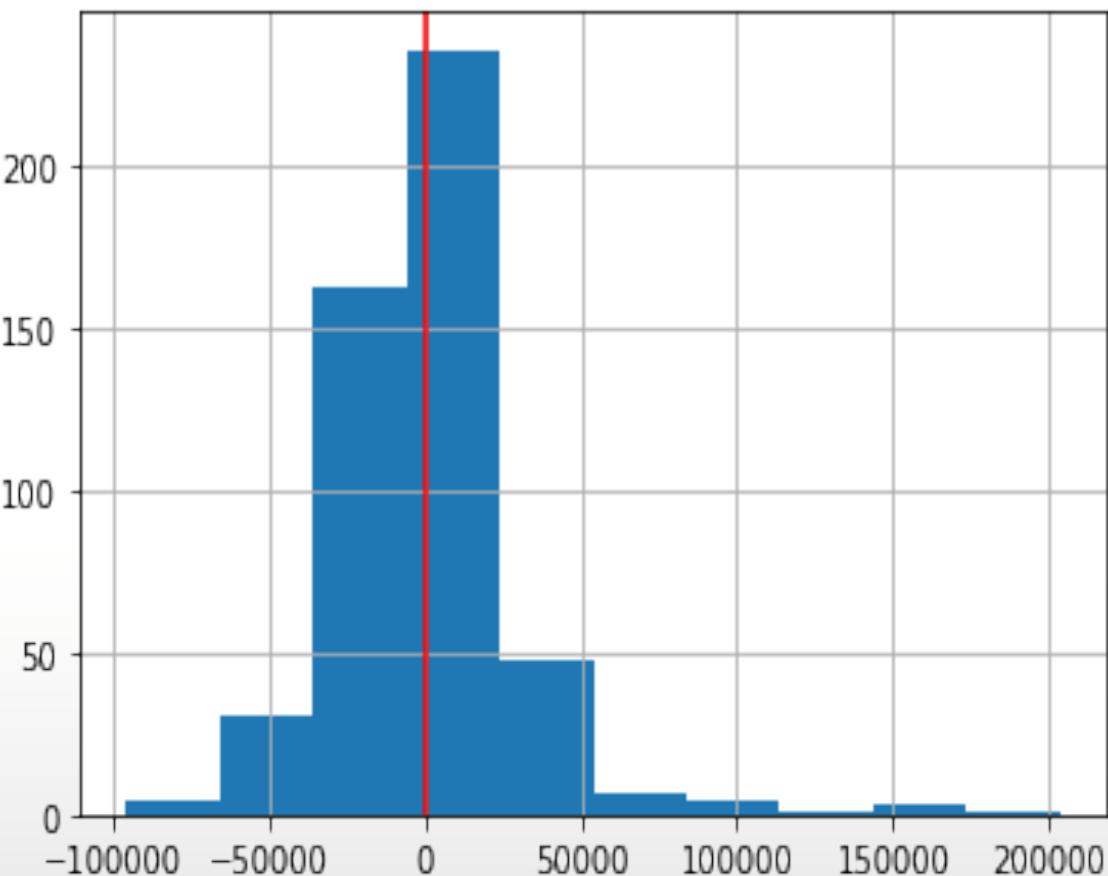
Which TCB services relate to data features?

- Complete home upgrade:
 - 'Overall Cond', 'Overall Qual'
- 2nd floor addition:
 - '2nd Flr SF', 'Bedroom AbvGr', 'MS SubClass'(060), 'House Style':(2Story)(2.5Fin), 'Gr Liv Area', 'TotRmsAbvGrd'
- Basement Finish:
 - 'Bsmt Cond', 'Bsmt Exposure', 'BsmtFin Type 1', 'BsmtFin SF 1', 'BsmtFin Type 2', 'BsmtFin SF 2',
- Kitchen Remodel:
 - 'Kitchen AbvGr', 'Kitchen Qual'
- Bathroom Addition:
 - 'Bsmt Full Bath', 'Bsmt Half Bath', 'Full Bath', 'Half Bath'
- Garage Addition:
 - 'Garage Type', 'Garage Yr Blt', 'Garage Finish', 'Garage Cars', 'Garage Area', 'Garage Qual', 'Garage Cond'
- Deck Addition:
 - 'Wood Deck SF', 'Open Porch SF', 'Enclosed Porch', '3Ssn Porch'



FINAL FEATURE SELECTION

'Overall Qual'	'MS SubClass'	'PID'	'Year Remod/Add'	"Year Built"	'Overall Cond'	'Mas Vnr Area'	'Kitchen Qual_TA'
'Kitchen Qual_Ex'	'TotalBath'	'SqFt Interaction Qual'	'Bsmt Half Bath'	'Bsmt Full Bath'	'Gr Liv Area'	'Garage Finish_Unf'	'Garage Finish_N/A'
'Garage Finish_Fin'	'Garage Type_N/A'	'Garage Type_Detchd'	'Garage Type_CarPort'	'Garage Type_BuiltIn'	'Bsmt Exposure_No'	'Bsmt Exposure_Gd'	'BsmtFin Type I_Unf'
'BsmtFin Type I_GLQ'	'BsmtFin Type 2_Unf'	"TotalLivingSF"	'Screen Porch'	"Wood Deck SF"	'Garage Area'	'Garage Cars'	'TotRms AbvGrd'
	'Kitchen AbvGr'	'Garage Cond_N/A'	'Garage Qual_N/A'	'Garage Qual_Gd'		'Fireplaces'	



Final Scores

- Train .85
- Test .87
- Cross Val .81

Residuals

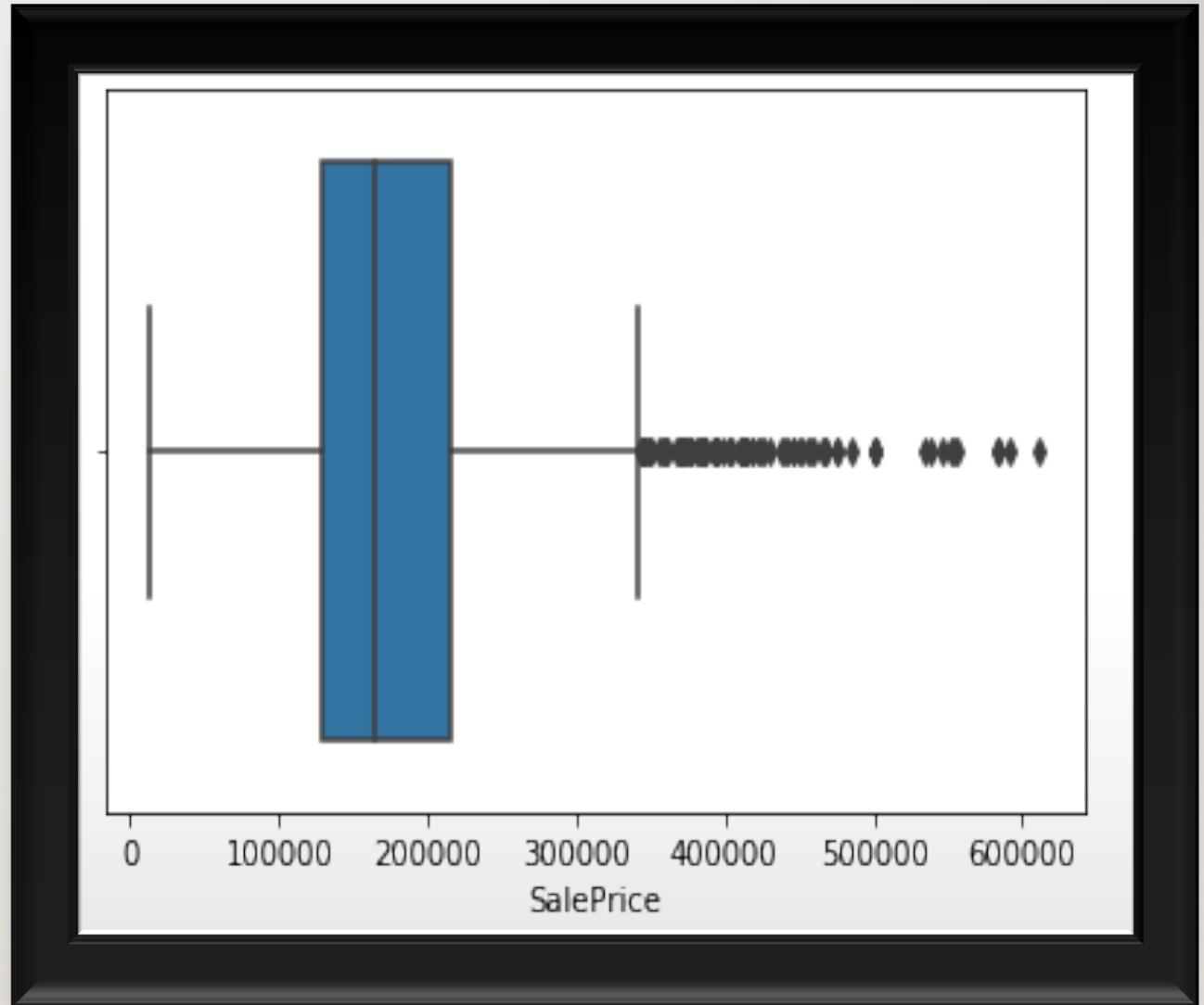
- Pretty symmetrical with a positive skew

SALES PRICE

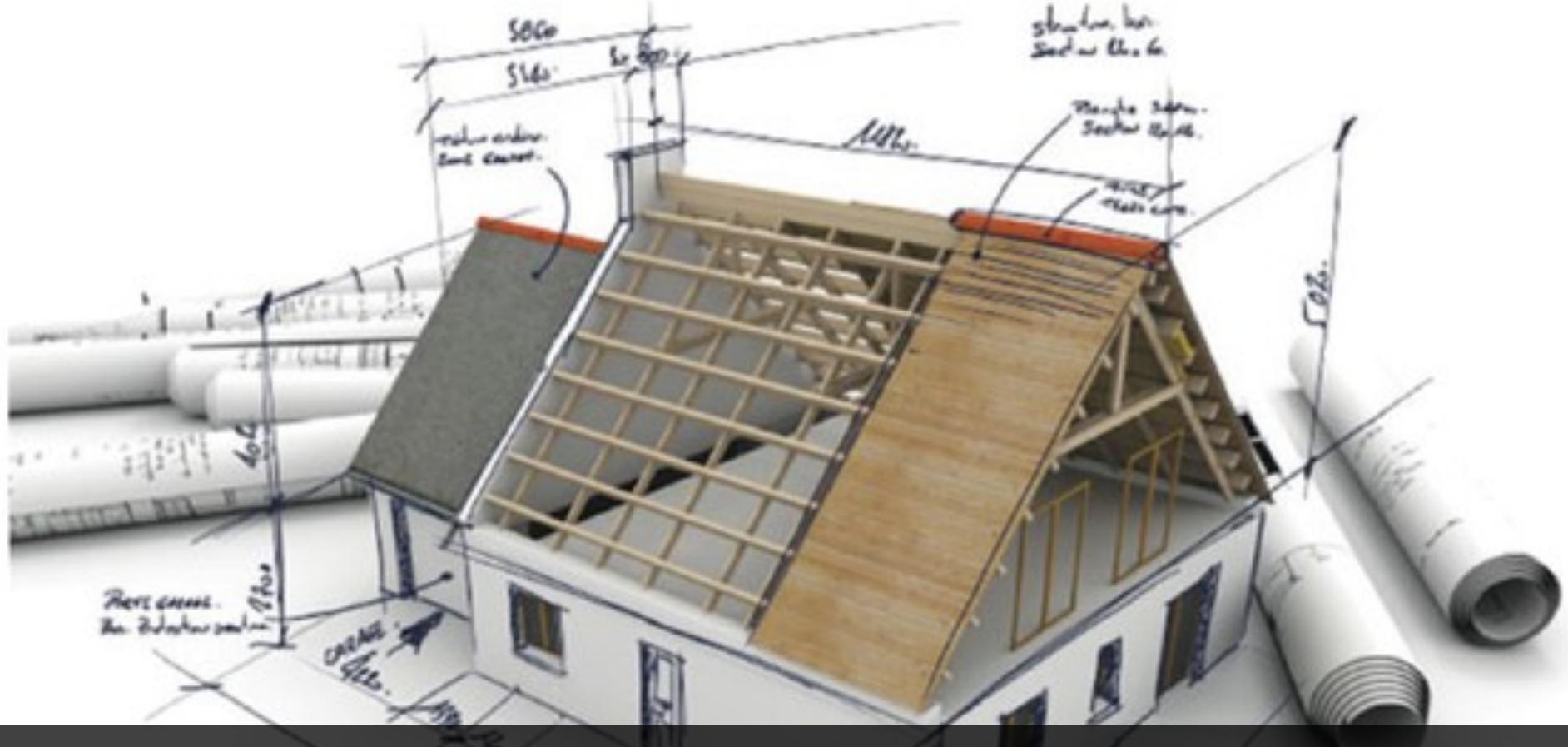
- Had many outlier that primarily contributed to the poor distribution of residuals

Logged Sales Price Scores

- Test .89
- Train .88
- Cross Val .86







TOP HIGH VALUE RENOVATIONS

KITCHEN RENOVATION +\$12,739

ABOVE GROUND ADDITIONS +\$11,083

GARAGE ADDITION +\$8,771/CAR

LOW VALUE RENOVATIONS

WOOD DECK +\$1800

BASEMENT RENOVATION +\$2523

RECOMMENDATIONS

for TCB General Contractors

- Focus new marketing campaign around kitchen renovation, above ground additions, and garage addition as they generally add the most value to a home.
- I would not focus on the addition of a wood deck or basement refinishing as the cost of these projects are more than the value added to the home.
- Given similar data I do think this model will generalize to other cities.

A close-up photograph of a white dog with brown spots, wearing a yellow construction hard hat. The dog is looking slightly to the left. The background is dark.

THANK YOU
