Regression model to predict house prices

GA DSI 22 Project 1: Tan Han Wei (John)

Overview

Part 1

Method

Part 2

Feature Selection

Part 3

Model choice and score

01

Method

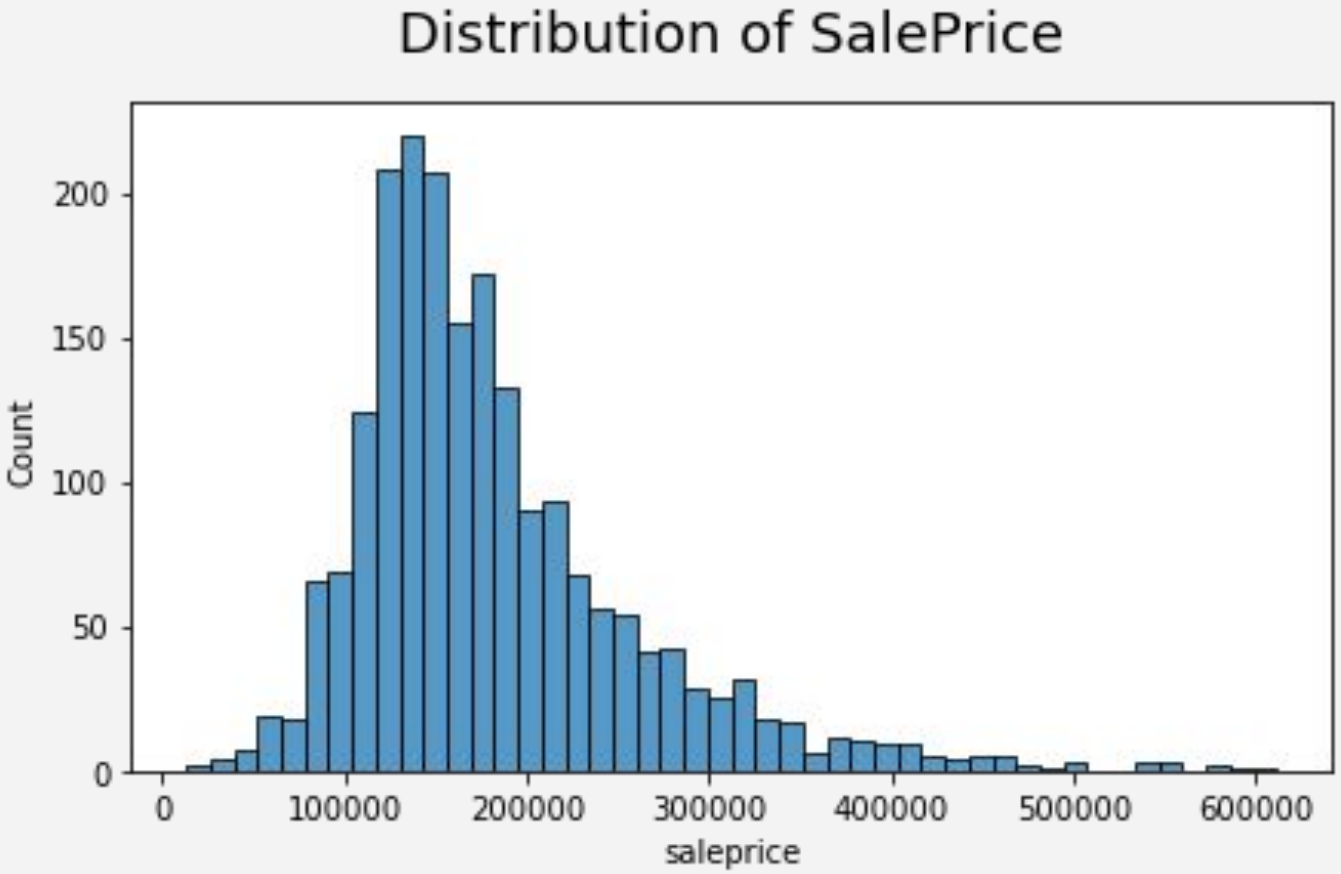
Methodology

- Feature selection and feature engineering
- Create baseline model, evaluate the score
- Use regularisation technique, evaluate score
- Repeat to improve the model

02

Feature Selection

Dependent variable - Sale Price



Feature selection

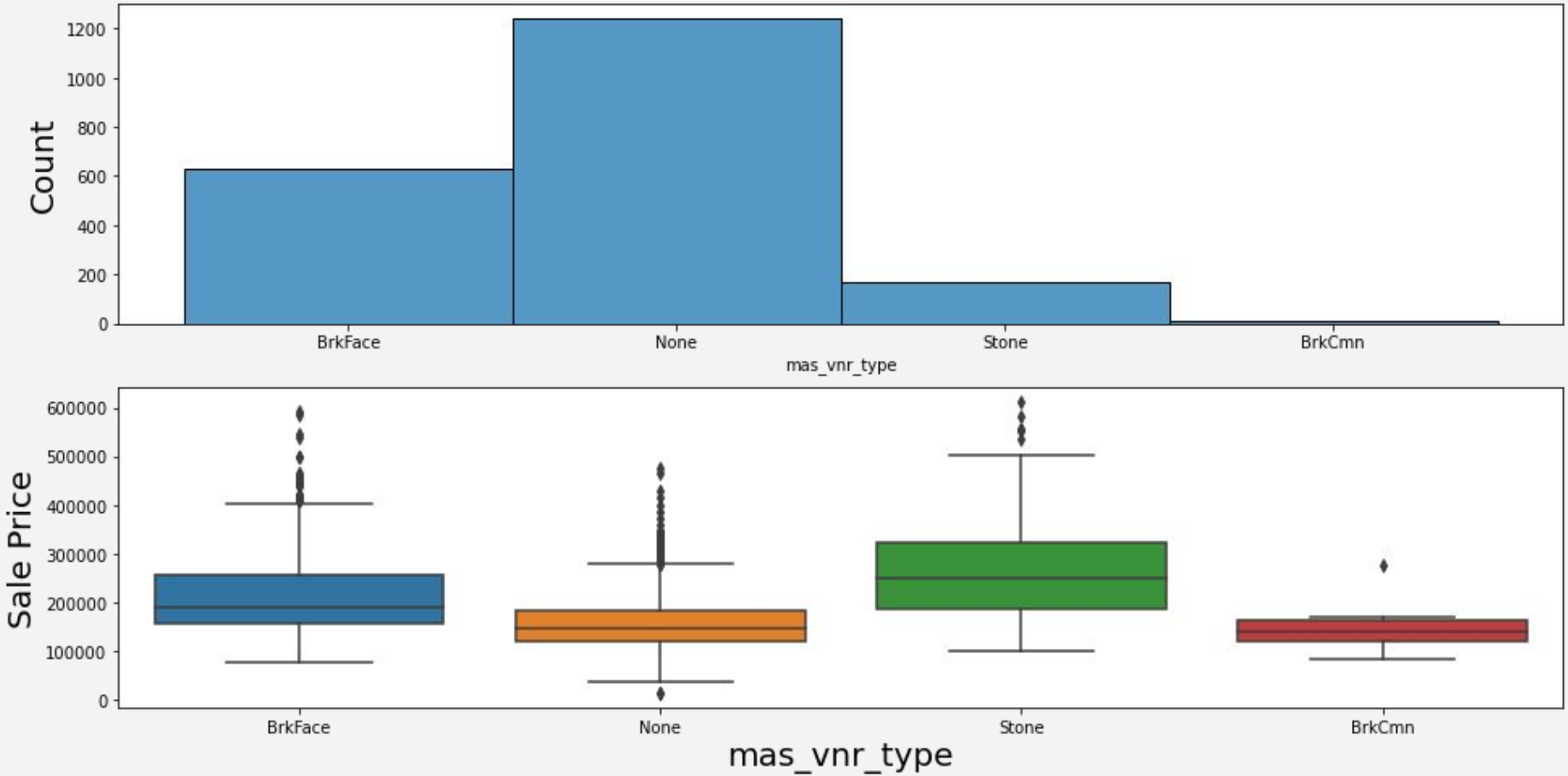
As a rule of thumb, when selecting variables for the model, there are a few factors to take note of:

1) Significant variation in the independent variable.

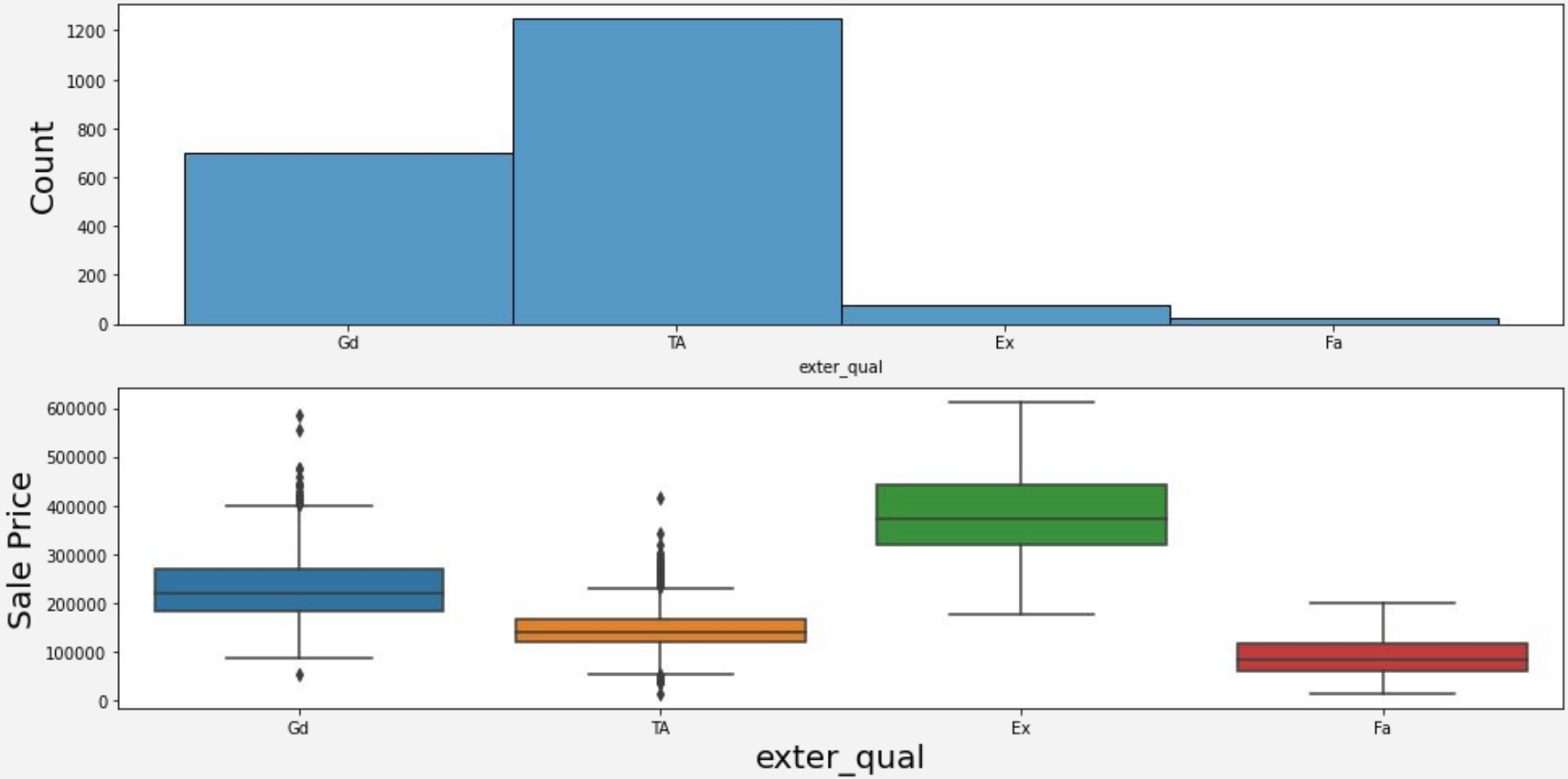
2) For numerical variables, significant correlation in the dependent variable with the independent variable

3) For categorical variables, unique characteristic between the categories

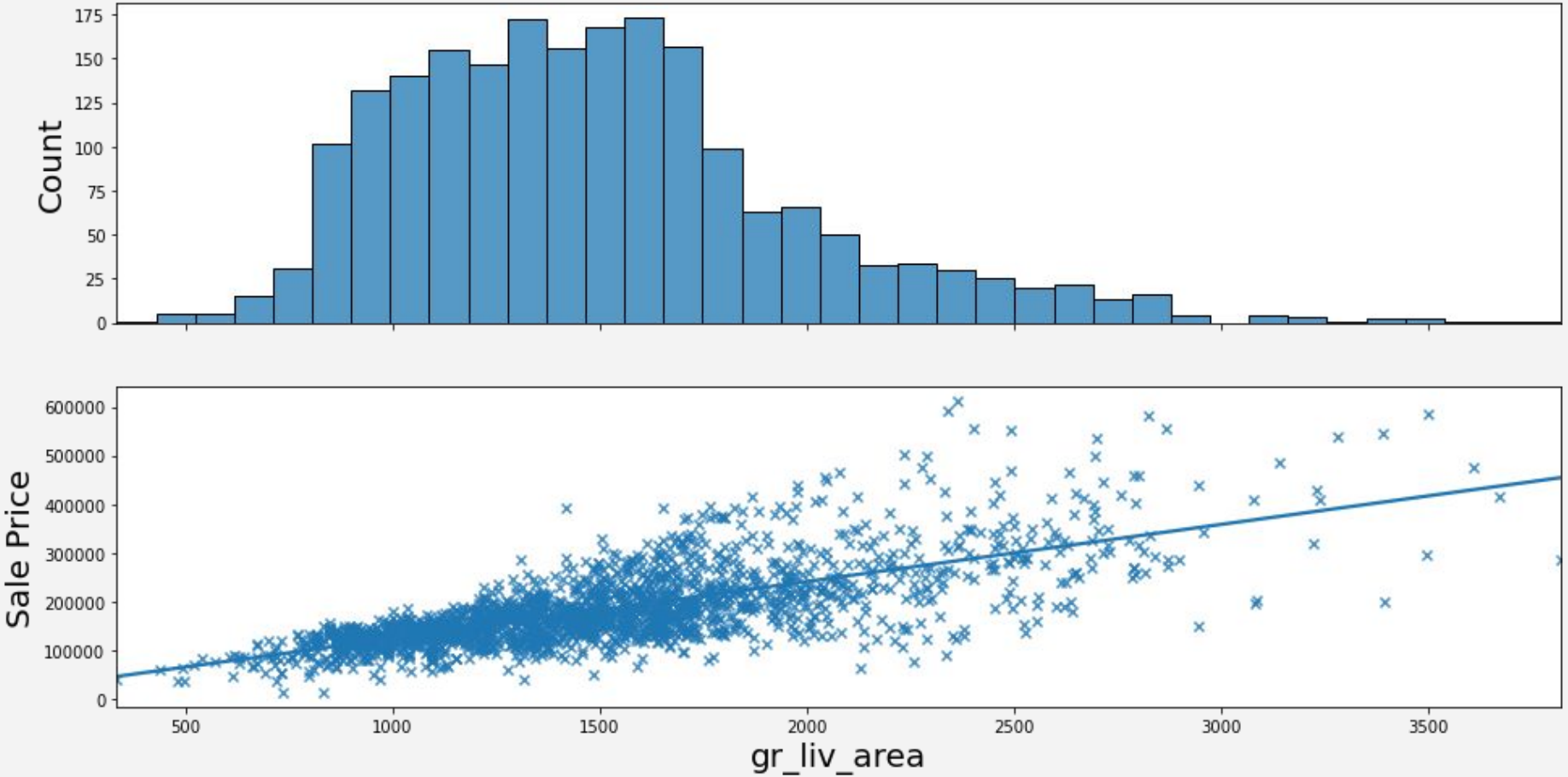
mas_vnr_type histogram & barplot with Sales price



exter_qual histogram & barplot with Sales price



gr_liv_area histogram & scatterplot with Sales price p = 0.719



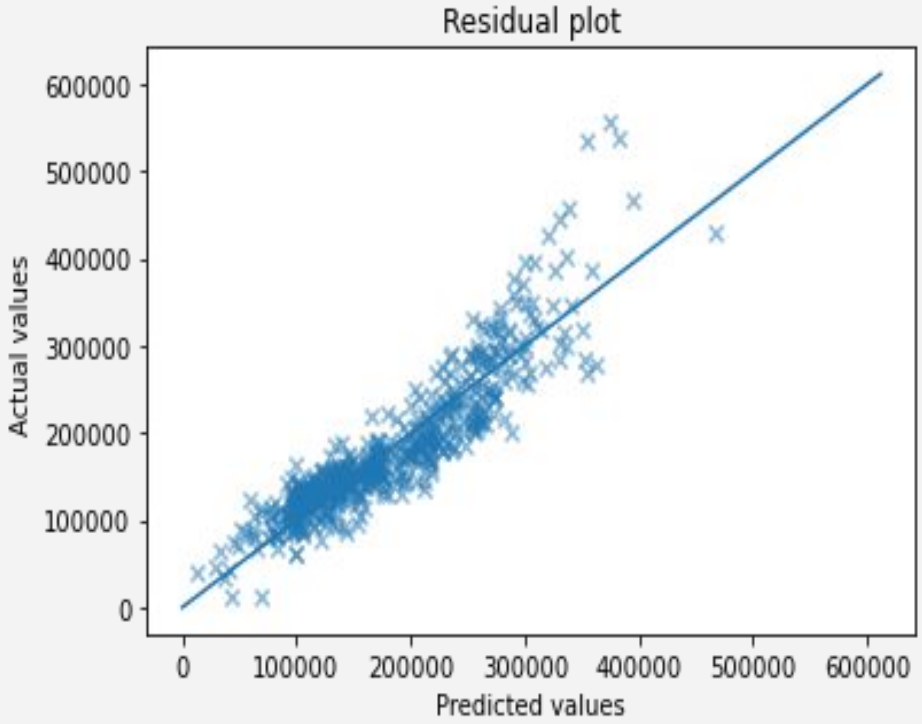
Selected features

1) 'irreg_shape'
2) 'inside_lot'
3) 'one_floor'
4) 'good_qual'
5) 'property_age'
6) 'have_mas'
7) 'good_ext'
8) 'total_bsmt_sf'
9) '1st_flr_sf'
10) '2nd_flr_sf'
11) 'gr_liv_area'
12) 'total_bath'
13) 'good_kitchen'
14) 'totrms_abvgrd'

03

Model Choice

Basic OLS with 14 features



Feature	Coefficients
irreg_shape	6058.88
inside_lot	-656.18
one_floor	-5742.70
good_qual	19247.48
property_age	-325.44
have_mas	8380.92
good_ext	13036.76
total_bsmt_sf	42.64
1st_flr_sf	48.95
2nd_flr_sf	26.81
gr_liv_area	38.84
total_bath	5700.33
good_kitchen	13794.66
totrms_abvgrd	-2541.83

Basic OLS with 14 features

OLS - RMSE 36642
Ridge - RMSE 36505
Lasso - RMSE 36423

For this basic model regularisation did not improve the model, as it does not suffer from overfitting

Overfitted model - PolynomialTransform on 14 variable

Now the regression has 120 variables

OLS - RMSE 77917.89
Ridge - RMSE 31632.67
Lasso - RMSE 31497.68

Thanks