# CPD$_P$S9

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## 1 5

The dimension is 404x450

## 2 6

lambda = .0223
In-sample RMSE= 0.1915950
Out-sample RMSE = .159

## 3 7

lambda = .11
In-sample RMSE= 0.1582139
Out-sample RMSE= 0.1469757

## 4 8

alpha = .274
lambda = .0538
In-sample RMSE= .1859432
Out-sample= .1531867
The result suggest that I should use ridge-regression, as the alpha is closer to 0 than 1.

## 5 9

The net model seems to be balanced pretty well between bias and variance. The RMSE is between both ridge and lasso, so its bias is between the two. The value of the tuning parameter also lies between both approaches, so its variance is between the two as well. This is what we're looking for when estimating y-hat, so it looks pretty good.

A simple linear model would not work because there are simply too many parameters, many of them mostly irrelevant. If we threw them all in the same regression, we'd have an R-squared of 1. This, we need parameters that trend many of them towards 0 so we only keep the relevant parameters.