Elements of Machine Learning

Assigment 2 - Problem 4

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Problem 4 (T, 1.5 + 2.5 Points). Subset selection

1

Best subset selection has the lowest RSS because it goes through every possible model with k predictors and can therefore find the best model, while the forward stepwise and the backward stepwise model don't do that. These do not go through every possible model, are therefore faster but possibly have higher RSS than the subset selection.

2

1. True. We can get the model with k+1 predictors if we take the model with k predictors and add one predictor, that is what we are doing when we use forward stepwise selection.
2. True. We can get the model with k predictors if we take the model with k+1 predictors and remove one predictor, that is what We are doing when we use backwards stepwise selection.
3. False. The models developed through forward and backward selection have no clear relation.
4. False. The models developed through forward and backward selection have no clear relation.
5. False. The model with (k+1) predictors is selected from among all potential models with (k+1) predictors, and hence still might not contain all of the predictors selected for the k-variable model.