ST790 Homework 7 Solution

1. (Classification Tree)

We use the `tree::tree` function with `split = "deviance"` to grow the tree, and use the `tree::cv.tree` function with `K = 10` to prune the tree. This procedure produces a tree with 10 leaf nodes. The training and test errors should be around 0.05 and 0.10.

2. (MARS)

We use the `earth::earth` function with `nfold = 10` and `ncross = 3` to fit the training data. If we consider an additive model, e.g. set `degree = 1`, the training and test errors should be around 0.03 and 0.04. If we consider the interaction terms, e.g. set `degree = 2`, the training and test errors should be around 0.03 and 0.06.

3. (Random Forest)

We use the `randomForest::randomForest` function with the default settings to fit the training data. The training and test errors should be around 0.00 and 0.04.

Note that we should calculate the training error using the prediction on the training data `predict(fittedObject, trainingdata)` rather than the out-of-bag prediction `predict(fittedObject)`, which gives a wrong answer of ~0.01.