**STAT 5310**

**Test #3**

**Due December 12, 2018 at 5:30pm**

1. Predict the number of applications received using the other variables in the College data set.
   1. Split the data set into a training set and a test set.
   2. Fit a linear model using least squares on the training set, and report the test error obtained.
   3. Fit a ridge regression model on the training set, with λ chosen by cross-validation. Report the test error obtained.
2. Consider the Boston housing data set, from the MASS library.
   1. Based on this data set, provide an estimate for the population mean of **medv**. Call this estimate .
   2. Provide an estimate of the standard error of . Interpret this result.

*Hint: We can compute the standard error of the sample mean by dividing the sample standard deviation by the square root of the number of observations.*

* 1. Now estimate the standard error of using the bootstrap. How does this compare to your answer from (b)?
  2. Based on your bootstrap estimate from (c), provide a 95% confidence interval for the mean of **medv**. Compare it to the results obtained using **t.test(Boston$medv)**.

*Hint: You can approximate a 95% confidence interval using the formula*