Stat 482 Homework Set #13

A body fat measurement is made for each of 20 healthy females through a cumbersome and expensive procedure requiring the immersion of the person in water. The predictor variables triceps skinfold thickness (x1), thigh circumference (x2) and midarm circumference (x3) are easier to measure. The study aims to determine the relationship between body fat (y) and the varibles x1,x2,x3. The data is available on Blackboard as a csv file.

1. Compute the standardized regression coefficients. How do standardized coefficients aid in interpretation? Which of the body measurements tell us the most about a body fat measurement? (i.e., which input variable has the largest partial effect on response.)

2. Plot the ridge regression coefficients as a function of the tuning parameter. What is the motivation behind shrinkage estimation?

3. Compute the principal regression coefficients, using the first two principal components as input variables. What is the motivation behind principal components?