STAT 8004, Homework 3

Group # ... (Replace this)
Members: ... (Replace this)

Mar. 6, 2014

This homework is due Thu., 2014/03/06, 5:30pm.

Problem 1. (60 points) Mass and Physical Measurements for Male Subjects. For his MS305 data project, Michael Larner measured the weight and various physical measurements for 22 male subjects aged 16 – 30. Subjects were randomly chosen volunteers, all in reasonable good health. Subjects were requested to slightly tense each muscle being measured to ensure measurement consistency. Apart from Mass, all measurements are in cm. The goal is to use other measurements to predict the weight. The weight model is helpful in deciding the dose for unconscious patients.

Variable	Description
Mass	Weight in kg
Fore	Maximum circumference of forearm
Bicep	Maximum circumference of bicep
Chest	Distance around chest directly under the armpits
Neck	Distance around neck, approximately halfway up
Waist	Distance around waist, approximately trouser line
Thigh	Circumference of thigh, measured halfway between the knee and the top of the leg
Calf	Maximum circumference of calf
Height	Height from top to toe
Shoulders	Distance around shoulders, measured around the peak of the shoulder blades

a). (10 points) Plot scatterplot matrix for these variables. Do you see any linear trend between the outcome and the predictors? Do you see any potential collinearity problem?

b). (10 points) Use AIC criterion and stepwise procedure to choose the submodel.

c). (10 points) Use p-value criterion and forward selection to choose the submodel. Please list your results as Table 1 in the notes for Lecture 5.

d). (10 points) Focus on the submodel chosen by p-value and forward selection. Do you see any outliers and leverage points? Among them, are there any points which could be removed

while fitting the model?

e). (10 points) Keep all points in the model. Do you observe any heterocedasiticity problem?

f). (10 points) Check the normality assumption of your model.