Tutorial Week 11 (10/10-14/10)

Tutorial Questions
This week we’ll look at One-Way and Two-Way design problems. Please refer Chapter 15 of the textbook

1. Q15.4 (p493)
2. Q15.16 and Q15.24 (p513)

Extra Practice Problems

1. Do Q15.20 (p513)
2. Do Q15.25 (p514)

Computer Exercise Week 11 : Statistical Tests - STAT2012

- Write your name, SID and the tutorial group (ie. Tuesday or Thursday) clearly.
- Refer Splus output for appropriate commands.

1. Let us consider an experimental study of drugs to relieve itching. Five drugs (N3-N7) were compared to a placebo (N2) and no drugs (N1) with 10 volunteer male subjects aged 20-30. This data is available in Splus with the name itch.c12.

(a) Inspect the data by typing itch.c12.
(b) Set a multiple graph window with 1 row and 2 columns (Using par or Graph)
(c) Obtain side by side boxplot of the data.
(d) Obtain a normal quantile plot of the combined residuals from the groups N1-N7 by using the following steps:
   i. Create a group mean vector, say g.mean, by using apply. Hint:
      > g.mean=apply(itch,2,mean)
      > g.mean
   ii. Create a matrix, say g.mat, by using matrix(), in which the matrix matches to the data matrix ”itch” and has the same group mean at each column. Hint:
      > g.mat=matrix(rep(g.mean,10),nr=10,byrow=T)
      > g.mat
   iii. Find the residual matrix of the data and then perform a normal qq-plot of the combined residuals.
(e) Comment on whether or not the data appears to satisfy the assumptions for an analysis of variance.

(f) Prepare a One-Way ANOVA table for this data. Hint:

```r
> itch=as.matrix(itch.c12)
> itch=as.vector(itch)
> fac=factor(rep(letters[1:7],c(rep(10,7))))
> itch.df=data.frame(fac,itch)
> aov.itch=aov(itch~fac,itch.df)
> summary(aov.itch)
```

(g) Comment on the results in (f). Test the null hypothesis of equality of means.

Extra Practice Problems

1. Do Q15.17 and Q15.18 (p513) using Splus.