Biostatiostics Course Report (Nobuhiro Minaka: 19 Jan 2017)

[1] "ToothGrowth" is an R data matrix on the effect of vitamin C on tooth growth in guinea pigs. The response is the length of odontoblasts (cells responsible for tooth growth) in 60 guinea pigs. Each animal received one of three dose levels of vitamin C (0.5, 1, and 2 mg/day) by one of two delivery methods, (orange juice or ascorbic acid (a form of vitamin C and coded as VC). The data frame of "ToothGrowth" is with 60 observations on 3 variables.

- Experimental design: two-factor completely randomized design
- "len": numeric Tooth length
- "supp": factor Supplement type (VC or OJ).
- "dose": numeric Dose in milligrams/day

After opening "ToothGrowth" on R Commander, go to the following questions:

Q1. Show the normality and homoscedasticity of "ToothGrowth" data.

Q2. What is the null hypothesis and the alternative hypothesis in this experiment?

Q3. Calculate the analysis of variance (ANOVA) table and execute Tukey HSD test on "dose". Show the R script and its graphic output.

Q4. What can be concluded about the factors and levels in this experiment from ANOVA and TukeyHSD test?

Q5. How about the interaction between "dose" and "supp" ?

Q6. Show the all possible linear statistical models for this experiment and calculate AICs for those models. Which model is the best one?

[2] Are there any statistical problems in your own research theme?

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Deadline - February 9 (Thu), 2017

Submission - Write your report as MS Word or pdf file, and send to me (minaka@affrc.go.jp) via e-mail with your report attached.