Math 158, Spring 2013
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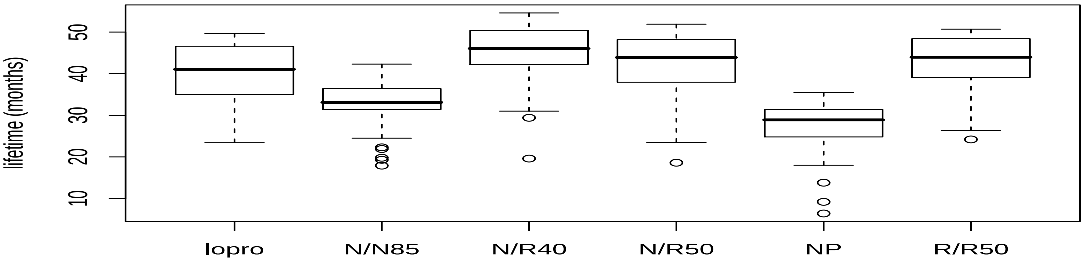
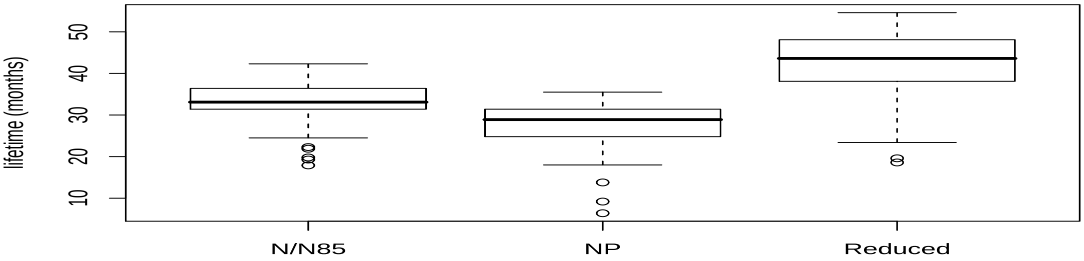
ANOVA 1 – R code
One-way ANOVA

Consider the ANOVA model from the handout on lifetimes of mice on six different diets:

$$\begin{aligned} E[Y_{ij}] &= \mu_i \\ Y_{ij} &= \text{months survived, } LIFETIME \\ i &= \text{index for which diet, } DIET \end{aligned}$$

```
> mice <- read.table("micedata.csv", header=T, sep=",")
> attach(mice)
> dim(mice)
> DIET2 <- ifelse(DIET=="NP","NP", ifelse(DIET=="N/N85","N/N85","Reduced"))

 # note that the mice data is 349 x 2 which is how we want it!
 #  (because (a) we might not have equal sample sizes, and (b)
 #  our columns should be our variables... one response, one treatment)

> boxplot(LIFETIME ~ DIET, ylab="lifetime (months)")
> boxplot(LIFETIME ~ DIET2, ylab="lifetime (months)")

> mice1.aov <- aov(LIFETIME ~ DIET)
> mice2.aov <- aov(LIFETIME ~ DIET2)

> anova(mice1.aov)
Analysis of Variance Table

Response: LIFETIME
           Df  Sum Sq Mean Sq F value    Pr(>F)
DIET        5 12733.9  2546.8  57.104 < 2.2e-16 ***
Residuals 343 15297.4    44.6

> anova(mice2.aov)
Analysis of Variance Table

Response: LIFETIME
           Df  Sum Sq Mean Sq F value    Pr(>F)
DIET2       2 11868.5  5934.3  127.04 < 2.2e-16 ***
Residuals 346 16162.8    46.7
```





```
> tapply(LIFETIME, DIET, mean)
   lopro    N/N85    N/R40    N/R50       NP    R/R50
39.68571 32.69123 45.11667 42.29718 27.40204 42.88571

> tapply(LIFETIME, DIET, sd)
   lopro    N/N85    N/R40    N/R50       NP    R/R50
6.991695 5.125297 6.703406 7.768195 6.133701 6.683152

> table(DIET)
lopro N/N85 N/R40 N/R50    NP R/R50
   56    57    60    71    49    56

> tapply(LIFETIME, DIET2, mean)
   N/N85       NP  Reduced
32.69123 27.40204 42.52716

> tapply(LIFETIME, DIET2, sd)
   N/N85       NP  Reduced
5.125297 6.133701 7.297096

> table(DIET2)
  N/N85      NP Reduced
     57      49     243
```