Statistics for laboratory scientists II

Solutions for the homework problems for lecture 4

1. Here is the R code for creating the observed table.

\[
\text{mydata} \leftarrow \text{rbind( c(17, 259), c(7, 274), c(10, 264) )}
\]

a. Code for the chi-square test.

\[
\text{chi} \leftarrow \text{chisq.test(mydata)} \\
\text{chi} \quad \# \text{ stat}=4.98; \ P\text{-value} = 0.083
\]

b. For calculating the LRT statistic and corresponding P-value, we can use the expected counts given within the results of \text{chisq.test()}. 

\[
\text{ex} \leftarrow \text{chi$expected} \quad \# \text{ expected counts} \\
\text{lrt} \leftarrow 2 \times \text{sum( mydata * log(mydata/ex) )} \quad \# \text{ value} = 4.88 \\
1 - \text{pchisq(lrt, 2)} \quad \# \text{ P-value} = 0.087
\]

c. Perform Fisher's exact test using the built-in function, \text{fisher.test()}. 

\[
\text{fisher.test(mydata)} \quad \# \text{ P-value} = 0.084
\]

d. Since the p-values are \(\sim8\%\), we would conclude that there is some evidence for a difference in the survival rates for the three treatments, but it is not strong.