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# Statistics for laboratory scientists II

## Solutions for the homework problems for lecture 3

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

```
mydata <- rbind( c(26, 63), c(29, 26))
```

a. It's best to use the built-in function `chisq.test()` to perform the chi-square test, and to use the results of this test to perform the likelihood ratio test.

```
chi <- chisq.test(mydata)
chi                                     # stat=7.00; P-value = 0.008
```

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

```
ex <- chi$expected                       # expected counts
lrt <- 2 * sum( mydata * log(mydata/ex) ) # value = 7.92
1 - pchisq(lrt, 1)                       # P-value = 0.005
```

c. Perform Fisher's exact test using the built-in function, `fisher.test()`.

```
fisher.test(mydata)                     # P-value = 0.008
```

d. We *reject* the null hypothesis and conclude that the presence of maples *is not independent* of the presence of hickories.