

This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike License](https://creativecommons.org/licenses/by-nc-sa/4.0/). Your use of this material constitutes acceptance of that license and the conditions of use of materials on this site.



Copyright 2006, The Johns Hopkins University and Karl W. Broman. All rights reserved. Use of these materials permitted only in accordance with license rights granted. Materials provided "AS IS"; no representations or warranties provided. User assumes all responsibility for use, and all liability related thereto, and must independently review all materials for accuracy and efficacy. May contain materials owned by others. User is responsible for obtaining permissions for use from third parties as needed.

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.