

Textbook Exercises

7.14, 7.17, 7.20, 7.40, 7.43, 7.47, 8.17, 8.22

Computer Exercises

For each R problem, turn in answers to questions with the written portion of the homework. Send the R code for the problem to Katherine Goode. The answers to questions in the written part should be well written, clear, and organized. The R code should be commented and well formatted.

R problem 1 The function `chisq.test()` can be used for chi-square tests. For goodness-of-fit tests, provide a single array of counts and an optional array of the same length of probabilities for each case. (R uses uniform probabilities by default.) For example, in class for the Rock, Paper, Scissors data, we had total counts of 88, 74, and 66. Here is an example.

```
chisq.test(c(88, 74, 66), p = c(1, 1, 1)/3)

##
## Chi-squared test for given probabilities
##
## data:  c(88, 74, 66)
## X-squared = 3.263, df = 2, p-value = 0.1956
```

1. Use `chisq.test()` for the data in Exercise 7.14 and compare to your previous answer.
2. Using the same data, test if the data is consistent with the null distribution $p_{rock} = 0.5$, $p_{paper} = 0.3$, $p_{scissors} = 0.2$.
3. A randomization distribution method can also be used to calculate a p-value. Add the argument `simulate.p.value=TRUE` to the call to `chisq.test()` with `B=10000` and compare answer to that in the first part.

```
chisq.test(c(66, 39, 14), simulate.p.value = TRUE, B = 10000)
```

R Problem 2 Here you will learn to use `chisq.test()` for tests of association where the counts are in matrices. Compare the answer you get with this function with the answer from your hand calculation on Exercise 7.43.

```
x = matrix(c(18, 13, 9, 16, 15, 19, 13, 34, 11, 9), nrow = 2, ncol = 5)
chisq.test(x)
```