

STAT 205 Homework 5 (Due: Monday, November 20, 2017)

Instructor: Shiwen Shen

Total Points: 60

1. Using the data in Exercise 10.2.5 in page 392 to conduct a chi-square test without direction using R. Clearly state null and alternative hypotheses, make decision with 95% confidence level, and write proper interpretation. (10)
2. Using the data in Exercise 10.5.8 in page 412 to conduct a Fisher's exact test without direction using R. Clearly state null and alternative hypotheses, make decision with 95% confidence level, and write proper interpretation. (10)
3. Exercise 10.7.3 in page 418. Use R. (10)
4. Exercise 10.9.3 and 10.9.4 in page 429. (10)
5. Laagakos and Mosteller of Harvard University fed mice different doses of red dye number 40 and recorded the time of death in weeks. Results for female mice, dosage and time of death are shown in the following table:

X1	X2	X3	X4
70	49	30	34
77	60	37	36
83	63	56	48
87	67	65	48
92	70	76	65
93	74	83	91
100	77	87	98
102	80	90	102
102	89	94	
103		97	
96			

In the table, X1=time of death for control group, X2=time of death for group with low dosage, X3=time of death for group with medium dosage, and X4=time of death for group with high dosage. (1) Use the following R code to generate a side-by-side boxplot. What can you observe?

```
x1 <- c(70,77,83,87,92,93,100,102,102,103,96)
x2 <- c(49,60,63,67,70,74,77,80,89)
x3 <- c(30,37,56,65,76,83,87,90,94,97)
x4 <- c(34,36,48,48,65,91,98,102)
boxplot(x1,x2,x3,x4)
```

- (2) Use F-test with 5% level of significance to show whether the population mean of time of death for all groups are the same. You need to state null and alternative clearly, find p-value, make decision and write proper interpretation in the context of the problem. Use R. (20)