Lab Assignment: Two-Sample t-Procedures

Your name here

Sept. ??, 2015

## Exercise 1

An experiment was conducted to evaluate the effectiveness of a drug treatment for tapeworm in the stomachs of sheep. A random sample of 24 worm-infected lambs of approximately the same age was divided into two groups. Twelve of the lambs were injected with the drug and the remaining twelve were left untreated. After a 6-month period the lambs were slaughtered and the worm counts recorded.

### Part 1a

Load the data set WormSheep.rda

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1a -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 1b

Create boxplots and histograms for each group (treated vs. untreated). Be sure that each plot is labeled appropriately.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1b -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 1c

Do the boxplots show any outliers?

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1c -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 1d

Describe the shapes of the histograms for the sample data for each sample.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1d -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 1e

Conduct an appropriate test to determine if the worm counts in each population can be considered as normally distributed. Provide the p-value and the conclusion of the test.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1e -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 1f

Conduct an appropriate test to determine if the worm counts in each population can be considered to have equal variances. Provide the p-value and the conclusion of the test.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1f -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 1g

Conduct the test of your choice to compare the population mean worm count for all sheep treated with the drug to the mean worm count for the population of untreated sheep. Let .

#### Step 1

Define the parameters in words in the context of the problem.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 1g.step1 -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

#### Step 2

State the null and alternative hypotheses for the test.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 1g.step2 -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

#### Step 3

Use R to generate the output for the test you selected.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 1g.step3 -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

#### Step 4

State both a statistical conclusion at and interpret it in the context of the problem.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 1g.step4 -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 1h

Write an interpretation in the context of the problem for the 95% CI.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1h -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 1i

Did you use the separate-variance t-procedures or the pooled t-procedures? Justify your choice, including some discussion of how well the conditions for the hypothesis test and confidence interval procedures were met.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 1i -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

## Exercise 2

Data was collected for a sample of college students at a university in the Midwest. One variable measured was the number of words per minute that they could type and also whether or not they had previously taken a typing course (Method 1) or if they were self-taught (Method 2).

### Part 2a

Load the data typing.rda

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2a -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 2b

Create boxplots and histograms for each group (previous typing class vs. self-taught). Be sure that each plot is labeled appropriately.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2b -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 2c

Do the boxplots show any outliers?

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2c -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 2d

Describe the shapes of the histograms for the sample data for each sample.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2d -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 2e

Conduct an appropriate test to determine if the typing speed in each population can be considered as normally distributed. Provide the p-value and the conclusion of the test.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2e -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 2f

Conduct an appropriate test to determine if the typing speed in each population can be considered to have equal variances. Provide the p-value and the conclusion of the test.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2f -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

### Part 2g

Conduct the test of your choice to test that the population mean typing speed for all college students with a previous course in typing is higher than for those who were self-taught. Let .

#### Step 1

Define the parameters in words in the context of the problem.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 2g.step1 -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

#### Step 2

State the null and alternative hypotheses for the test.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 2g.step2 -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

#### Step 3

Use R to generate the output for the test you selected.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 2g.step3 -|-|-|-|-|-|-|-|-|-|-|-

# Insert your R code here.

#### Step 4

State both a statistical conclusion at and interpret it in the context of the problem.

#### -|-|-|-|-|-|-|-|-|-|-|- Answer 2g.step4 -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 2h

Write an interpretation in the context of the problem for a 90% confidence interval.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2h -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.

### Part 2i

Did you use the separate-variance t-procedures or the pooled t-procedures? Justify your choice, including some discussion of how well the conditions for the hypothesis test and confidence interval procedures were met.

### -|-|-|-|-|-|-|-|-|-|-|- Answer 2i -|-|-|-|-|-|-|-|-|-|-|-

Replace this text with your answer here.