**Book Homework Session7**

**9.13**

A. U= 14.6

U does not equal14.6

B. The type 1 error is when the test states that the mean of the numbers of hours studied by students is not 14.6 hours when it really is 14.6.

C. The type 2 error is when the test states that the mean of the numbers of hours studied by students is 14.6 hours when it really is not.

**9.15**

1. U= 1

U does not equal 1

Z= .995 -1 / .02 sqrt50 = -1.77

Because Z= -1.77 it falls in the range of +-2.58 so there is no evidence to reject H= 1 gallon

1. P= 2(.0384) = .0768

.0768 is the probability of getting a mean that does not fall within the hypothesized population mean range.

C. 0.995 +- 2.58 (.02 / SQRT50)

.99<= U <= 1.0023

D. They both confirm the hypothesized population mean

**9.22**

A. H0: μ = 3.7

H1: μ ≠3.7

Rejection region: tstat <-1.9983 or tstat > 1.9983

tstat = (3.57 – 3.7)/(.8/√64)

tstat = -.13/.1

tstat = -1.3

The tstat test statistic falls in the non-rejection region, so there is not enough evidence to state that the mean waiting time is not 3.7 minutes.

B. The sample size is over 30 so the shape is thought to be distributed normally.

**9.31**

A. T= -00023/(.0017/sqrt 100) = -1.36

Since T is less than 1.98 you do not have enough evidence to reject the mean difference is

0.0 inches

1. X= -00023 +- 1.9842

-.000567 <= U <= .000107

There is a 95% chance that the mean difference is between -.000567 and .000107

1. A and B suggest that you do not reject the hypothesis
2. For the t test to be valid, the data should to be independently drawn from a population that is normally distributed. Since the sample size is 100 the t distribution will be a good estimate of the sample distribution of the mean as long as the population distribution is not skewed.

**9.53**

A. Ho: π = .46

H1: π ≠ .46

Zstat = (.483 - .46)/√(((.46)(1 - .46))/60)

Zstat = .023/√(.2484/60)

Zstat = .023/.064

Zstat = .36

p-value = (1 - .6406)(2)

p-value = .7188

The p-value is greater than the level of significance, so we do not reject the null

hypothesis.

1. p = .6

Zstat = (.6 - .46)/(.064)

Zstat = .14/.064

Zstat = 2.19

p-value = (1 - .9857)(2)

p-value = .0286

The p-value is less than the level of significance, so we reject the null

hypothesis.

**10.9**

A. (2.214- 2.012) / SQRT 3.27 (.05) (.05)

T=.35

Does not fall in rejection region so you can not reject null hypothesis

B. P= 1- .63 \* 2

P= .73

P is greater than the level of significance, so we do not reject

1. Assume that the populations are evenly distributed

D). (2.214- 2.012) +- 2.024 / SQRT 3.27(.5).5

-.96 <= U <= 1.36

Here is a 95% chance that the mean time is between -.96 and 1.36

**10.24**

|  |  |  |  |
| --- | --- | --- | --- |
| Patient | Before | After | Di |
| 1 | 158 | 284 | -126 |
| 2 | 189 | 214 | -25 |
| 3 | 202 | 101 | 101 |
| 4 | 353 | 227 | 126 |
| 5 | 416 | 290 | 126 |
| 6 | 426 | 176 | 250 |
| 7 | 441 | 290 | 151 |

∑Di = 603

D-bar = 603/7

D-bar = 86.143

SD = 123.7

H0: μD = 0

H1: μD ≠ 0

A. tstat = (86.143 – 0)/(123.7/√(7))

tstat = 86.143/46.754

tstat = 1.842

Rejection Region:

tstat > 2.4469 or tstat < -2.4469

The tstat test statistic does not fall within the rejection region, so we do not reject the null hypothesis.

B. p-value = (1- .9671)(2)

p-value = .0658

The p-value is greater than the .05 level of significance, so we do not reject the null hypothesis.

C. 86.143 ± (2.4469)(123.7/√(7))

86.143 ± (2.4469)(46.754)

86.143 ± 114.402

-28.259 ≤ μD ≤ 200.545

There is a 95% chance that the mean difference in bone marrow micro vessel density before and after the stem cell transplant is between -28.259 and 200.545. Since zero is included, we do not

reject the null hypothesis.

1. Assume that the population distribution is normal then perform a paired t-test for the mean of two related populations.

**10.39**

Fstat = 161.9/133.7

Fstat = 1.21