**Week 12**

T test for single mean

1. The 9 items of a sample have the following values 45, 47, 50, 52, 48, 47, 49, 53, 51. Does the mean of these values differ significantly from the assumed mean 47.57?

Input:

x=c(45,47,50,52,48,47,49,53,51)

a=t.test(x,alternative = "two.sided",mu=47.57,confint=0.95)

a

Output:

> x=c(45,47,50,52,48,47,49,53,51)

> a=t.test(x,alternative = "two.sided",mu=47.57,confint=0.95)

> a

One Sample t-test

data: x

t = 1.7651, df = 8, p-value = 0.1156

alternative hypothesis: true mean is not equal to 47.57

95 percent confidence interval:

47.09768 51.12454

sample estimates:

mean of x

49.11111

Inference:|t|<t alpha thus ho is true

T test for difference of mean

2. the height of 6 randomly chosen sailors are in inches are 63,65,68,69,71,72. These of 9 randomly chosen soldiers are61,62,65,66,69,70,71,72 and 73. Thest whether the sailors are on average taller than soldier

Input:

sailor=c(63,65,68,69,71,72)

soldier=c(61,62,65,66,69,70,71,72,73)

td=t.test(sailor,soldier,var.equal = TRUE,aalternative = "greater",paired = FALSE)

td

Output:

> sailor=c(63,65,68,69,71,72)

> soldier=c(61,62,65,66,69,70,71,72,73)

> td=t.test(sailor,soldier,var.equal = TRUE,aalternative = "greater",paired = FALSE)

> td

Two Sample t-test

data: sailor and soldier

t = 0.15662, df = 13, p-value = 0.878

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

-4.264708 4.931375

sample estimates:

mean of x mean of y

68.00000 67.66667

Inference:|t|<t alpha thus ho is true

F test

3.

Two random sample have the following values:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample 1 | 15 | 22 | 28 | 26 | 18 | 17 | 29 | 21 | 24 |
| Sample 2 | 8 | 12 | 9 | 16 | 15 | 10 |  |  |  |

Test the difference of the estimates of the population variances at 5% level of significance

Input:

s1=c(15,22,28,26,18,17,29,21,24)

s2=c(8,12,9,16,15,10)

var.test(s1,s2)

Output:

> s1=c(15,22,28,26,18,17,29,21,24)

> s2=c(8,12,9,16,15,10)

> var.test(s1,s2)

F test to compare two variances

data: s1 and s2

F = 2.2917, num df = 8, denom df = 5, p-value = 0.3762

alternative hypothesis: true ratio of variances is not equal to 1

95 percent confidence interval:

0.3391458 11.0395898

sample estimates:

ratio of variances

2.291667

Inference: |F|<F alpha thereby h0 is true

4. Two sample of sodium vapour bulbs were tested for length of life and the following results were got

|  |  |  |  |
| --- | --- | --- | --- |
|  | Size | Sample mean | Sample SD |
| Type1 | 8 | 1234 | 36 |
| Type2 | 7 | 1036 | 40 |

Assumption : There is no difference in the mean life of the two bulbs.

Code:

zsum.test(mean.x=1234,sigma.x = 36,n.=8,mean.y = 1036,sigma.y = 40,n.y=7,alternative = "two.sided",mu=0,conf.level = 0.95)

Output:

> zsum.test(mean.x=1234,sigma.x = 36,n.=8,mean.y = 1036,sigma.y = 40,n.y=7,alternative = "two.sided",mu=0,conf.level = 0.95)

Two-sample z-Test

data: Summarized x and y

z = 10.019, p-value < 2.2e-16

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

159.2655 236.7345

sample estimates:

mean of x mean of y

1234 1036

Inference: |Z|>z alpha therefore H0 is false and there is significant difference in the life of the bulbs.

Result:  
The respective tests were successfully conducted and the hypothesis were successfully cross checked and verified.