Tut 6 - R3 : Sampling Theory

INSTRUCTION :Create a word file of R3 using the following

|  |  |  |
| --- | --- | --- |
| Steps | Details | Marks (25) |
| 1 (on the top of page) | Name: Aarya Tiwari  Batch :B2  Roll no:16010421119  Tut6-R3 : Sampling Theory-CO3  Date:13/4/23 |  |
| 2 | File name  R3-RollNo-Batch no\_Name  Eg.  R1-16010421001-A1-TANUSHREE ACHARYA | 1 |
| 3 | Question 1 CODERstudio Screen shot (print screen of all4 windows together) **Answer** | 1  2  2  2 |
| 4 | Question 2 CODERstudio Screen shot (print screen of all4 windows together) **Answer** | 1  2  2  2 |
| 5 | Question 3 CODERstudio Screen shot (print screen of all4 windows together) **Answer** | 1  2  2  2 |
| 6 | Submission during tutorial time | 3 |

**Q1** **Two groups A & B of patients each consisting of 200 people are used to test effectiveness of a new serum. Group A is given serum while group B not. It is found that mean of two groups of A & B are 140 & 120 respectively and standard deviation of 14 & 12 respectively . Test at 1% LOS wether the new serum helps to cure the disease**.

# CODE

# sm1= 140 # mean for sample 1

# sm2=120 # mean for sample 2

# sd1=14 # standard deviation of sample1

# sd2=12 # standard deviation of sample2

# n1= 200 # size of sample 1

# n2= 200 # size of sample 2

# zcal= abs((sm1-sm2)/sqrt((sd1^2/n1)+(sd2^2/n2)))

# cat("absolute value of z-calculated is ",zcal)

# cat("Aarya Tiwari","16010421119")

# R-studio Screen shot

# 

# Answer

# H0:

# H1:

# N

# Let LOS α be 1%

# Table value of Z=2.33

# (using R software) *=*

# table value of Z so H0 is not accepted

# Conclusion : New serum helps to cure the disease under 1% LOS.

# 

**Small Sample Test**

**Steps**

# H0:= or =

# H1: or or or

# Nature of the test is one/two tailed

# Degree of freedom=n-1 or n1+n2-2

# LOS is 5% or 1%

# Table value of t is

# (using R software)

# 

# (=or) (samples are independent )

# table value of t so H0 (or H1) is accepted

# Conclusion

# Q2 Nine items of a sample had the following values 45,47,50,52,48,7,49,53,51. Does the mean of 9 items differ significantly from the assumed population mean 47.5?CODE to get value of

# pm=47.5 # population mean x <- c(45,47,50,52,48,7,49,53,51) smean =mean(x) # sample mean sdeviation=sd (x) n= 9 # size of sample tcal= abs((smean-pm)/(sdeviation/sqrt(n-1))) cat("absolute value of t-calculated is ",tcal) cat("Aarya Tiwari","16010421119")

# R-studio Screen shot

# 

**Answer**

**H0:=**

# H1:

# Nature of the test is two tailed

# Degree of freedom=n-1 =9

# LOS is 5% Table value of t is 2.26

# = 0.5586 (using R software)

# table value of t so H0 is accepted

# Conclusion: the assumed population mean is 47.5

**Q4.** **Samples of two types of electric bulbs were tested for length of life and the   following data were obtained. Test at 1% LOS whether type I is better than type II.**

**No. of samples Mean Standard deviation**

**Type I 8 1134 35**

**Type II 7 1024 40**

CODE to get value of

# sm1= 1134 # mean for sample 1

# sm2= 1024 # mean for sample 2

# sd1= 35 # standard deviation of sample1

# sd2= 40 # standard deviation of sample2

# n1= 8 # size of sample 1

# n2= 7 # size of sample 2

# tcal= abs((sm1-sm2)/sqrt(((n1\*sd1^2+n2\*sd2^2)/(n1+n2-2))\*((1/n1)+(1/n2))))

# cat("absolute value of t-calculated is ",tcal)

# cat("Aarya Tiwari" , "16010421119")

# R-studio Screen shot

# 

**Answer**

# H0: =

# H1:

# Nature of the test is one tailed

# Degree of freedom= n1+n2-2=14

# LOS is 5%

# Table value of t is 1.761 =

# = 5.288 (using R software)

# table value of t so H1 is accepted

# Conclusion: type 1 is better