Lab 06 (stat)

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Question 1:To test the claim that the resistance of an electric wire can be reduced by more than 0.050 ohm by alloying,32 values obtained for standard wire yielded π = 0.136ohm (sample mean) and sd1 = 0.004 ohm and 32 values obtained for alloyed wire yielded y ̄ = 0.083 ohm and sd2 = 0.005 ohm. At the 0.05 level of significance, does this support the claim? Evaluate the 90% confidence interval of difference between means? [Hint: generate the two sample using rnorm function]

H0:mu1-mu2=0.05 H1:mu1-mu2!=0.05

x<-rnorm(32,mean=0.136,sd=0.004)  
y<-rnorm(32,mean=0.083,sd=0.005)

?t.test

## starting httpd help server ... done

t.test(x,y,mu=0.05,alternative = "two.sided",var.equal = F)

##   
## Welch Two Sample t-test  
##   
## data: x and y  
## t = 2.4192, df = 55.076, p-value = 0.01889  
## alternative hypothesis: true difference in means is not equal to 0.05  
## 95 percent confidence interval:  
## 0.05050595 0.05539010  
## sample estimates:  
## mean of x mean of y   
## 0.13597121 0.08302318

Question 2: Given the marks of 30 students for a test conducted before and after an online course. Test whether the course was effective or not.

library(readxl)  
marks\_data <- read\_excel("C:/Users/PRASANTA/Downloads/marks data.xlsx")  
View(marks\_data)

colnames(marks\_data)

## [1] "Test 1" "Test 2"

x<-marks\_data$`Test 1`  
x

## [1] 8.0 5.0 8.0 7.0 4.0 4.0 5.0 3.0 10.0 6.0 5.0 5.0 2.0 3.0 5.0  
## [16] 4.0 5.0 5.0 2.5 5.0 6.5 4.0 6.5 3.0 5.0 1.0 5.0 6.0 4.0

y<-marks\_data$`Test 2`  
y

## [1] 4 7 6 7 6 6 7 3 7 7 7 7 6 4 6 6 7 5 7 5 3 3 6 5 6 5 5 6 5

d=difference of marks of students before and after taking the course H0:mean(d)=0 H1:mean(d)!0

x=marks\_data$`Test 1`  
y=marks\_data$`Test 2`  
t.test(x,y,paired=TRUE,alternative = "two.sided",conf.level = 0.95)

##   
## Paired t-test  
##   
## data: x and y  
## t = -1.9301, df = 28, p-value = 0.06379  
## alternative hypothesis: true mean difference is not equal to 0  
## 95 percent confidence interval:  
## -1.52821749 0.04545887  
## sample estimates:  
## mean difference   
## -0.7413793