A F&B manager wants to determine whether there is any significant difference in the diameter of the cutlet between two units. A randomly selected sample of cutlets was collected from both units and measured? Analyze the data and draw inferences at 5% significance level. Please state the assumptions and tests that you carried out to check validity of the assumptions.

Minitab File : **Cutlets.mtw**

# import csv files

cutlets<-read.csv(file.choose(),header = T)

View(cutlets)

attach(cutlets)

**#in our data sets y is continous and x is discrete**

**# in our data set give two population**

**# compare two population with each other**

**#next step is to check weather data is normalised or not using shapiro test**

colnames(cutlets)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [1] "Unit.A" "Unit.B"  **# we have to set hypothesis**  **#H0: Data is normally distributed(p>0.05)- null hypothesis**  **#H1: not normally distributed (p<0.05)- alternate hypothesis**  shapiro.test(Unit.A)   |  | | --- | | Shapiro-Wilk normality test  data: Unit.A  W = 0.96495, p-value = 0.32 | |  | | |  | | --- | | # p- value=0.32 >0.05,so p high null fly. it follows normal distribution | | |
|  |
| |  | | --- | |  |   shapiro.test(Unit.B)  Shapiro-Wilk normality test  data: Unit.B  W = 0.97273, p-value = 0.5225  # p- value=0.5225 >0.05,so p high null fly. it follows normal distribution  # so our data follows normal distribution  # next step is to check variance are equal  #calculate variance between two populations  # we have to set hypothesis  #H0: Variance(Unit.A) = variance(Unit.B) (p>0.05)  #H1 : Variance(Unit.A) are not equal to variance(Unit.B) (p<0.05)  var.test(Unit.A,Unit.B) ##variance test   |  | | --- | | F test to compare two variances  data: Unit.A and Unit.B  F = 0.70536, num df = 34, denom df = 34, p-value = 0.3136  alternative hypothesis: true ratio of variances is not equal to 1  95 percent confidence interval:  0.3560436 1.3974120  sample estimates:  ratio of variances  0.7053649 | |  | | |  | | --- | | > | |   # p-value=0.3136 >0.05 so p high null fly means reject alternatete hypothesis, accept  null hypothesis, that means variance between two population are equal  # here variance between two populations are equal, so perform 2 sample t test  ######## 2 SAMPLE T TEST#########  # first we have to set nullhypothesis  #H0: mean(Unit.A) = mean(Unit.B) #p>0.05  #H1: mean(Unit.A) not equal to mean(Unit. B) #p<0.05  t.test(Unit.A,Unit.B,alternative = "two.sided",conf.level = 0.95,correct=TRUE)   |  | | --- | | Welch Two Sample t-test  data: Unit.A and Unit.B  t = 0.72287, df = 66.029, p-value = 0.4723  alternative hypothesis: true difference in means is not equal to 0  95 percent confidence interval:  -0.09654633 0.20613490  sample estimates:  mean of x mean of y  7.019091 6.964297 | |  | | |  | | --- | | > | |   #p-value=0.4723 >0.05, this mean we can accept our null hypothesis  # null hypothesis is mean(Unit.A) = mean(Unit.B)  # here we get equal mean between Unit.A and Unit.B, so we can conclude that there is no significant difference  in the diameter of the cutlet between two units. |