Non-Parametric Tests in R

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July 2, 2019

**Question 1**

To find out how BMI value and Cholesterol levels of individuals differ with meal patterns of individuals.

**Aim 1**

**H0:** There is no significant changes in the means of cholesterol levels due to meal patterns.

**H1:** There is a significant change in the means of cholesterol levels due to meal patterns.

**Procedure**

library(readxl)

## Warning: package 'readxl' was built under R version 3.5.2

data <- read\_excel("C:/Users/Jeevan/Desktop/Christ University/Statistics/DOE/Assignment5...xlsx",sheet = 1)  
View(data)  
attach(data)  
wilcox.test(data$`Cholestral level`~data$mealpattern)

##   
## Wilcoxon rank sum test with continuity correction  
##   
## data: data$`Cholestral level` by data$mealpattern  
## W = 2240, p-value = 0.06083  
## alternative hypothesis: true location shift is not equal to 0

**Conclusion**

The calculated probability value is greater than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be concluded that there is no significant difference in the means of cholesterol level due to meal patterns of the individuals.

**Aim 2**

**H0:** There is no significant changes in the means of BMI values due to meal patterns.

**H1:** There is no significant changes in the means of BMI values due to meal patterns.

wilcox.test(data$BMI~data$mealpattern)

##   
## Wilcoxon rank sum test with continuity correction  
##   
## data: data$BMI by data$mealpattern  
## W = 2113, p-value = 0.3503  
## alternative hypothesis: true location shift is not equal to 0

as.factor(data$mealpattern)

## [1] non veg non veg non veg non veg non veg non veg non veg non veg  
## [9] non veg non veg non veg non veg non veg non veg non veg non veg  
## [17] non veg non veg veg veg veg veg veg veg   
## [25] veg veg veg veg veg non veg non veg non veg  
## [33] non veg non veg non veg non veg non veg non veg non veg non veg  
## [41] non veg non veg non veg non veg non veg non veg non veg non veg  
## [49] non veg non veg non veg non veg non veg non veg non veg non veg  
## [57] non veg non veg non veg non veg non veg veg veg veg   
## [65] veg veg veg veg veg veg veg veg   
## [73] veg veg veg veg non veg non veg non veg non veg  
## [81] non veg non veg non veg non veg non veg non veg non veg non veg  
## [89] non veg non veg non veg non veg non veg non veg non veg non veg  
## [97] non veg non veg non veg non veg veg veg veg veg   
## [105] veg veg veg veg veg veg veg veg   
## [113] veg veg veg veg veg veg veg veg   
## [121] veg veg veg veg veg veg   
## Levels: non veg veg

**Conclusion**

The calculated probability value is greater than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be concluded that there is no significant difference in the means of BMI values due to meal patterns of the individuals.

**Question 2**

To find out how BMI value and Cholesterol levels of individuals differ with residences of individuals.

**Aim 1**

**H0:** There is no significant changes in the means of BMI values due to residence.

**H1:** There is a significant change in the means of BMI values due to residence.

**Procedure**

data2 <- read\_excel("C:/Users/Jeevan/Desktop/Christ University/Statistics/DOE/Assignment5...xlsx",sheet = 2)  
View(data2)  
data2$Residence<-as.factor(data2$Residence)  
kruskal.test(data2$BMI~data2$Residence)

##   
## Kruskal-Wallis rank sum test  
##   
## data: data2$BMI by data2$Residence  
## Kruskal-Wallis chi-squared = 1.0105, df = 2, p-value = 0.6034

**Conclusion**

The calculated probability value is greater than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be concluded that there is no significant difference in the means of BMI values due to residence of the individuals.

**Aim 2**

**H0:** There is no significant changes in the means of cholesterol levels due to residence.

**H1:** There is a significant change in the means of cholesterol levels due to residence.

**Procedure**

kruskal.test(data2$`Cholestral level`~data2$Residence)

##   
## Kruskal-Wallis rank sum test  
##   
## data: data2$`Cholestral level` by data2$Residence  
## Kruskal-Wallis chi-squared = 1.5792, df = 2, p-value = 0.454

**Conclusion**

The calculated probability value is greater than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be concluded that there is no significant difference in the means of cholesterol levels due to residence of the individuals.

**Question 3**

To find out how BMI value of individuals differ with meal patterns and residence of individuals.

**Aim 1**

**H0:** There is no significant changes in the means of BMI values due to residence.

**H1:** There is a significant change in the means of BMI values due to residence.

**Procedure**

data3 <- read\_excel("C:/Users/Jeevan/Desktop/Christ University/Statistics/DOE/Assignment5...xlsx",sheet = 3)  
View(data3)  
data3$Residence<-as.factor(data3$Residence)  
data3$mealpattern<-as.factor(data3$mealpattern)  
model<-aov(data3$BMI~data3$Residence)  
summary(model)

## Df Sum Sq Mean Sq F value Pr(>F)  
## data3$Residence 2 4.4 2.201 0.131 0.877  
## Residuals 123 2067.6 16.810

**Conclusion**

The calculated probability value is greater than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be concluded that there is no significant difference in the means of BMI values due to residence of the individuals.

**Aim 2**

**H0:** There is no significant changes in the means of BMI values due to meal pattern.

**H1:** There is a significant change in the means of BMI values due to meal pattern.

**Procedure**

model1<-aov(data3$BMI~data3$mealpattern)  
summary(model1)

## Df Sum Sq Mean Sq F value Pr(>F)  
## data3$mealpattern 1 2.6 2.603 0.156 0.694  
## Residuals 124 2069.4 16.689

**Conclusion**

The calculated probability value is greater than 0.05. Hence, the null hypothesis is accepted. Therefore, it can be concluded that there is no significant difference in the means of BMI values due to meal patterns of the individuals.