**##### Data and Packages #####**

install.packages("openxlsx")

require(openxlsx)

install.packages("RcmdrMisc")

require("RcmdrMisc")

Data <- read.xlsx("Data.xlsx", sheet = "Data")

Data\_mov <- read.xlsx("Data\_mov.xlsx", sheet = "Data\_mov")

Data\_AHC <- read.xlsx("Data\_AHC.xlsx", sheet = "Data\_AHC", rowNames=TRUE)

**##### Group Size x Month #####**

Month\_char <- as.character(Data$Month)

Data["Month\_char"]<-c(Month\_char)

GS\_Mo <- aov(GS ~ Month\_char, data = Data) # ANOVA one-way test

summary(GS\_Mo)

**##### Group Size x Season #####**

GS\_Se <- aov(GS ~ Season, data = Data) # ANOVA one-way test

summary(GS\_Se)

**##### Group Size x Year #####**

Year\_char <- as.character(Data$Year)

Data["Year\_char"]<-c(Year\_char)

GS\_Ye <- aov(GS ~ Year\_char, data = Data) # ANOVA one-way test

summary(GS\_Ye)

**##### Group Size x Calves #####**

normalityTest(GS ~ Calves, test="shapiro.test", data = Data) # Shapiro-Wilk normality test

bartlett.test(GS ~ Calves, data = Data) # Bartletts test

t.test(GS ~ Calves, alternative='two.sided', conf.level=.95, var.equal=TRUE, data = Data) # Students t-test

**##### Depth x Closing Season #####**

normalityTest(Depth ~ CS, test="shapiro.test", data = Data) # Shapiro-Wilk normality test

bartlett.test(Depth ~ CS, data = Data) # Bartletts test

t.test(Depth ~ CS, alternative='two.sided', conf.level=.95, var.equal=TRUE, data = Data) # Students t-test

**##### Calves x Coast #####**

Ca\_Co <- table(Data$Calves, Data$Coast)

fisher.test(Ca\_Co, conf.int=T, conf.level=0.95)

**##### Calves x Closing Season #####**

Ca\_CS <- table(Data$Calves, Data$CS)

fisher.test(Ca\_CS, conf.int=T, conf.level=0.95)

**##### Coast x Closing Season #####**

Co\_CS <- table(Data$Coast, Data$CS)

fisher.test(Co\_CS, conf.int=T, conf.level=0.95)

**##### Depth x Closing Season #####**

t.test(Depth ~ CS, alternative='two.sided', conf.level=.95, var.equal=TRUE, data = Data)

**##### Slope x Closing Season #####**

wilcox.test(Slope ~ CS, alternative="two.sided", data = Data)

**##### Movement x Depth #####**

wilcox.test(Depth ~ Movement, alternative="two.sided", data = Data\_mov)

**##### Movements x Tide #####**

Mo\_Ti <- table(Data\_mov$Movement, Data\_mov$Tide)

chisq.test(Mo\_Ti)

**##### Agglomerative Hierarchical Cluster #####**

# standardize parameters #

.S <- scale(Data\_AHC[,c("P1","P2","P3")])

Data\_AHC$S.P1 <- .S[,1]

Data\_AHC$S.P2 <- .S[,2]

Data\_AHC$S.P3 <- .S[,3]

# cluster #

d1 <- dist(Data\_AHC[,4:6])

hc <- hclust(d1,"average")

d2 <- cophenetic(hc)

cor(d1, d2)

plot(hc)

rect.hclust(hc,3)