library("neuralnet")

library("NeuralNetTools")

library("ggplot2")

library("GGally")

library("caret")

library(gmodels)

library(foreign)

zz <- file.path("U:","My Documents")

NEloc <- file.path(zz,"NE.sav")

NE <- read.spss(NEloc)

NE=data.frame(NE, stringsAsFactors = TRUE)

NE=NE[,-14]

colname=c("AD","QA","QB","QC","QD","EA","EB","CE","ED","EF","EI","EJ","D")

colnames(NE)=colname

summary(NE)

sapply(NE, class)

NE$AD<-as.factor(ifelse(NE$AD==1, "High", "Low"))

NE$QA=as.numeric (NE$QA)

NE$QB=as.numeric (NE$QB)

NE$QC=as.numeric (NE$QC)

NE$QD=as.numeric (NE$QD)

NE$EA=as.numeric (NE$EA)

NE$EB=as.numeric (NE$EB)

NE$CE=as.numeric (NE$CE)

NE$ED=as.numeric (NE$ED)

NE$EF=as.numeric (NE$EF)

NE$EI=as.numeric (NE$EI)

NE$EJ=as.numeric (NE$EJ)

NE$D=as.numeric (NE$D)

levels(NE$AD)

index = createDataPartition(NE$AD, p = .8, list = FALSE, times = 1)

train =NE[index,]

test= NE[-index,]

CrossTable(NE$AD)

CrossTable(train$AD)

CrossTable(test$AD)

model = as.formula(AD ~.)

NE.net <- neuralnet(model, data=train, hidden=c(10,10),

rep = 5,

act.fct = "logistic",

err.fct = "ce",

linear.output = F,

lifesign = "minimal",

stepmax = 1000000,

threshold = 0.001)

plotnet(NE.net, alpha.val = 0.8,

circle\_col = list('purple', 'green', 'brown'),

bord\_col = 'black')

NE.prediction <- compute(NE.net, test)

idx <- apply(NE.prediction$net.result, 1, which.max)

predicted <- as.factor(c('High', 'Low' )[idx])

confusionMatrix(predicted, test$AD)