

HW_07

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#####
# Company      : Stevens
# Project      : HW_07
# Purpose       : five (5) nodes in the hidden layer, to develop a classification model for the Diagnosis
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# Date         : 04/16/2022

## Delete all the objects from your R- environment.
#####
rm(list = ls())
#load the library
library(neuralnet)

dataFrame<-read.csv("D:/SEM 3/CS 513/HW_07/wisc_bc_ContinuousVar.csv",na.strings = '?')
View(dataFrame)
table(dataFrame$diagnosis)

##
##      B      M
## 357 212

dataFrame$diagnosis <- factor(dataFrame$diagnosis, levels = c('M','B'),labels = c(1,2))

#To factor the data set
dataFrame<-data.frame(lapply(na.omit(dataFrame),as.numeric))

# To split the data set into test and testing
idx<-sort(sample(nrow(dataFrame),as.integer(.70*nrow(dataFrame))))
training<-dataFrame[idx,]
test<-dataFrame[-idx,]
#?neuralnet()
model<- neuralnet(diagnosis~,training[-1], hidden=5, threshold=0.01)

#Plot the neural network
plot(model)

## test should have only the input colum
ann <-compute(model,test)
ann$net.result
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##      [,1]
## 2  0.99961926
## 3  0.99961926
## 5  0.99961926
## 8  0.99961926
## 10 0.99961926
## 14 1.99225005
## 15 0.99984444
## 16 0.99961926
## 18 0.99961926
## 19 0.99961926
## 21 1.99227100
## 22 1.99227100
## 27 0.99961926
## 46 0.99961926
## 49 1.99227100
## 50 1.90149216
## 54 0.99961926
## 55 0.99961926
## 58 0.99961926
## 65 0.99961926
## 66 0.99961926
## 72 1.99227100
## 73 0.99961926
## 78 0.99961926
## 79 0.99961926
## 80 1.99227100
## 81 1.99227100
## 96 0.99961926
## 101 0.99961926
## 105 1.99227100
## 108 1.99227100
## 111 1.99227100
## 116 1.99227100
## 117 1.99227100
## 119 0.99961926
## 121 1.99227100
## 122 0.99961926
## 124 1.99227100
## 125 1.99227100
## 130 0.99961926
## 134 1.99063154
## 141 1.99227100
## 142 0.99961926
## 144 1.99227100
## 151 1.99227100
## 153 1.99227100
## 155 1.94548958
## 156 1.99227100
## 162 0.99961926
## 165 0.99961926
## 166 1.99227100
## 167 1.99227100
## 169 0.99961926

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## 171 1.99227100
## 174 1.99227100
## 179 1.99227100
## 185 0.99976660
## 187 0.99961926
## 191 1.97689561
## 193 1.99227100
## 194 0.99961926
## 195 1.99227100
## 196 1.99227100
## 197 0.99961926
## 199 0.99961926
## 201 1.95198671
## 203 0.99961926
## 213 0.09748142
## 214 1.99227100
## 216 1.93018406
## 218 1.99227100
## 226 1.36092955
## 228 1.99227100
## 232 1.99227100
## 233 1.99226915
## 239 1.99219488
## 245 0.99961926
## 246 1.99225590
## 247 1.99227100
## 248 1.99227100
## 249 1.99052310
## 254 0.99961926
## 257 0.99961926
## 259 0.99961926
## 261 0.99961926
## 262 0.99961926
## 264 1.01682950
## 267 1.99227100
## 277 1.99227100
## 278 0.99961926
## 280 1.99227100
## 283 0.99961926
## 288 1.99227100
## 290 1.99227100
## 293 1.99227099
## 294 1.99227100
## 297 1.99227100
## 298 1.99227100
## 302 1.99227100
## 305 1.99227100
## 306 1.99227100
## 311 1.99227100
## 314 1.99227100
## 316 1.99227100
## 317 1.99227100
## 321 1.99227100
## 322 0.99961926
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## 328 1.99227100
## 329 0.99961926
## 331 0.99961926
## 334 1.99227100
## 335 1.99227100
## 336 0.99961926
## 342 1.99227100
## 343 1.99227100
## 346 1.99227100
## 350 1.99227100
## 371 0.99961926
## 378 1.99227100
## 380 0.99961926
## 389 1.99227100
## 390 0.99961926
## 396 1.99227100
## 397 1.99137122
## 400 1.99227100
## 406 1.99227100
## 418 0.99961926
## 425 1.99227100
## 426 1.99227100
## 428 1.99227093
## 432 1.99227100
## 433 0.99961926
## 435 1.99227100
## 440 1.99227100
## 441 1.99227100
## 443 1.99227100
## 445 0.99961926
## 446 1.99226931
## 449 1.99226878
## 454 1.99227100
## 455 1.99226821
## 461 0.99961926
## 465 1.99227061
## 475 1.99227100
## 479 1.99227100
## 480 1.00108670
## 488 0.99961926
## 491 1.99227096
## 494 1.99227100
## 498 1.99227100
## 499 0.99961926
## 507 1.99227100
## 512 1.99227100
## 514 1.99227079
## 520 1.99227100
## 524 1.99227100
## 530 1.99227100
## 533 1.99227100
## 534 0.99961926
## 538 1.99227100
## 541 1.99227100
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## 544 1.99227100
## 545 1.99227100
## 550 1.99227100
## 552 1.99227100
## 555 1.99227097
## 560 1.99227100
## 561 1.99227100
## 562 1.99227100
## 563 0.99961926
## 567 0.99961926

ann_cat<-ifelse(ann$net.result <1.5,1,2)
length(ann_cat)

## [1] 171

length(test$diagnosis)

## [1] 171

table(ann_cat,test$diagnosis)

## 
##   ann_cat    1     2
##       1 61     1
##       2  6 103

wrong<- (test$diagnosis!=ann_cat)
errorRate<-sum(wrong)/length(wrong)
errorRate

## [1] 0.04093567

```