Assignment 7

7.1: Use the ANN methodology with five (5) nodes in the hidden layer, to develop a classification model for the Diagnosis.

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#to clear entire environment and installation
rm(list = ls())
library(neuralnet)

df = read.csv("F:/Sem1/CS513/lecture7/wisc_bc_ContinuousVar.csv",header=TRUE, sep=",")
View(df)
df$diagnosis<-ifelse(df$diagnosis == "M",2,1)

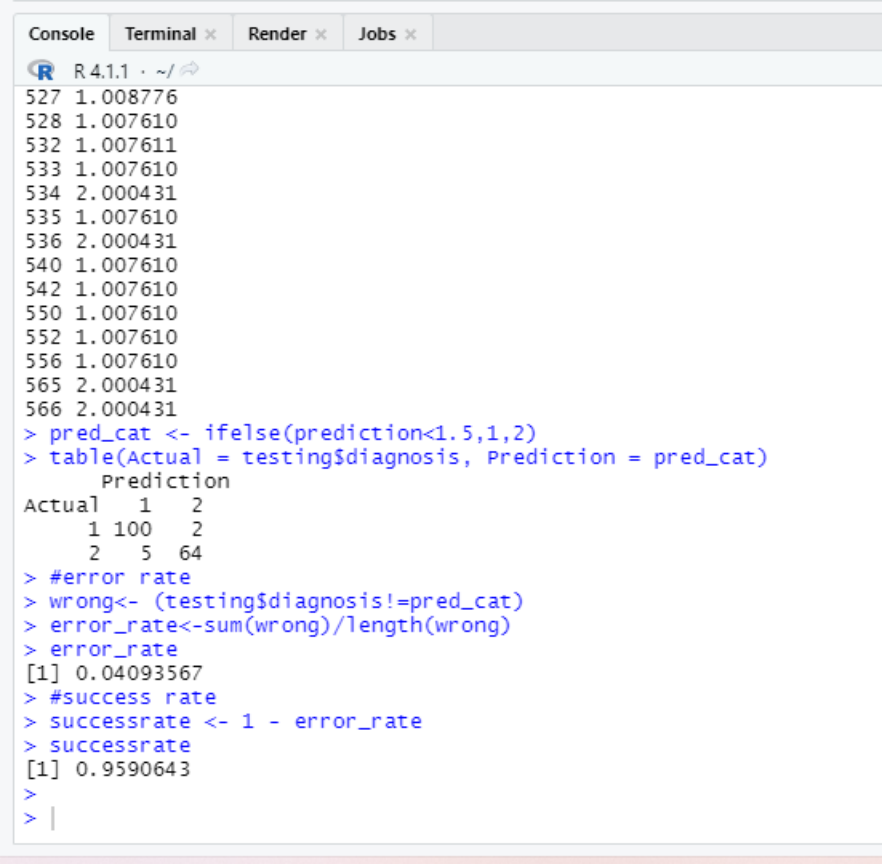
#70% training and 30% testing data
idx<-sort(sample(nrow(df),as.integer(.70*nrow(df))))
training<-df[idx,]
testing<-df[-idx,]

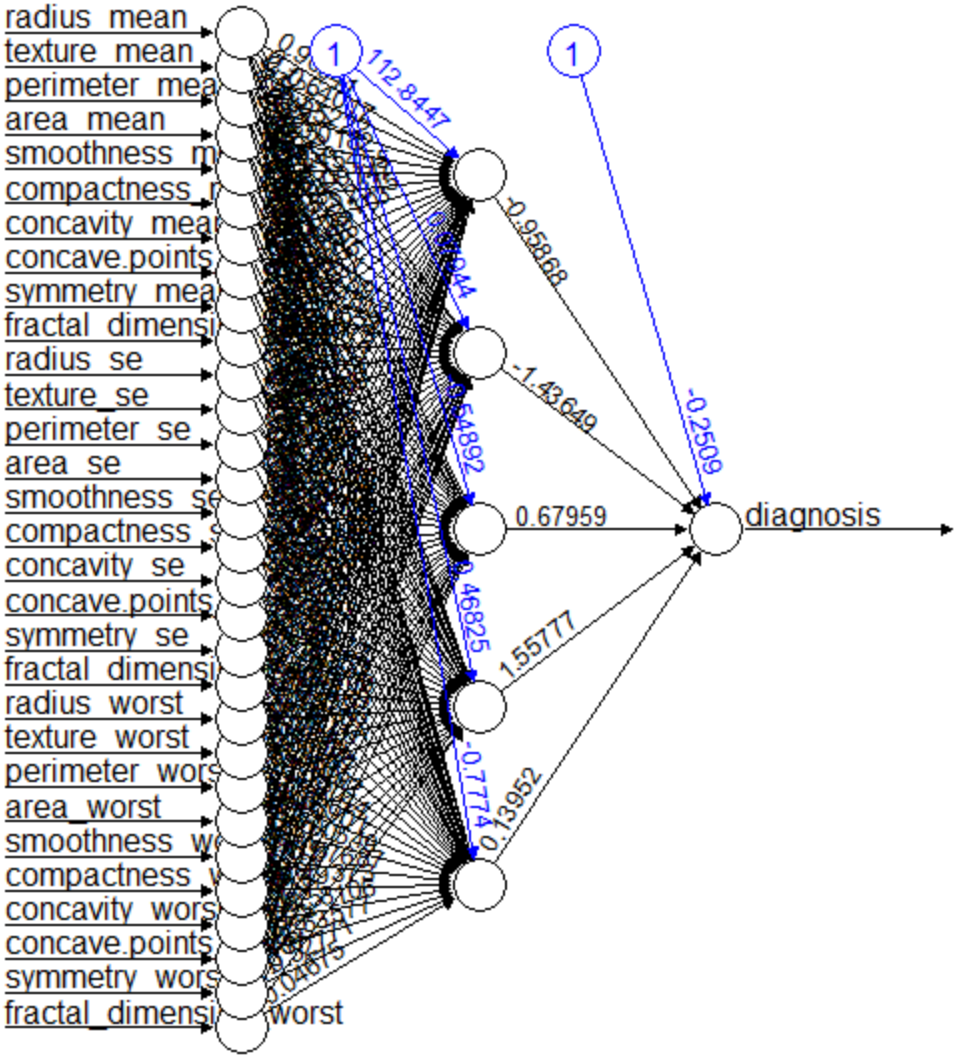
#ploting ANN
ann<- neuralnet( diagnosis~. ,training[,c(-1)], hidden=5,threshold=0.01)
plot(ann)
```

```
#prediction
prediction <-predict(ann , testing)
print(prediction)
pred_cat <- ifelse(prediction<1.5,1,2)
table(Actual = testing$diagnosis, Prediction = pred_cat)

#error rate
wrong<- (testing$diagnosis!=pred_cat)
error_rate<-sum(wrong)/length(wrong)
error_rate

#success rate
successrate <- 1 - error_rate
successrate
```


Console
Terminal
Render
Jobs
R 4.1.1 · ~/
527 1.008776
528 1.007610
532 1.007611
533 1.007610
534 2.000431
535 1.007610
536 2.000431
540 1.007610
542 1.007610
550 1.007610
552 1.007610
556 1.007610
565 2.000431
566 2.000431
> pred_cat <- ifelse(prediction<1.5,1,2)
> table(Actual = testing$diagnosis, Prediction = pred_cat)
Prediction
Actual 1 2
1 100 2
2 5 64
> #error rate
> wrong<- (testing$diagnosis!=pred_cat)
> error_rate<-sum(wrong)/length(wrong)
> error_rate
[1] 0.04093567
> #success rate
> successrate <- 1 - error_rate
> successrate
[1] 0.9590643
>
>


radius_mean
texture_mean
perimeter_mea
area_mean
smoothness_m
compactness_
concavity_mea
concave.points
symmetry_mea
fractal_dimensi
radius_se
texture_se
perimeter_se
area_se
smoothness_se
compactness_
concavity_se
concave.points
symmetry_se
fractal_dimensi
radius_worst
texture_worst
perimeter_wors
area_worst
smoothness_w
compactness_w
concavity_wors
concave.points
symmetry_wors
fractal_dimensi
worst
1
112.8447
0.01044
0.54892
0.46825
-0.7774
0.13952
1
-0.95868
-1.43649
-0.2509
0.67959
diagnosis