

ANN(10,9,8)

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R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
#load the necessary packages
install.packages(c("neuralnet", "keras", "tensorflow"), dependencies = T)
```

```
## Installing packages into '/cloud/lib/x86_64-pc-linux-gnu-library/4.4'
## (as 'lib' is unspecified)
```

```
library(neuralnet)
install.packages("tidyverse")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.4'
## (as 'lib' is unspecified)
```

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
## v dplyr      1.1.4      v readr      2.1.5
## v forcats    1.0.0      v stringr    1.5.1
## v ggplot2    3.5.1      v tibble     3.2.1
## v lubridate  1.9.3      v tidyr      1.3.1
## v purrr      1.0.2
```

```
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::compute() masks neuralnet::compute()
## x dplyr::filter()  masks stats::filter()
## x dplyr::lag()     masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
#data preparation
iris<-iris %>%mutate_if(is.character, as.factor)
```

```
#Sample of the dataset
set.seed(123)
iris_sample <- iris %>% sample_n(10)
summary(iris_sample)
```

```
##   Sepal.Length   Sepal.Width   Petal.Length   Petal.Width   Species
##   Min.      :4.300   Min.      :2.500   Min.      :1.10   Min.      :0.100   setosa      :3
##   1st Qu.:5.125   1st Qu.:2.775   1st Qu.:2.05   1st Qu.:0.450   versicolor:3
```

```
## Median :5.650 Median :3.000 Median :4.50 Median :1.350 virginica :4
## Mean :5.670 Mean :3.010 Mean :3.89 Mean :1.230
## 3rd Qu.:6.050 3rd Qu.:3.150 3rd Qu.:5.10 3rd Qu.:1.875
## Max. :7.700 Max. :3.800 Max. :6.70 Max. :2.200
```

```
# Train and test split
```

```
set.seed(254)
```

```
data_rows<-floor(0.80 * nrow(iris_sample))
```

```
data_rows
```

```
## [1] 8
```

```
train_indices<-sample(c(1:nrow(iris_sample)), data_rows)
```

```
train_indices
```

```
## [1] 7 4 8 5 9 1 10 2
```

```
train_data<-iris_sample[train_indices, ]
```

```
train_data
```

```
## Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 7 5.5 2.5 4.0 1.3 versicolor
## 4 4.4 3.2 1.3 0.2 setosa
## 8 5.5 2.6 4.4 1.2 versicolor
## 5 5.9 3.0 5.1 1.8 virginica
## 9 5.8 2.7 5.1 1.9 virginica
## 1 4.3 3.0 1.1 0.1 setosa
## 10 6.1 3.0 4.6 1.4 versicolor
## 2 5.0 3.3 1.4 0.2 setosa
```

```
test_data<-iris_sample[-train_indices,]
```

```
test_data
```

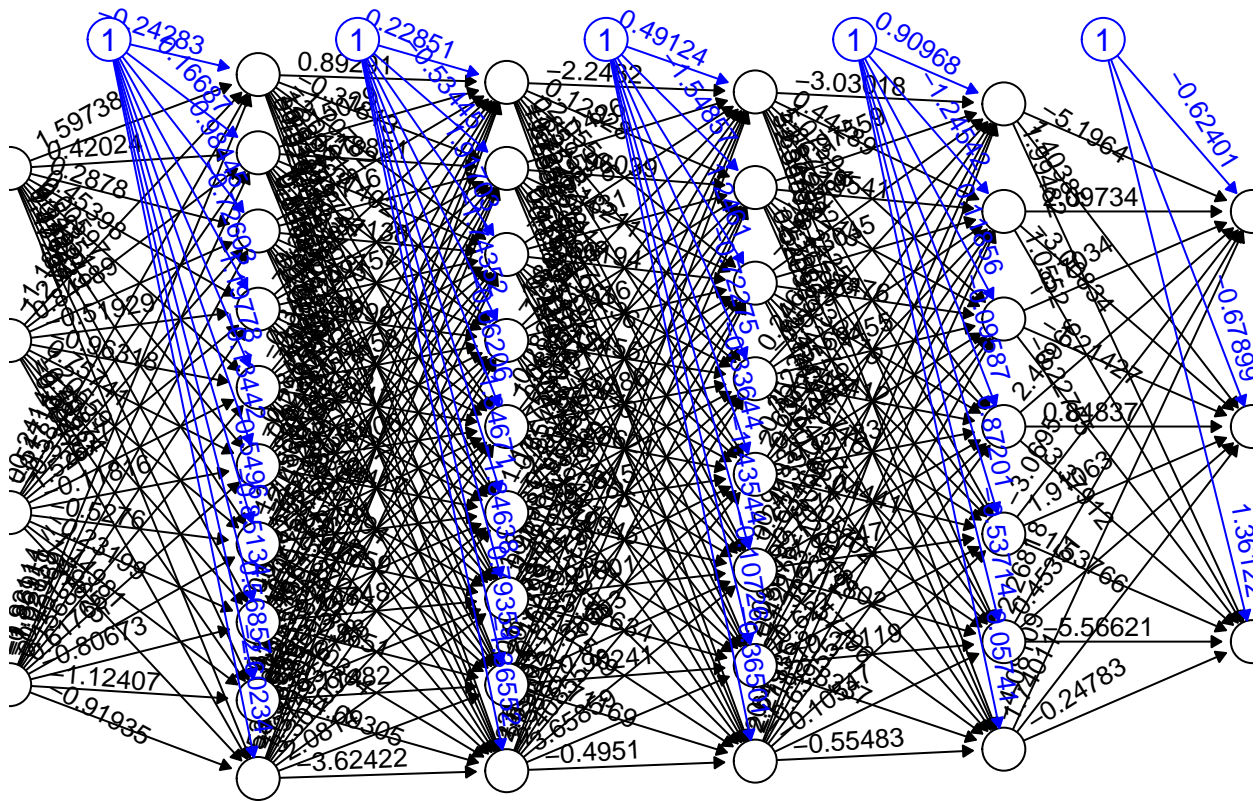
```
## Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 3 7.7 3.8 6.7 2.2 virginica
## 6 6.5 3.0 5.2 2.0 virginica
```

```
#model training
```

```
model<-neuralnet( Species ~ Sepal.Length +Sepal.Width+Petal.Length +Petal.Width, data = train_data, hid
```

```
#plot the model
```

```
plot(model, rep = 'best')
```



Error: 0.008022 Steps: 46

#predicting with the model

```
pred<-predict(model, test_data)
pred
```

```
##           [,1]      [,2]      [,3]
## 3 0.044703417 0.03193304 0.9721169
## 6 0.005014164 0.12700612 0.9698141
```

```
labels<-c("setosa", "versicolor", "virginica")
labels
```

```
## [1] "setosa"      "versicolor" "virginica"
```

#mapping prediction to labels

```
prediction_label<-data.frame(max.col(pred))>%mutate(pred=labels[max.col.pred.])>% select(2) >%
unlist()
table(test_data$Species, prediction_label)
```

```
##           prediction_label
##           virginica
## setosa              0
## versicolor          0
## virginica            2
```

```
summary(test_data)
```

```
## Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## Min. :6.5 Min. :3.0 Min. :5.200 Min. :2.00 setosa :0
## 1st Qu.:6.8 1st Qu.:3.2 1st Qu.:5.575 1st Qu.:2.05 versicolor:0
```

```
## Median :7.1   Median :3.4   Median :5.950   Median :2.10   virginica :2
## Mean    :7.1   Mean     :3.4   Mean     :5.950   Mean     :2.10
## 3rd Qu.:7.4   3rd Qu.:3.6   3rd Qu.:6.325   3rd Qu.:2.15
## Max.    :7.7   Max.     :3.8   Max.     :6.700   Max.     :2.20
```

```
#accuracy of the model
```

```
check= as.numeric(test_data$Species) == max.col(pred)
check
```

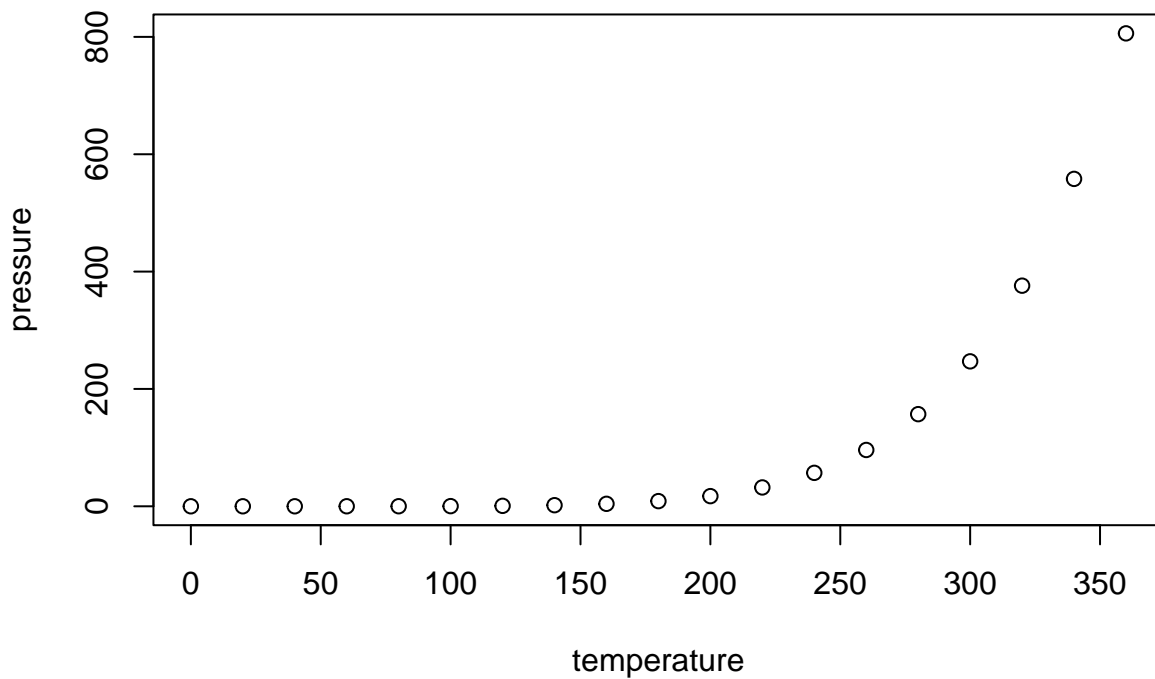
```
## [1] TRUE TRUE
```

```
accuracy<-(sum(check)/nrow(test_data))*100
print(accuracy)
```

```
## [1] 100
```

Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.