Neural Networks

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2023-09-21

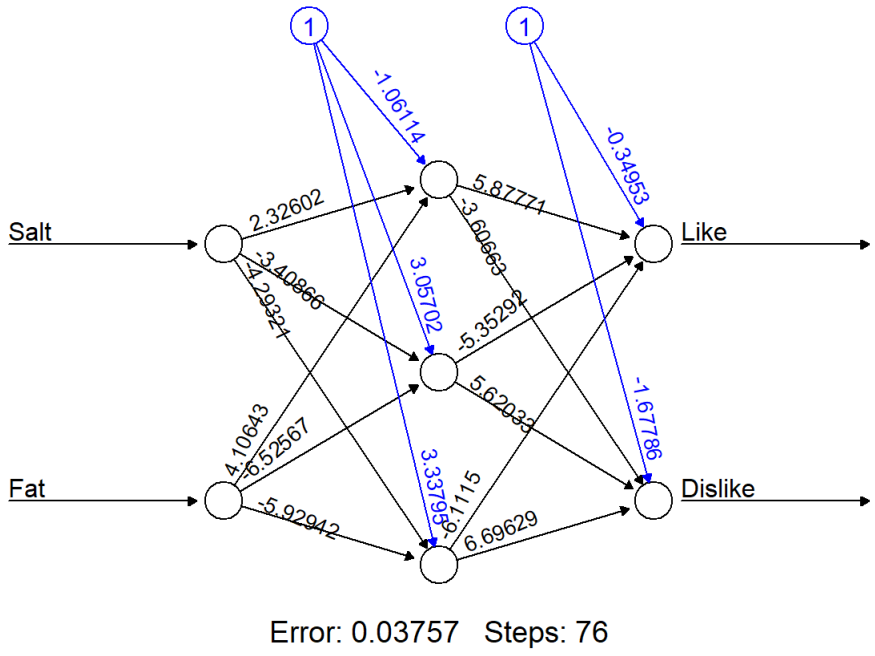
```
library(neuralnet)
df <- read.csv("C:\\Users\\dev46\\OneDrive\\Desktop\\School Documents\\Spring 2023\\MGQ 408 Bus. Analytics & Data Science
\\Data\\TinyData.csv")

df$Like <- df$Acceptance == 'like'
df$Dislike <- df$Acceptance == 'dislike'

set.seed(1)
nn <- neuralnet(Like + Dislike ~ Salt + Fat, data = df,
                linear.output = F, hidden = 3)

# display weights
#nn$weights
# display predictions
#prediction(nn)

# plot network
plot(nn, rep="best")
```



```
car.df <- read.csv("C:\\Users\\dev46\\OneDrive\\Desktop\\School Documents\\Spring 2023\\MGQ 408 Bus. Analytics & Data Scie
nce\\Data\\ToyotaCorolla.csv")
car.df <- car.df[, c("Price", "Age_08_04", "KM", "Fuel_Type", "HP", "Automatic", "Doors", "Quarterly_Tax","Mfr_Guarantee",
"Guarantee_Period","Airco", "Automatic_airco", "CD_Player", "Powered_Windows", "Sport_Model", "Tow_Bar")]
car.df$Fuel_Type_CNG <- 1 * (car.df$Fuel_Type == "CNG")
car.df$Fuel_Type_Diesel <- 1 * (car.df$Fuel_Type == "Diesel")
car.df <- car.df[,-c(4)]

train.index <- sample(c(1:dim(car.df)[1]), dim(car.df)[1]*0.60)
train.df <- car.df[train.index, ]
valid.df <- car.df[-train.index, ]
train.norm.df <- train.df
valid.norm.df <- valid.df

library(caret)
```

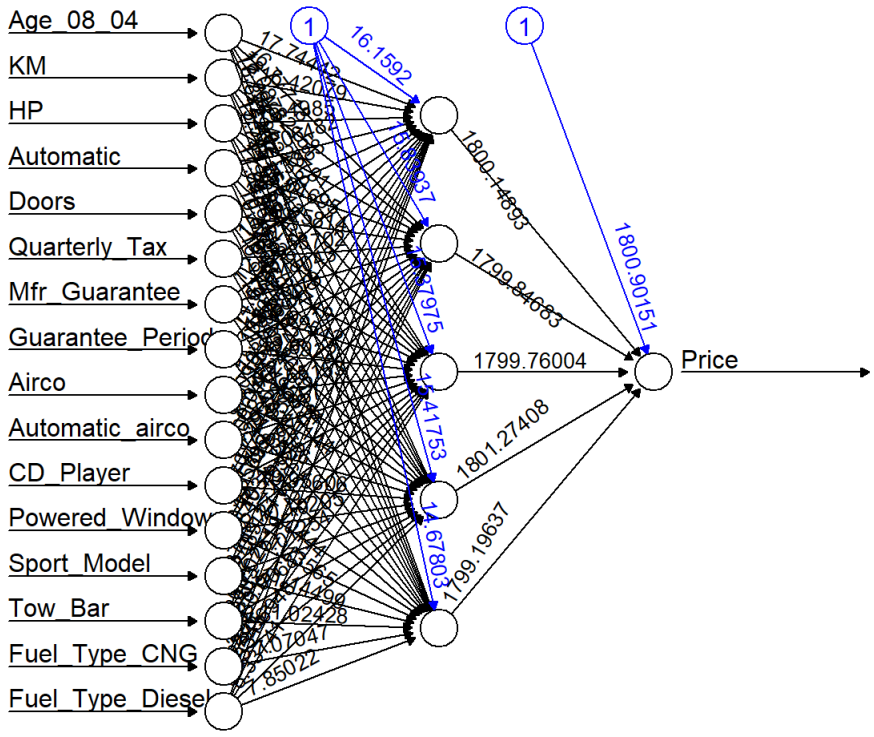
```
## Loading required package: ggplot2
```

```
## Loading required package: lattice
```

```
library(neuralnet)
library(forecast)
```

```
## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo
```

```
norm.values <- preProcess(train.df[,-c(1)], method = "range")
train.norm.df <- predict(norm.values, train.df)
valid.norm.df <- predict(norm.values, valid.df)
nn <- neuralnet(Price ~ ., data= train.norm.df, hidden = c(5), linear.output = T)
validation.prediction <- compute(nn, valid.norm.df[,-c(1)])
plot(nn, rep="best")
```



```
accuracy(as.numeric(validation.prediction$net.result), valid.norm.df$Price)
```

```
##                 ME     RMSE      MAE       MPE     MAPE
## Test set -175.5747 3522.522 2639.208 -10.70331 25.26016
```