# Load required libraries

library(nnet)

library(NeuralNetTools)

library(caret)

# Read the data

GroupData <- read.csv(file.choose(), header = TRUE)

# Ensure the target variable is a factor

GroupData$HighValueCar <- as.factor(GroupData$HighValueCar)

# Train the neural network model

set.seed(1000)

GroupNN <- nnet(HighValueCar ~ ., data = GroupData, size = 4, maxit = 100000, decay = 0.01)

# Plot the neural network

plotnet(GroupNN)

# Make predictions on the training data

predictions <- predict(GroupNN, GroupData, type = "class")

# Ensure predictions and actual values have the same levels

predictions <- factor(predictions, levels = levels(GroupData$HighValueCar))

# Create a confusion matrix

confusion\_matrix <- confusionMatrix(predictions, GroupData$HighValueCar)

# Display confusion matrix

print(confusion\_matrix)

# Calculate and display accuracy

accuracy <- confusion\_matrix$overall["Accuracy"]

cat("Accuracy:", accuracy, "\n")

# Calculate and display precision, recall, and F1-score

precision <- confusion\_matrix$byClass["Precision"]

recall <- confusion\_matrix$byClass["Recall"]

f1\_score <- confusion\_matrix$byClass["F1"]

cat("Precision:", precision, "\n")

cat("Recall:", recall, "\n")

cat("F1-Score:", f1\_score, "\n")