```
library(caret)
library(ggplot2)
library(rpart)
library(rpart.plot)
library(e1071)

data <- read.csv("C:\\Users\\user11\\Desktop\\bank-loan.csv")
head(data)
data$default <- as.factor(data$default)
str(data)

set.seed(42)
splitIndex <- createDataPartition(data$default, p = 0.8, list = FALSE)
traindata <- data[splitIndex, ]
testdata <- data[splitIndex, ]

#checking table distribution
table(traindata$default)
table(testdata$default)

#Train Decision Tree Model
dt_model <- rpart(default ~ ., data = data, method = "class") #by default it is Gini index
print(dt_model)
png("Decision Tree.png", width = 800, height = 600)
rpart.plot(dt_model,
       main = "Decision Tree Chart",
       cex = 1)
dev.off()

#Confusion Matrix
dt_prob <- predict(dt_model, testdata, type = "prob")
```

```
dt_pred <- ifelse(dt_prob[,2] > 0.5, 1, 0)
dt_pred <- as.factor(dt_pred)

dt_conf_matrix <- confusionMatrix(dt_pred, testdata$default)
dt_conf_matrix

#ROC Curve
library(pROC)
dt_roc_curve <- roc(testdata$default, dt_prob[,2])
plot(dt_roc_curve,
    main = "ROC Curve - Decision Tree",
    col = "purple",
    lwd = 2)
dt_auc_roc <- auc(dt_roc_curve)
cat("Decision Tree AUC: ", dt_auc_roc)
```