

```

```{r}
install.packages("rpart")
```

```{r}
install.packages("tidyverse")
library(tidyverse)
```

```{r}
install.packages("randomForest")
library(randomForest)
```

```{r}
library(rpart)
```

```{r}
set.seed(123)
x1 <- rnorm(500,mean = 5, sd = 7)
x2 <- rnorm(500,mean = 8, sd = 20)
x3 <- rnorm(500,mean = 10, sd = 70)
x4 <- sample(LETTERS[1:4],500,replace =TRUE)
y <- ifelse(x1+x2+x3>20,1,0)
df<- data.frame(x1,x2,x3,x4,y)
```

```{r}
head(df)
```

```{r}
write.csv(df,"syntheticcds.csv")
```

```{r}
ti <- sample(nrow(df),0.7*nrow(df))
train <-df[ti,]
test<- df[-ti,]
```

```{r}
head(train)
```

```{r}
head(test)
```

```{r}
rf <- randomForest(y~.,data=train,ntree = 500)
```

```{r}
pred <- predict(rf,test)
```

```{r}
install.packages("Metrics")
```

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```
```{r}  
library(Metrics)
mae(pred,test[, "y"])
```
```

```
```{r}  
install.packages("rpart.plot")
```
```

```
```{r}  
library(rpart.plot)
tree <- rpart(y~., data = df, cp =0.000001)
rpart.plot(tree, box.palette = "RdBu", shadow.col="gray", nn =TRUE)
```
```