**1. Use the below given data set**

**DataSet**

Ans:

df <- read.csv("https://archive.ics.uci.edu/ml/machine-learning-databases/00273/Example\_WearableComputing\_weight\_lifting\_exercises\_biceps\_curl\_variations.csv",

header = FALSE)

data<-df[-1,]

head(data)

colnames(data) <- as.character(unlist(data[1,]))

data1 = data[-1, ]

data1<-as.data.frame(lapply(data1, as.integer))

table(data1$classe)

data1$classe<-as.factor(data1$classe)

head(data1)

replacement\_vec <- c("A", "B", "C", "D","E")

levels(data1$classe) <- replacement\_vec

**2. Perform the below given activities:**

**a. Create classification model using different decision trees.**

Ans:

#decision tree with party pakage

library(party)

tree<-ctree(classe~.,data=data1)

tree

plot(tree)

#predctions

predict(tree,data1)

cm<-table(predict(tree),data1$classe)

##decision tree with rpart pakage

library(rpart)

tree1<-rpart(classe~.,data=data1)

library(rpart.plot)

rpart.plot(tree1,extra=4,cex = 0.6)

**b. Verify model goodness of fit.**

Ans:

##model goodness of fit

actual<-table(data1$classe)

expected<-table(predict(tree))

chisq.test(actual, p = expected/sum(expected))

**c. Apply all the model validation techniques.**

Ans:

library(caret)

train\_control<- trainControl(method="cv", number=10, savePredictions = TRUE)

model<- train(classe~., data=data1, trControl=train\_control, method="rpart")

model$pred

modle1<-train(classe~., data=data1, trControl=train\_control, method="ctree")

**d. Make conclusions**

Ans:

model

cp Accuracy Kappa

0.1039940 0.9304457 0.8990790

0.3394876 0.7466148 0.6179779

0.5143180 0.5435233 0.3085186

#For "rpart" Accuracy was used to select the optimal model using the largest value.

The final value used for the model was cp = 0.103994

modle1

mincriterion Accuracy Kappa

0.01 1 1

0.50 1 1

0.99 1 1

#for cAccuracy was used to select the optimal model using the largest value.

The final value used for the model was mincriterion = 0.99.