**#import the libraries**

**library("Metrics")**

**library("DAAG")**

**library("lattice")**

**# Import dataset**

datasets\_582088\_1052144\_Advertising <- read.csv("datasets\_582088\_1052144\_Advertising.csv")

**#split the dataset into train and test dataset**

train\_dataset =datasets\_582088\_1052144\_Advertising[1:140,]

**#Visualize first 6 dataset**

head(datasets\_582088\_1052144\_Advertising)

**#split the dataset into train and test dataset**

test\_dataset=datasets\_582088\_1052144\_Advertising[141:200,]

**#Visualize first 6 dataset**

head(datasets\_582088\_1052144\_Advertising)

**#bind the columns into a single frame**

s=cbind("TV","Radio","Newspaper")

**#calculate regression coefficient values for each column**

TV1=lm(Sales~TV,data=train\_dataset)

TV1

Radio1=lm(Sales~Radio,data=train\_dataset)

Radio1

Newspaper1=lm(Sales~Newspaper,data=train\_dataset)

Newspaper1

**#summaries the errors**

Summary(TV1)

Summary(Radio1)

Summary(Newspaper1)

**#display dataset in form of dimensions**

dim(datasets\_582088\_1052144\_Advertising)

**#plot a graph for train data set**

plot(train\_dataset$Sales~train\_dataset$TV,xlab="TV",ylab = "Sales")

abline(TV1)

plot(train\_dataset$Sales~train\_dataset$Radio,xlab="Radio",ylab = "Sales")

abline(Radio1)

plot(train\_dataset$Sales~train\_dataset$Newspaper,xlab="Newspaper",ylab="Sales")

abline(Newspaper1)

**#predict the new calculated Sales value by taking both train and test dataset**

Tvp=predict(TV1,train\_dataset)

Radiop=predict(Radio1,train\_dataset)

Newspaperp=predict(Newspaper1,train\_dataset)

Tvt=predict(TV1,test\_dataset)

Radiot=predict(Radio1,test\_dataset)

Newspapert=predict(Newspaper1,test\_dataset)

**#calculate MEAN squired error function**

TVtrain\_mse=mse(train\_dataset$Sales,Tvp)

TVtrain\_mse

Radiotrain\_mse=mse(train\_dataset$Sales,Radiop)

Radiotrain\_mse

Newspapertrain\_mse=mse(train\_dataset$Sales,Newspaperp)

Newspapertrain\_mse

TVtest\_mse=mse(test\_dataset$Sales,Tvt)

TVtest\_mse

Radiotest\_mse=mse(test\_dataset$Sales,Radiot)

Radiotest\_mse

Newspapertest\_mse=mse(test\_dataset$Newspaper,Newspapert)

Newspapertest\_mse

**#combines the calculated MSE Results**

TrainMSE=c(TVtrain\_mse,Radiotrain\_mse,Newspapertrain\_mse)

TrainMSE

TestMSE=c(TVtest\_mse,Radiotest\_mse,Newspapertest\_mse)

TestMSE

**#plot barplot for calculated MSE**

barplot(TrainMSE,width = 0.02,xlab="data",ylab="error",main="Training Error")

barplot(TestMSE,width=0.02,xlab = "data",ylab="error",main="Testing Error")

**#plot a final model of coefficient variation**

model1=cv.lm(data,(Sales~TV),m=5)