Ex.No:6 Date:	IMPLEMENTATION OF LINEAR REGRESSION

AIM:

To write the implementation of linear regression.

PROCEDURE:

1. Linear regression is used to predict a quantitative outcome variable (y) on the basis of one or multiple predictor variables (x)
2. The goal is to build a mathematical formula that defines y as a function of the x variable.
3. When you build a regression model, you need to assess the performance of the predictive model.
4. Two important metrics are commonly used to assess the performance of the predictive regression model:
5. Root Mean Squared Error, which measures the model prediction error. It corresponds to the average difference between the observed known values of the outcome and the predicted value by the model. RMSE is computed as RMSE = mean((observeds - predicteds)^2) %>% sqrt(). The lower the RMSE, the better the model.
6. R-square, representing the squared correlation between the observed known outcome values and the predicted values by the model. The higher the R2, the better the model.

PROGRAM:

```
X=c(151,174,138,186,128,136,179,163,152,131)

Y=c(63,81,56,91,47,57,76,72,62,48)

plot(X,Y)

relation=lm(Y~X)

print(relation)

print(summary(relation))

a=data.frame(X=170)

result=predict(relation,a)

print(result)

png(file="linearregression.png")
```

```
plot(Y,X,col="green",main="Height & Weight Regression",abline(lm(X~Y)),
cex=1.3,pch=16,Xlab="Weight in kg",Ylab="Height in cm")

dev.off()
```

RESULT:

Thus the implementation of linear regression was executed and verified successfully.

OUTPUT:

```
> a=data.frame(X=170)

>result=predict(relation,a)

>print(result)

       1

76.22869

>png(file="linearregression.png")

>plot(Y,X,col="green",main="Height & Weight Regression",abline(lm(X~Y)),
cex=1.3,pch=16,Xlab="Weight in kg",Ylab="Height in cm")

>dev.off()

RStudioGD

       2
```