Linear Regression

```
#values of height
x = c(150,174,138,176,128,136,179,163,152,132)
y = c(62,81,56,81,47,57,76,72,62,49)

# lm() function to create the relational model
relation = lm(y~x)
print(relation)
print(summary(relation))

# predict() function will be used to predict
a = data.frame(x=170)
result = predict(relation,a)
print(result)

# plot for visualization
png(file="linearregression.png")

plot(y,x,col="red",main="Height and Weight Regression",abline(lm(x~y)),cex=1.3,pch=16,xlab="Weight in kg",ylab
dev.off()
```

- The x-axis represents weight in kilograms(xlab="Weight in kg").
- The y-axis represents height in centimeters(ylab = "Height in cm").
- The points in the plot are colored red(col="red") and are solid circles(pch=16) of size 1.3(cex=1.3).
- A linear regression line is added(abline(lm(x~y))) to show the relationship between weight and height.
- The main title of the plot is "Height and Weight Regression"(main="Height and Weight Regression).

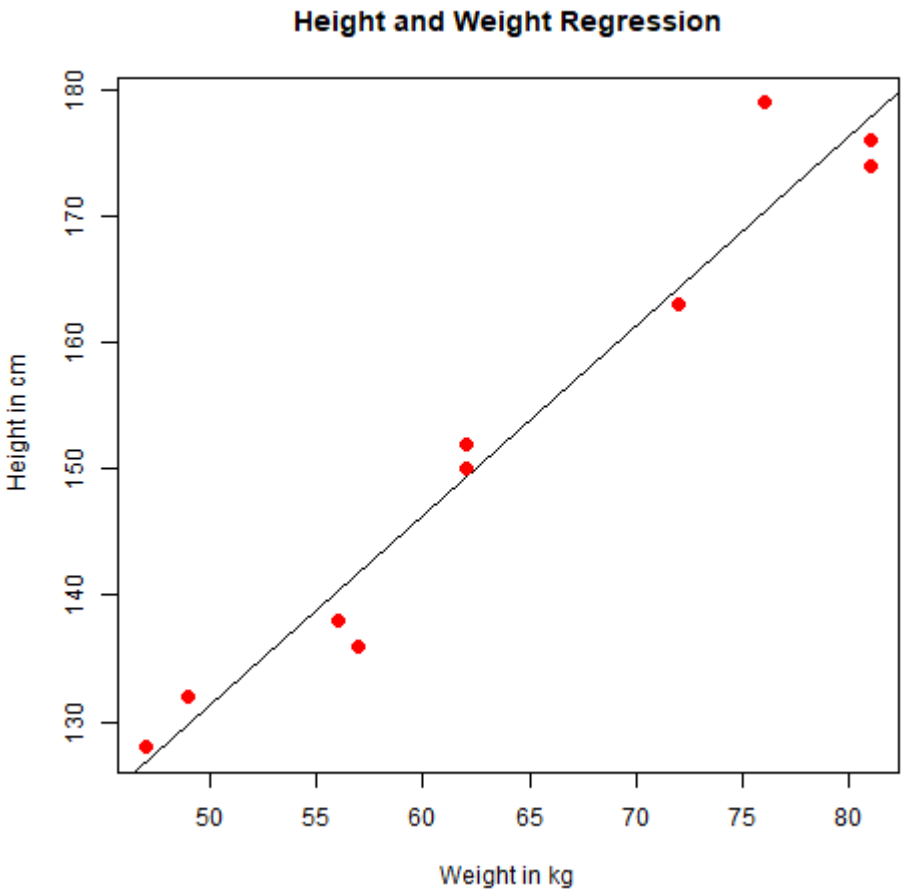
```
Console   Terminal   Background Jobs
R 4.4.1 · ~/
lm(formula = y ~ x)

Residuals:
   Min     1Q Median     3Q    Max
-5.012 -1.713  0.313  1.725  3.416

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -33.1629     7.4783  -4.435  0.00218 **
x             0.6379     0.0486  13.125 1.08e-06 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.807 on 8 degrees of freedom
Multiple R-squared:  0.9556,    Adjusted R-squared:  0.9501
F-statistic: 172.3 on 1 and 8 DF,  p-value: 1.08e-06

>
> # predict() function will be used to predict
> a = data.frame(x=170)
> result = predict(relation,a)
> print(result)
       1
75.27096
>
> # plot for visualization
> png(file="linearregression.png")
>
> plot(y,x,col="red",main="Height and Weight Regression",abline(lm(x~y)),cex=1.3,p
ch=16,xlab="Weight in kg",ylab = "Height in cm")
> dev.off()
null device
          1
>
```


Height and Weight Regression
Height in cm
Weight in kg
130
140
150
160
170
180
50
55
60
65
70
75
80