**PRACTICAL NO.5**

**Perform the Linear regression on the given data warehouse data using R/Python.**

**Q.The heights and weights of students in XYZ college is given below:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **X(Height)(cm)** | **152** | **156** | **159** | **163** | **165** |
| **Y(Weight)(kg)** | **63** | **68** | **59** | **71** | **64** |

**1)find weight when height =173**

**2)find height when weight =70**

**Code :**

> X<-c(152,156,159,163,165)

> Y<-c(63,68,59,71,64)

> X

[1] 152 156 159 163 165

> Y

[1] 63 68 59 71 64

>

>

> relationYX<-lm(Y~X)

> print(relationYX)

Call:

lm(formula = Y ~ X)

Coefficients:

(Intercept) X

31.7545 0.2091

>

> relationXY<-lm(X~Y)

> print(relationXY)

Call:

lm(formula = X ~ Y)

Coefficients:

(Intercept) Y

141.6163 0.2674

>

> summaryXY=summary(relationXY)

> print(summaryXY)

Call:

lm(formula = X ~ Y)

Residuals:

1 2 3 4 5

-6.465 -3.802 1.605 2.395 6.267

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 141.6163 41.3225 3.427 0.0416 \*

Y 0.2674 0.6344 0.422 0.7017

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 5.884 on 3 degrees of freedom

Multiple R-squared: 0.05592, Adjusted R-squared: -0.2588

F-statistic: 0.1777 on 1 and 3 DF, p-value: 0.7017

>

> summaryYX=summary(relationYX)

> print(summaryYX)

Call:

lm(formula = Y ~ X)

Residuals:

1 2 3 4 5

-0.5364 3.6273 -6.0000 5.1636 -2.2545

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 31.7545 78.9010 0.402 0.714

X 0.2091 0.4960 0.422 0.702

Residual standard error: 5.202 on 3 degrees of freedom

Multiple R-squared: 0.05592, Adjusted R-squared: -0.2588

F-statistic: 0.1777 on 1 and 3 DF, p-value: 0.7017

>

> a=data.frame(X=173)

> result=predict(relationYX,a)

**Output:**

> print(paste("Weight of the student when Height=173 is ",result," kg"))

1. "Weight of the student when Height=173 is 67.9272727272727 kg"

>

> b=data.frame(Y=70)

> result1=predict(relationXY,b)

**Output:**

> print(paste("Height of the student when weight=70 is ",result1," cm"))

1. "Height of the student when weight=70 is 160.337209302326 cm"

>

> plot(Y,X,col="blue",main="Height and Weight of Students",xlab="Weight",ylab="Height",pch=15,abline(lm(X~Y)))

>

**Output:**

