Import data set

> library(readxl)

> lab\_data3 <- read\_excel("F:/Christ/lab-LRM-5CMS and EMS/lab assignments/lab-data3.xlsx")

> View(lab\_data3)

1. To find regression coefficients

mlrm=lm(sysBPY~ageX1+weightX2, data=lab\_data3)

> mlrm

Call:

lm(formula = sysBPY ~ ageX1 + weightX2, data = lab\_data3)

Coefficients:

(Intercept) ageX1 weightX2

30.9941 0.8614 0.3349

1. Obtain the predicted values of Y.

predicted\_bp=fitted.values(mlrm)

> predicted\_bp

1 2 3 4 5 6 7 8 9

133.7183 143.4317 153.6716 164.5327 151.7570 168.4078 140.4640 146.4939 156.3019

10 11

* 1. 165.6804

1. Find the values of residuals.

|  |
| --- |
| error\_terms=residuals(mlrm)  > error\_terms  1 2 3 4 5 6 7  -1.7183078 -0.4316617 -0.6715712 -2.5326657 2.2429545 -0.4078131 -3.4640251  8 9 10 11  2.5060721 2.6980886 1.4593355 0.3195938 |
|  |
| |  | | --- | | > | |

1. Test the significance of the regression coefficients at 5% of level of significance.

> summary(mlrm)

Call:

lm(formula = sysBPY ~ ageX1 + weightX2, data = lab\_data3)

Residuals:

Min 1Q Median 3Q Max

-3.4640 -1.1949 -0.4078 1.8511 2.6981

Coefficients:

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

(Intercept) 30.9941 11.9438 2.595 0.03186 \*

ageX1 0.8614 0.2482 3.470 0.00844 \*\*

weightX2 0.3349 0.1307 2.563 0.03351 \*

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

Residual standard error: 2.318 on 8 degrees of freedom

Multiple R-squared: 0.9768, Adjusted R-squared: 0.9711

F-statistic: 168.8 on 2 and 8 DF, p-value: 2.874e-07

1. Obtain the 95 percent and 99 percent confidence interval for partial regression coefficients and intercept term.

|  |
| --- |
| confint(mlrm, level=.95)  2.5 % 97.5 %  (Intercept) 3.45169598 58.5365099  ageX1 0.28899203 1.4338373  weightX2 0.03353762 0.6361808 |
|  |
| |  | | --- | |  | |

1. Is the overall regression model significant at 5% level of significance.

|  |
| --- |
| anova(mlrm)  Analysis of Variance Table  Response: sysBPY  Df Sum Sq Mean Sq F value Pr(>F)  ageX1 1 1778.62 1778.62 330.9619 8.566e-08 \*\*\*  weightX2 1 35.29 35.29 6.5673 0.03351 \*  Residuals 8 42.99 5.37  ---  Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1 |
|  |
| |  | | --- | | > | |

8.. Predict the systolic blood pressure for the age =40 and weight =200 and obtain the 95% CI for predicted BP.

newdata=data.frame(ageX1=40, weightX2=200)

> predict(mlrm, newdata)

1

132.4225

ci=predict(mlrm, newdata, interval="confidence", level=.95)

> ci

fit lwr upr

1 132.4225 118.0447 146.8003