STATISTICS FOR ENGINEERS

MAT2001

LAB TASK – 3

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REGISTRATION NO – **17BEC0656**

CLASS NO – **VL20191000424**

SLOT – **L49+L50**

FACULTY – **PROFESSOR SUJATHA V.**

Q. The following table shows the scores (X) of 10 students on Zoology test and scores (Y) on Botany test. The maximum score in each test was 50.

X	34	37	36	32	32	36	35	34	29	35
Y	37	37	34	34	33	40	39	37	36	35

Obtain and plot lines of regression.

Solution -

```
R version 3.6.1 (2019-07-05) -- "Action of the Toes"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

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'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

[Previously saved workspace restored]

> x=c(34,37,36,32,32,36,35,34,29,35)
> y=c(37,37,34,34,33,40,39,37,36,35)
> f=lm(x~y)
> f

Call:
lm(formula = x ~ y)

Coefficients:
(Intercept)            y
    18.9167       0.4167

> plot(f)
Waiting to confirm page change...
Waiting to confirm page change...
Waiting to confirm page change...
Waiting to confirm page change...
> g=lm(y~x)
> g

Call:
lm(formula = y ~ x)

Coefficients:
(Intercept)            x
    23.7769       0.3654

> plot(g)
Waiting to confirm page change...
Waiting to confirm page change...
Waiting to confirm page change...
Waiting to confirm page change...
```
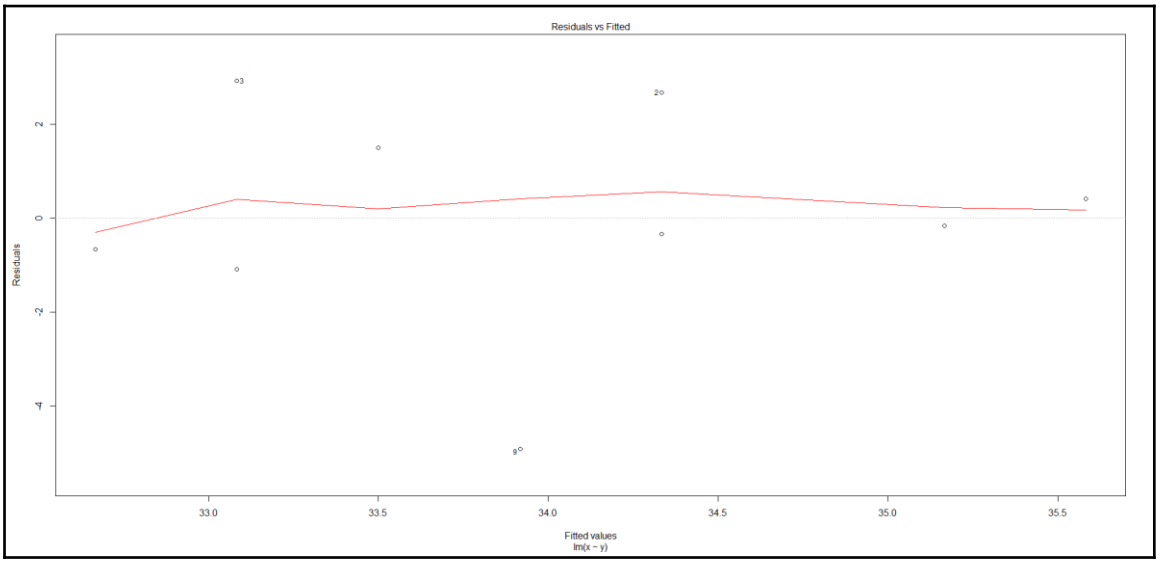
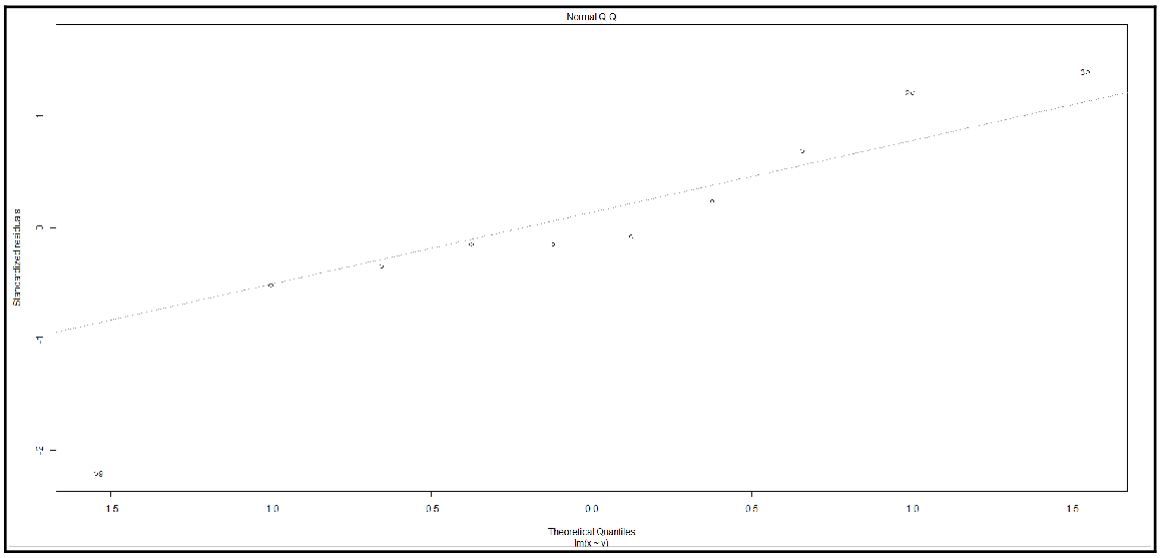
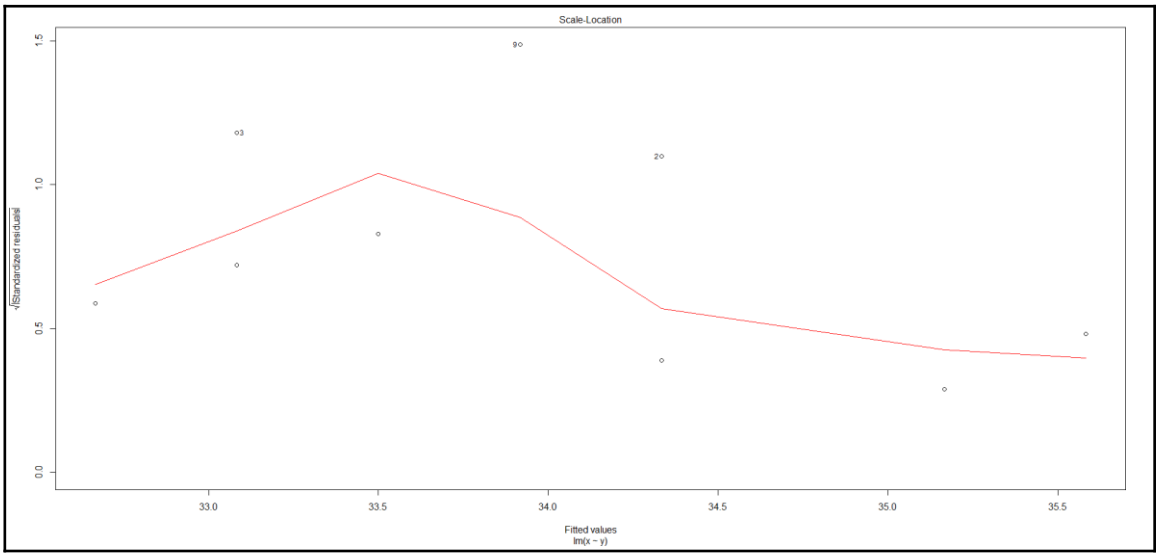
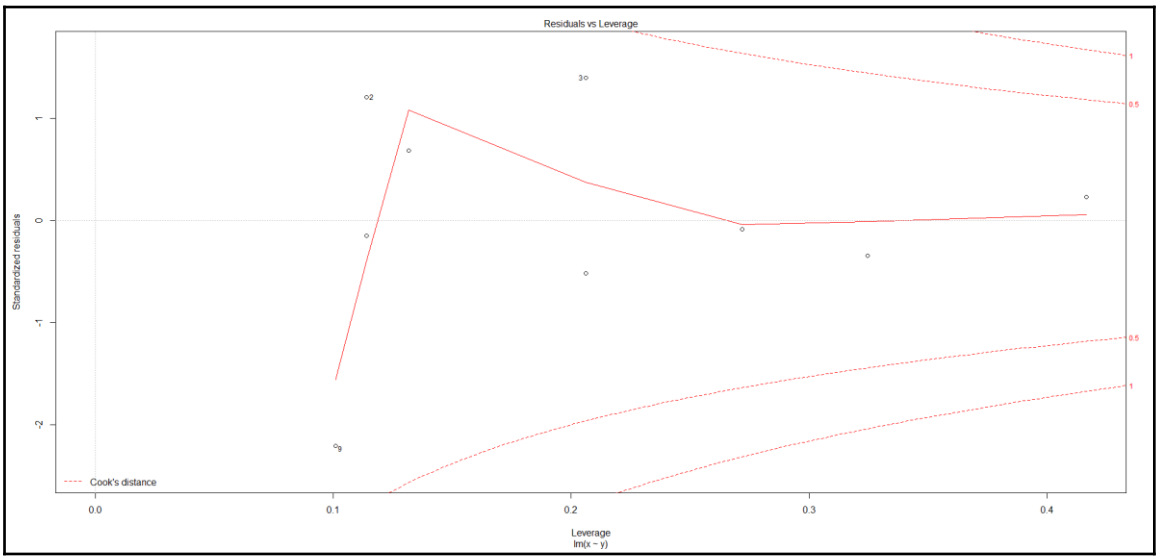
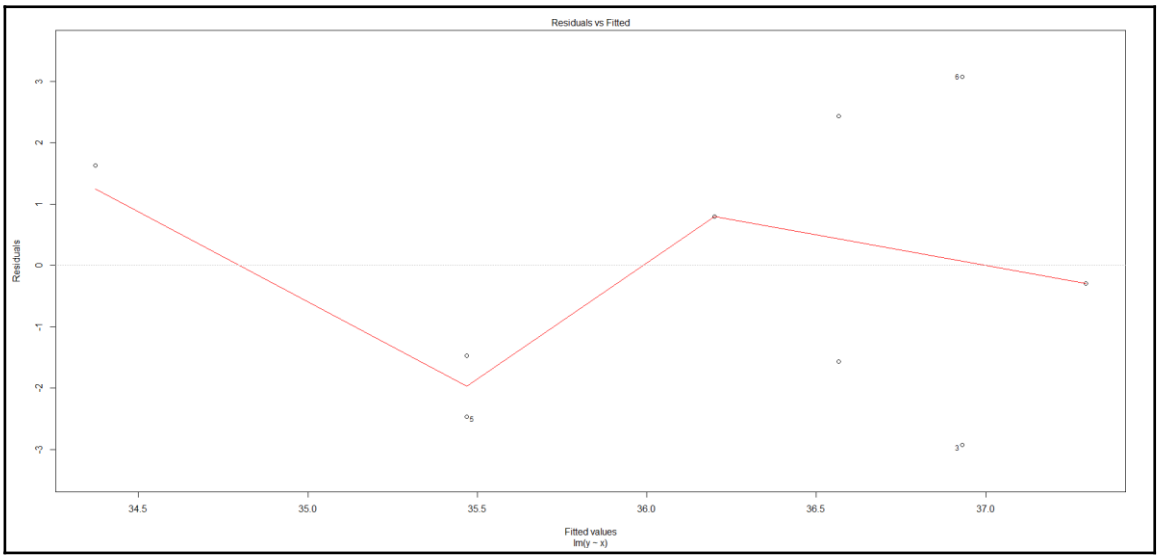
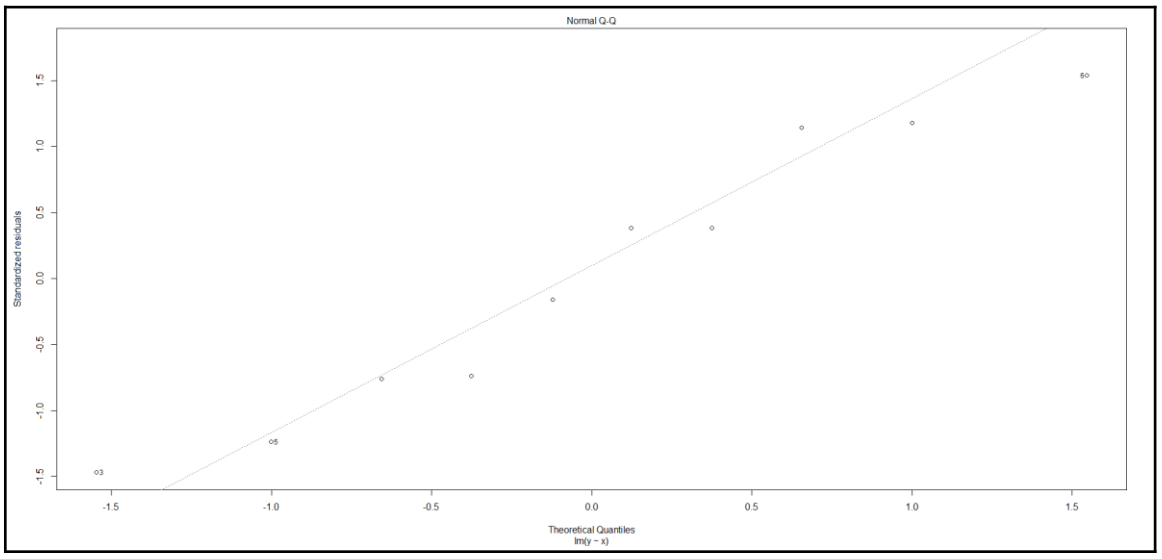


Residuals vs Fitted
Residuals
Fitted values
lm(x ~ y)

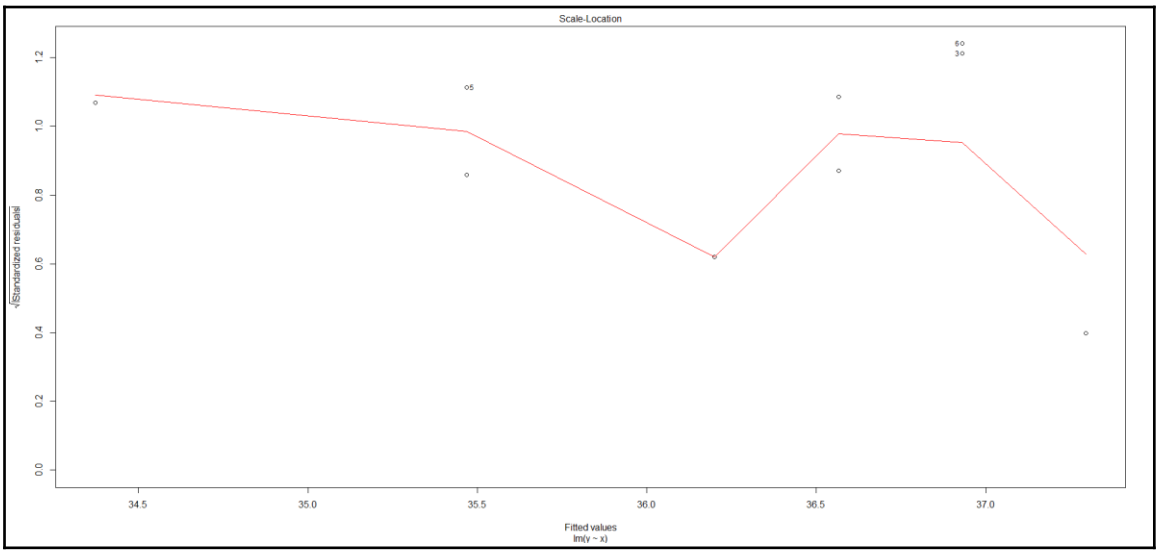

Normal Q-Q
Standardized residuals
Theoretical Quantiles
lm(x ~ y)

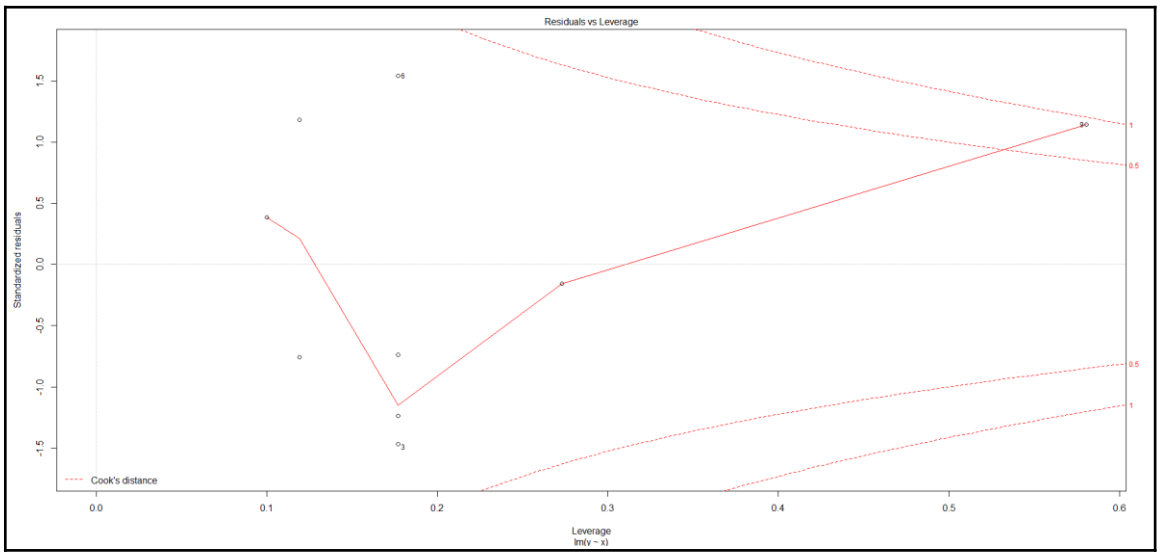

Scale-Location
√|Standardized residuals|
Fitted values
lm(x ~ y)


Residuals vs Leverage
Standardized residuals
Leverage
lm(x ~ y)
Cook's distance
0.5
1
3
2
9


Residuals vs Fitted
Residuals
Fitted values
lm(y ~ x)
6
5
3


Normal Q-Q
Standardized residuals
Theoretical Quantiles
lm(y ~ x)
6
5
3





Thus, the given data was fitted to the regression lines.

Regression mainly finds application in prediction.

On a broader scale, the regression is used in neural networks and AI for predict the output, by given inputs, thus training the neural network.