

Applied Statistical Methods

Digital Assignment 2

By MoeenUl Islam

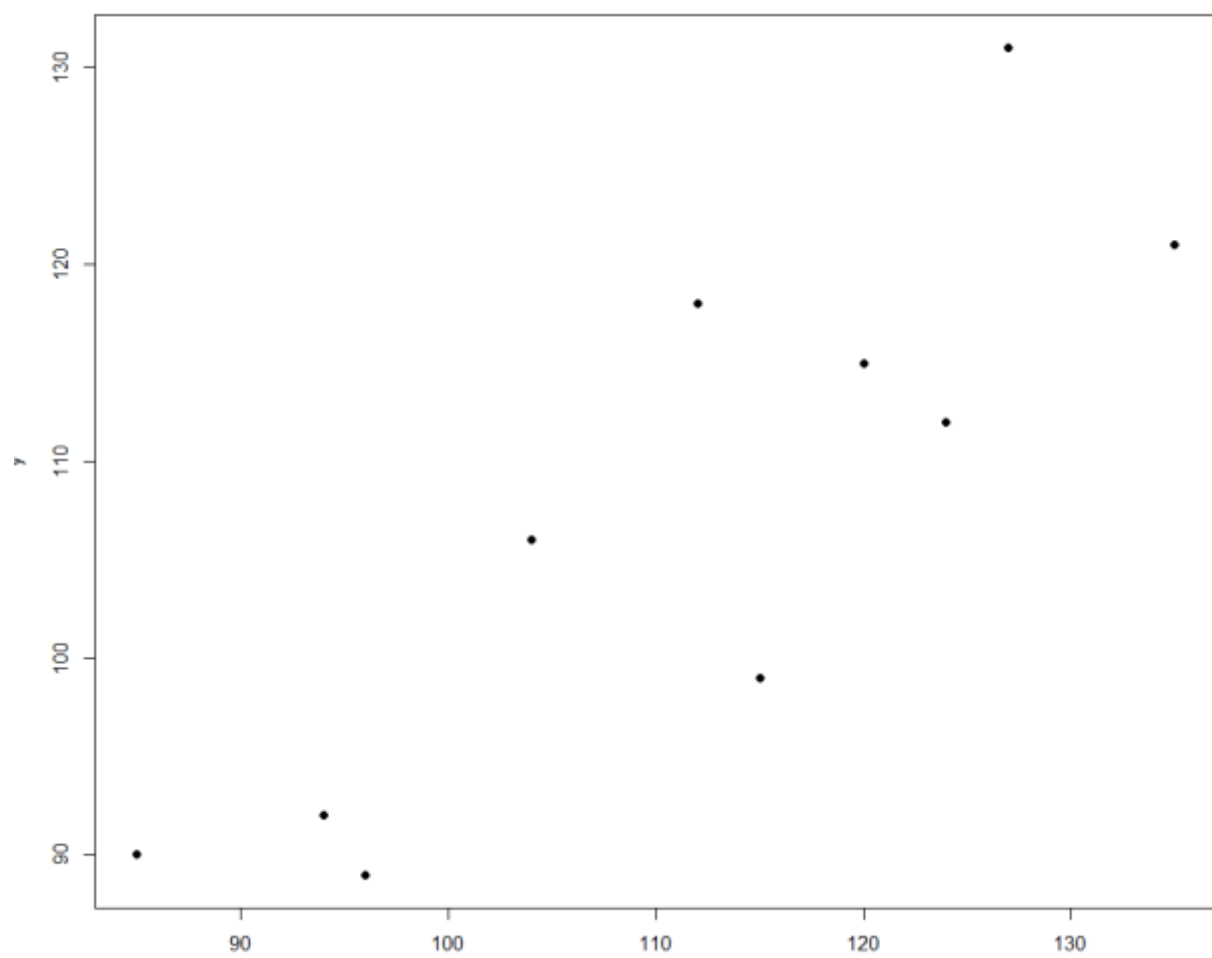
Roll no (21MCA0269)

Write the R-code for the following:

1. The following data represents the I.Q scores of 10 mothers and their eldest daughters.

| | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| Mother's I.Q (x) | 135 | 127 | 124 | 120 | 115 | 112 | 104 | 96 | 94 | 85 |
| Daughter's I.Q (y) | 121 | 131 | 112 | 115 | 99 | 118 | 106 | 89 | 92 | 90 |

```
1 "MoeenUl Islam"
2 "QUESTION 1"
3 x = c(135,127,124,120,115,112,104,96,94,85)
4 y = c(121,131,112,115,99,118,106,89,92,90)
5
6
7 "i) Draw the Scatter diagram"
8 plot(x, y, pch=19, col="black")
9 #plot(x, y, pch=19, col="black", type = "h")
10
11
12 "ii) Calculate correlation coefficient 'r'"
13 cor(x, y)
14
```



```
> cor(x, y)
[1] 0.8621791
> |
```

```
"iii) Obtain regression lines of 'x' on 'y' and 'y' on 'x'"  
"regression line of x on y"  
abline(lm(x ~ y))
```

```
> lm(x ~ y)
```

```
Call:  
lm(formula = x ~ y)
```

```
Coefficients:  
(Intercept)          y  
      8.1542       0.9604
```

```
29
30 "iv) Estimate the value of 'y' when 'x = 50'"
31 x = 50;
32 y = 0.774 * x + 21.227
33
```

```
> x = 50;
> y = 0.774 * x + 21.227
> y
[1] 59.927
> |
```

2. Calculate the correlation coefficient between X and Y and comment on their relationship

| | | | | | | |
|---|---|---|---|----|----|----|
| X | 1 | 3 | 4 | 5 | 7 | 8 |
| Y | 2 | 6 | 8 | 10 | 14 | 16 |

```
36 "QUESTION 2"
37 X = c(1,3,4,5,7,8)
38 Y = c(2,6,8,10,14,16)
39
40 cor(X, Y)
41 "X and Y are highly positively correlation because the coefficient of correlation is 1"
```

```
> cor(X, Y)
[1] 1
```

X and Y are highly positively correlated because the coefficient of correlation is 1

3. The grades of a class of 9 students on a midterm report (x) and on the final examination (y) are as follows:

| | | | | | | | | | |
|---|----|----|----|----|----|----|----|----|----|
| X | 77 | 50 | 71 | 72 | 81 | 94 | 96 | 99 | 67 |
| Y | 82 | 66 | 78 | 34 | 47 | 85 | 99 | 99 | 68 |

```

45 "QUESTION 3"
46 X = c(77,50,71,72,81,94,96,99,67)
47 Y = c(82,66,78,34,47,85,99,99,68)
48
49 "i) calculate the linear regression line"
50 abline(lm(X ~ Y))
51 abline(lm(Y ~ X))
52 X = 0.405 * Y + 48.947
53 Y = 0.7771 * X + 12.0623
54
55 "ii)Final exam grade of student whose midterm marks = 85"
56 x = 85
57 y = 0.7771 * x + 12.0623
58 y

```

```

[1] "QUESTION 3"
> X = c(77,50,71,72,81,94,96,99,67)
> Y = c(82,66,78,34,47,85,99,99,68)
>
> "i) calculate the linear regression line"
[1] "i) calculate the linear regression line"
> abline(lm(X ~ Y))
> abline(lm(Y ~ X))
> X = 0.405 * Y + 48.947
> Y = 0.7771 * X + 12.0623
>
> "ii)Final exam grade of student whose midterm marks = 85"
[1] "ii)Final exam grade of student whose midterm marks = 85"
> x = 85
> y = 0.7771 * x + 12.0623
> y
[1] 78.1158

```