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## MATHS STATS LAB5

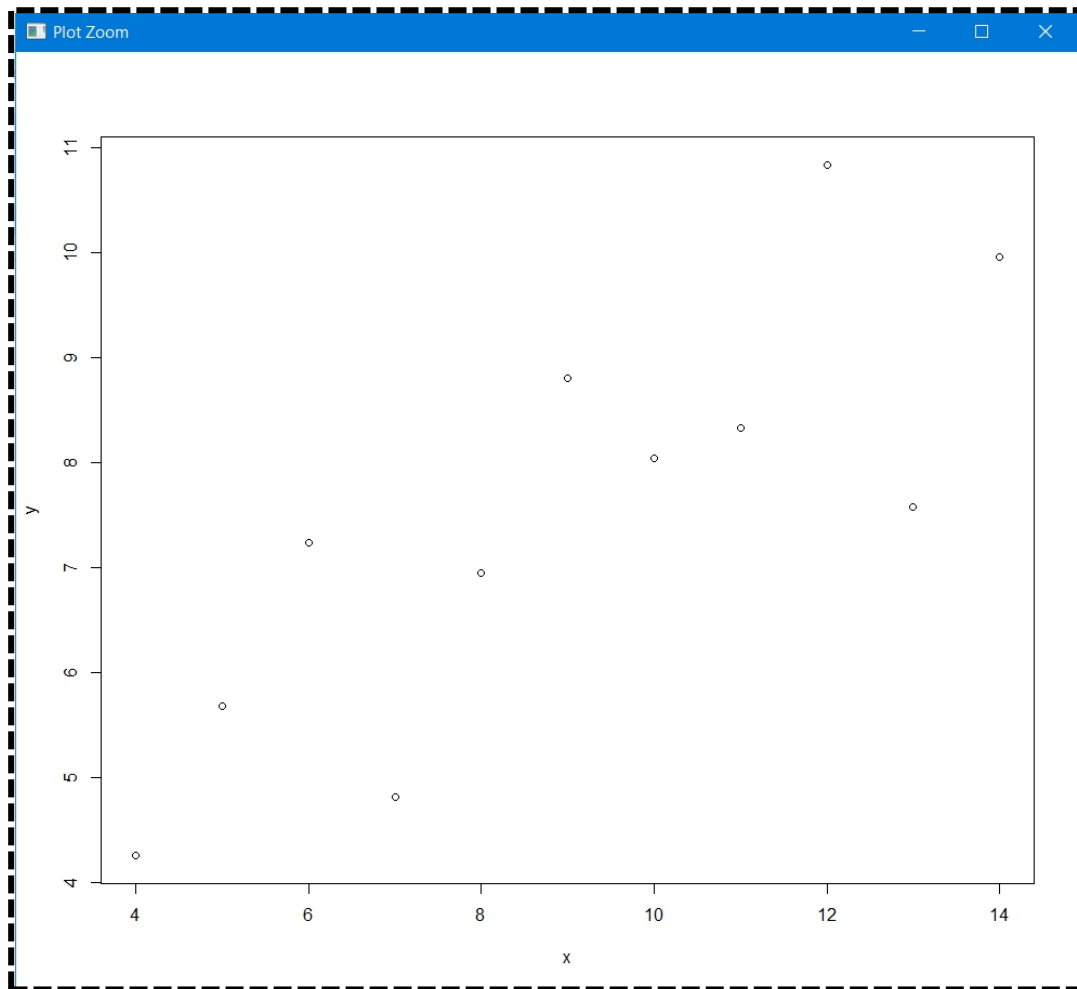
### OUTPUTS

SELECTING A DATASET CALLED “ANSCOMBE”.  
FINDING THE DIMENSIONS OF THE TABLE.  
ATTACHING THE FEATURES OF THE DATA SET TO R STUDIO.  
PLOTING A GRAPH WITH X=X1 AND Y=Y1.

```
Console Terminal x Jobs x
~/
> datasets::anscombe
  x1 x2 x3 x4    y1    y2    y3    y4
1  10 10 10  8  8.04 9.14  7.46  6.58
2   8  8  8  8  6.95 8.14  6.77  5.76
3  13 13 13  8  7.58 8.74 12.74  7.71
4   9  9  9  8  8.81 8.77  7.11  8.84
5  11 11 11  8  8.33 9.26  7.81  8.47
6  14 14 14  8  9.96 8.10  8.84  7.04
7   6  6  6  8  7.24 6.13  6.08  5.25
8   4  4  4 19  4.26 3.10  5.39 12.50
9  12 12 12  8 10.84 9.13  8.15  5.56
10   7  7  7  8  4.82 7.26  6.42  7.91
11   5  5  5  8  5.68 4.74  5.73  6.89
> dim(anscombe)
[1] 11  8
> attach(anscombe)
> x=x1
> y=y1
> plot(x,y)
>
```

### THE GRAPH





### FINDING THE REGRESSION BETWEEN X AND Y DRAWING THE REGRESSION LINE

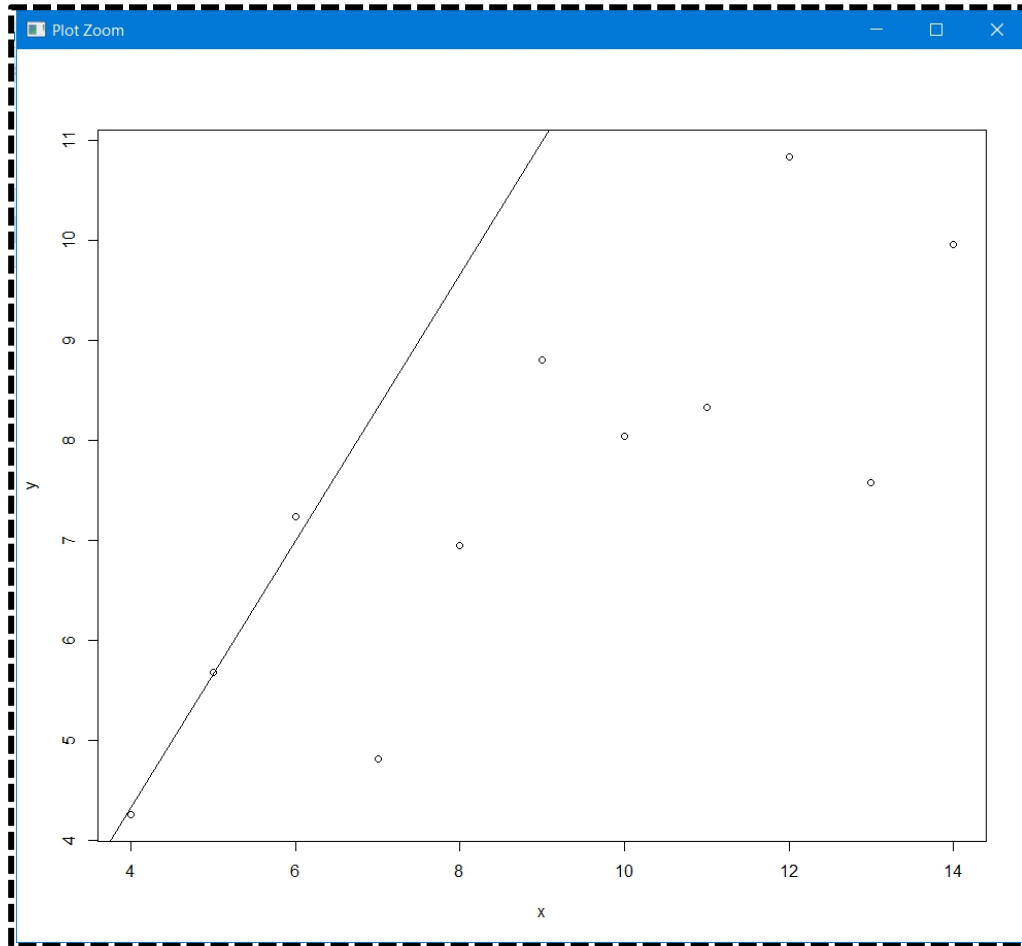
```
Console  Terminal x  Jobs x
~/ ➔
> regs1<-lm(x~y)
> regs1

Call:
lm(formula = x ~ y)

Coefficients:
(Intercept)          y
    -0.9975         1.3328

> abline(regs1)
> |
```

## THE GRAPH



## PREDICTING X USING Y

```
> #Predicting x using y
> predictionx=regs1$coefficients[2]*y+regs1$coefficients[1]
> predictionx
[1] 9.718523 8.265725 9.105416 10.744812 10.105048 12.277581 8.652249 4.680378 13.450483 5.426770
[11] 6.573015
> x
[1] 10 8 13 9 11 14 6 4 12 7 5
> |
```

## FINDING THE REGRESSION BETWEEN Y AND X DRAWING THE REGRESSION LINE

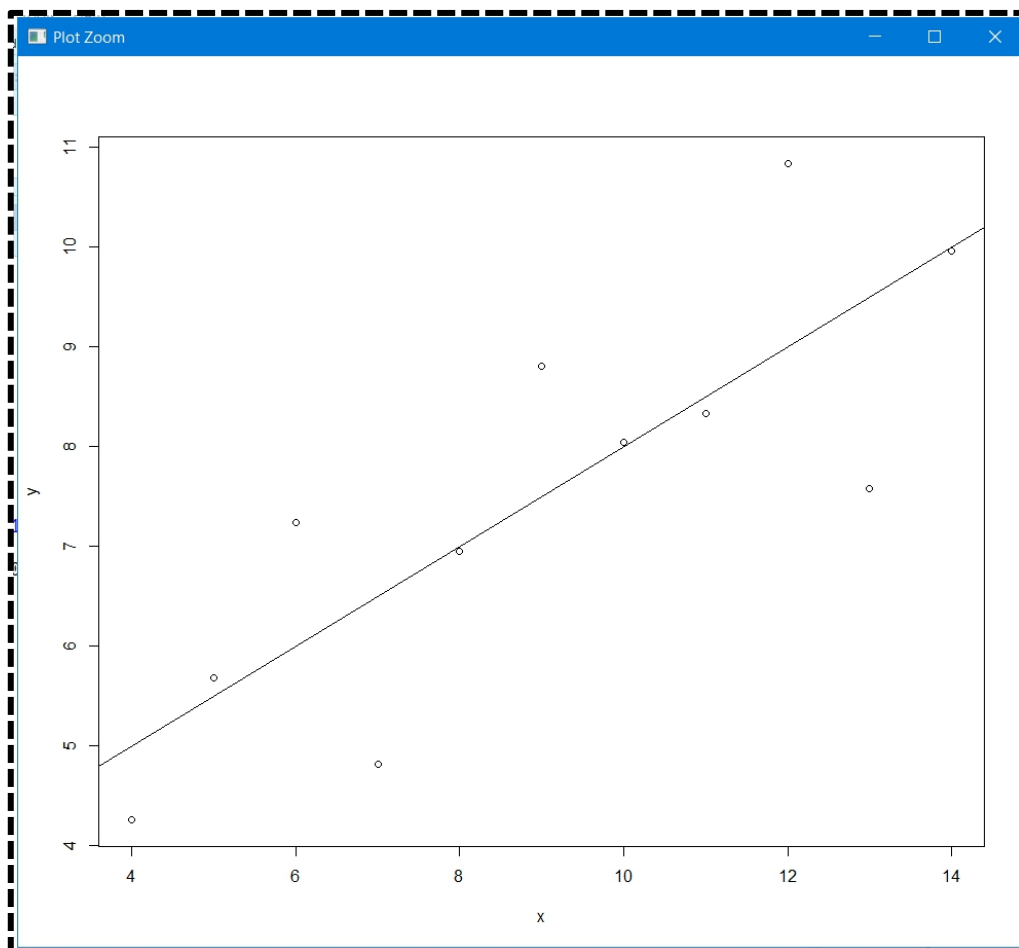
```
Console Terminal x Jobs x
~/
> regs1<-lm(y~x)
> regs1

Call:
lm(formula = y ~ x)

Coefficients:
(Intercept)          x
      3.0001         0.5001

> abline(regs1)
```

## THE GRAPH



## NOW PREDICTING Y USING X

```
Console Terminal x Jobs x
~/
> predictiony=regs1$coefficients[2]*x+regs1$coefficients[1]
> predictiony
[1] 8.001000 7.000818 9.501273 7.500909 8.501091 10.001364 6.000636 5.000455 9.001182 6.500727
[11] 5.500545
> y
[1] 8.04 6.95 7.58 8.81 8.33 9.96 7.24 4.26 10.84 4.82 5.68
> |
```

## INTRODUCING A NEW VARIABLE Z=Y<sup>2</sup> FINDING MULTIPLE REGRESSION BETWEEN X, Y, AND Z

```
Console Terminal x Jobs x
~/
> # Multiple Regression
> z=y2
> da=data.frame(x,y,z)
> regl<-lm(x~y+z,data=da)
> regl

Call:
lm(formula = x ~ y + z, data = da)

Coefficients:
(Intercept)           y           z
      -2.4242       0.7621       0.7609

> lm(formula=x~y+z,data=da)#Alternative

Call:
lm(formula = x ~ y + z, data = da)

Coefficients:
(Intercept)           y           z
      -2.4242       0.7621       0.7609

> |
```

## SUMMARY OF THE OBJECT STORING THE MULTIPLE REGRESSION BETWEEN X, Y, AND Z

```
Console Terminal x Jobs x
~/
> summary(reg1)

Call:
lm(formula = x ~ y + z, data = da)

Residuals:
    Min       1Q   Median       3Q      Max
-1.9634 -0.9254 -0.5114  0.5226  2.9969

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  -2.4242     2.3249   -1.043   0.328
y              0.7621     0.4261    1.789   0.111
z              0.7609     0.4261    1.786   0.112

Residual standard error: 1.811 on 8 degrees of freedom
Multiple R-squared:  0.7616,    Adjusted R-squared:  0.702
F-statistic: 12.78 on 2 and 8 DF,  p-value: 0.003231
```

## BOTH THE REGRESSION LINES (X~Y AND Y~X) IN ONE GRAPH

