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EXPERIMENT: -2

SLOT: -L15 +L16

COURSE: - MAT2001

1) Write down the R code to compute the coefficient of correlation between X and Y from the following data:

X	21	23	30	54	57	58	72	78	87	90
Y	60	71	72	83	110	84	100	92	113	135

CODE: -

```
x=c(21,23,30,54,57,58,72,78,87,90)
```

```
> y=c(60,71,72,83,110,84,100,92,113,135)
```

```
> var(x)
```

```
[1] 649.5556
```

```
> var(y)
```

```
[1] 520.8889
```

```
> var(x,y)
```

```
[1] 510.4444
```

```
> r=var(x,y)/sqrt(var(x)*var(y))
```

```
> r
```

[1] 0.8775417

2. Write down the R code to obtain the equation of the regression line of X on Y from the following data:

X	4.	8.	12.	15.	20.	24.	31.	35.	39.	38.	
	7	2	4	8	7	9	9	0	1	8	
Y	4.	8.	12.	16.	20.	25.	31.	36.	40.	40.	
	0	0	5	0	0	0	0	0	0	0	

CODE: -

```
x=c(4.7,8.2,12.4,15.8,20.7,24.9,31.9,35.0,39.1,38.8)
```

```
> y=c(4.0,8.0,12.5,16.0,20.0,25.0,31.0,36.0,40.0,40.0)
```

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

```
> fit
```

Call:

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

Coefficients:

(Intercept)	y
0.7508	0.9634

```
> the equation of line of regression of x and y is x=0.7508+0.963.
```

3. Write down the R code to obtain the equation of the regression plane of Y on X1 and X2 from the following data:

X1	30	40	20	50	60	40	20	60
X2	11	10	7	15	19	12	8	14
Y	110	80	70	120	150	90	70	12

Code: -

```
y=c(110,80,70,120,150,90,70,12)
```

```
> x1=c(30,40,20,50,60,40,20,60)
```

```
> x2=c(11,10,7,15,19,12,8,14)
```

```
> input_data=data.frame(y,x1,x2)
```

```
> input_data
```

```
  y x1 x2
1 110 30 11
2  80 40 10
3  70 20  7
4 120 50 15
5 150 60 19
6  90 40 12
7  70 20  8
8  12 60 14
```

```
> regmodel<-lm(y~x1+x2,data=input_data)
```

```
> regmodel
```

Call:

```
lm(formula = y ~ x1 + x2, data = input_data)
```

Coefficients:

(Intercept)	x1	x2
8.355	-4.514	21.663

```
> summary(regmodel)
```

```
> # NOW THE REGRESSION MODEL IS=  $Y = 8.355 - 4.514 \cdot X_1 + 7.8488 \cdot X_2$ 
```