Practical 10

Linear Regression

Ex. 1 *The number of bacterial cells (y) per unit volume in a culture at different hours (x) is given below:*

x	0	1	2	3	4	5	6	7	8	9
y	43	46	82	98	123	167	199	213	245	272

Fit lines of regression of y on x and x on y. Also, estimate the number of bacterial cells after 15 *hours.*

CODE:

```
x = c(0, 1, 2, 3, 4, 5, 6, 7, 8, 9 )
y = c(43, 46, 82, 98, 123, 167, 199, 213, 245, 272)
relation1 = lm(y~x)
relation1
summary(relation1)
relation2 = lm(x~y)
relation2
summary(relation2)
```

```
png(file = "linearregression.png")
plot(y, x, col = "blue", main = "x & y Regression", abline(lm(x~y)),
xlab = "x", ylab = "y")
dev.off()
```

Ex. 2

CODE:

```
 P = c(0, 1, 2, 3, 4, 5, 6, 7, 8, 9 )
 Y = c(43, 46, 82, 98, 123, 167, 199, 213, 245, 272)
 relation1 = lm(Y~P)
 relation1

png(file = "linearregression.png")

plot(Y, P, col = "blue", main = “X & P Regression", abline(lm(P~Y)),

xlab = “P", ylab = “Y")

dev.off()
```