



Exam No. :

Class :

Subject:

Date :

(M)

## Digital Assignment - 2

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Find regression equation for following data.

X	6	2	10	4	8
Y	9	11	5	8	7

X	Y	$X - \bar{X}$	$Y - \bar{Y}$	$(X - \bar{X})(Y - \bar{Y})$	$(X - \bar{X})^2$	$(Y - \bar{Y})^2$
6	9	0	1	0	0	1
2	11	-4	3	-12	16	9
10	5	4	-3	-12	16	9
4	8	-2	0	0	4	0
8	7	2	-1	-2	4	1
30	40	0	0	-26	40	20

$$\bar{X} = \frac{\sum X}{n} = \frac{6+2+10+4+8}{5} = 30/5 = 6$$

$$\bar{Y} = \frac{\sum Y}{n} = \frac{9+11+5+8+7}{5} = 40/5 = 8$$

$$b_{XY} = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sum (Y - \bar{Y})} = -26/20 = -1.3$$



$$b_{yx} = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})} \Rightarrow -26/40 = -0.65$$

Regression equation.

①  $x$  depends on  $y$ :  $(x - \bar{x}) = b_{xy}(y - \bar{y})$

$$x - 6 = -1.3(y - 8)$$

$$x - 6 = -1.3y + 10.4$$

$$x = -1.3y + 10.4 + 6$$

$$x = -1.3y + 16.4$$

②  $y$  depends on  $x$ :  $(y - \bar{y}) = b_{yx}(x - \bar{x})$

$$y - 8 = -0.65(x - 6)$$

$$y - 8 = -0.65x + 3.9$$

$$y = -0.65x + 3.9 + 8$$

$$y = -0.65x + 11.9$$

② If  $A$  and  $B$  are independent and  $P(A) = 1/3$ ,  $P(B) = 1/4$ , then  $P(A \cap B)$ ?

Solution

If  $A$  and  $B$  are independent then



$$P(A \cap B) = P(A) \cdot P(B)$$

$$\Rightarrow \frac{1}{3} \times \frac{1}{4}$$

$$P(A \cap B) = \frac{1}{12}$$

- ③ If from a pack of cards a single card is drawn what is the Probability that it is either Spade or a King?

$$P(A) = \frac{13}{52} \quad | \quad P(B) = \frac{4}{52}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$\Rightarrow \frac{13}{52} + \frac{4}{52} - \frac{1}{52}$$

$$P(A \cup B) = \frac{16}{52} \Rightarrow \frac{4}{13}$$

- ④ On a New Year's eve, the probability of a person having car accident is 0.09. The probability of a person driving while intoxicated is 0.32 and Probability of a person having a car accident while intoxicated is 0.15 what is the probability of a person driving while intoxicated or having a car accident



(1)

$$P(A) = 0.09$$

$$P(B) = 0.32$$

$$P(A \cap B) = 0.15$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$\Rightarrow 0.09 + 0.32 - 0.15$$

$$P(A \cup B) = 0.26$$