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Class test - 2

1| a) Here,

Years of experience (~~Independent~~) = x

Amount of sales = y

We know,

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{\left[n\sum x^2 - (\sum x)^2\right]\left[n\sum y^2 - (\sum y)^2\right]}}$$

$$= 0.9688$$

So there is strong positive linear relationship between x and y.

b) Here,

Years of experience is independent, x

Amount of sales is dependent, y

$$\therefore b = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2} = \$(9.99 \times 1000) = \$9990/\text{year}$$

If the years of experience is increased by 1 year, the amount of sales will be increased by \$ 4490.

$a = \frac{\Sigma y}{n} - b\frac{\Sigma x}{n} = \$(74.77 \times 1000) = \$74,770$

If there is no effect of xony, then the amount of sales is \$ 74,770.

$\therefore \hat{y} = 74.77 + 4.49x$

e) Given,

experience of worker, $x = 9$

Then, $\hat{y} = 74.77 + 4.49 \times 9$

$= \$(115.188 \times 1000) = \$115,180.$

2) Given,

$\lambda = 3$ visitors per minute

$\therefore P[X=0] = \frac{e^{-\lambda}\lambda^x}{x!} = 0.05$

b] Here,

$$\lambda = \frac{3}{2} \text{ visitors per 30 sec}$$

$$P[X \geq 1] = \frac{e^{-\lambda}\lambda^{x}}{x!} = 0.377$$

3] a] $P[X=5] = 0.15$

b] $P[X>3] = 0.65$

c] $P[X=4 \mid X \leq 7] = \frac{P[X=4 \cap X \leq 7]}{P[x \leq 7]}$

$$= \frac{0.2}{0.70} = 0.29$$

d] Mean $= \Sigma(x \times P(x))$

$= 4.8$

1) a) Here,

$$p = 0.8, \quad n = 1$$

$$\therefore P[X=1] = {}^{1}C_{1}\,(0.8)^{1}\,(1-0.8)^{1-1} = 0.8$$

b) Here,

$$p = 0.8, \quad n = 2$$

$$\therefore P[X \geq 1] = 1 - P(0) = 0.96$$