Assignment-2

CS21BTECH11056

May 16, 2022

Question

Question 20(b)
From the given data :

Variable	x	y
Mean	6	8
Standard Deviation	4	6

and correlation coefficient : $\frac{2}{3}$ Find :
(i) Regression coefficient b_{yx} and b_{xy}
(ii) Regression line x on y
(ii) Most likely value of x when y $= 14$

Solution :

$\bar{x} = 6$, $\bar{y} = 8$
$\sigma_x = 4$, $\sigma_y = 6$
$r = \frac{2}{3}$

$$b_{yx} = r.\frac{\sigma_y}{\sigma_x} = \frac{2}{3}.\frac{6}{4} = 1 \quad (1)$$

$$b_{xy} = r.\frac{\sigma_x}{\sigma_y} = \frac{2}{3}.\frac{4}{6} = \frac{4}{9} \quad (2)$$

Regression equation x on y

$$x - \bar{x} = bxy(y - \bar{y})$$
$$x - 6 = \frac{4}{9}(y - 8)$$
$$9x - 54 = 4y - 32$$
$$9x - 4y = 22$$

When y = 14 ,

$$(9x - 4)14 = 22$$
$$9x = 78$$
$$x = 8.67$$

Graph :

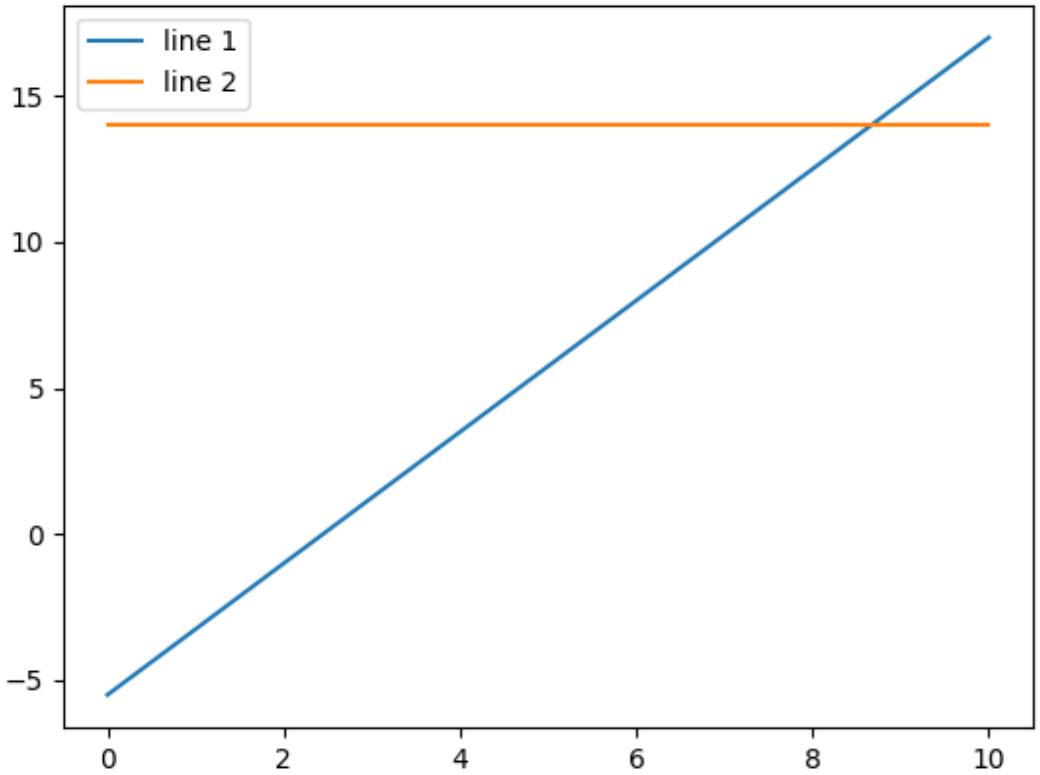

Figure: Finding the intersection point