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IML assignment - 2

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(2)

x	y	$x-\bar{x}$	$y-\bar{y}$	$(x-\bar{x})^2$	$(y-\bar{y})^2$	$(x-\bar{x})(y-\bar{y})$
85	82	2.2	-2.9	4.84	8.41	-6.38
90	88	7.2	3.1	51.84	9.61	22.32
93	96	10.2	11.1	104.04	123.21	113.22
65	72	-17.8	-12.9	316.84	166.41	229.62
87	91	4.2	6.1	17.64	37.21	25.62
71	80	-11.8	-4.9	139.24	24.01	57.82
98	95	15.2	10.1	231.04	102.01	153.52
68	72	-14.8	-12.9	219.04	166.41	190.92
84	89	1.2	4.1	1.44	16.81	4.92
87	84	4.2	-0.9	17.64	0.81	-3.78

$\bar{x} = 82.8$

$\bar{y} = 84.9$

(a) $Y = w_0 + w_1 x$

$$w_1 = \frac{\Sigma (x-\bar{x})(y-\bar{y})}{\Sigma (y-\bar{x})^2} = \frac{787.8}{1103.6} = 0.713846$$

$\therefore \quad w_0 = \bar{y}_1 - w_1 \bar{x} = 26.112$

$\therefore \quad Y = 26.11 + (0.71)x$.

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(b) $x = w_0 + w_1 y$

$$w_1 = \frac{\Sigma (x-\bar{x})(y-\bar{y})}{\Sigma (y-\bar{y})^2} = \frac{787.8}{654.9}$$

$$= 1.20$$

$$w_0 = \bar{x} - w_1 \bar{y} = 82.8 - (1.2)(84.9)$$

$$= -19.08$$

$$\therefore x = (1.20) y - 19.08$$

(c) from $y = 26.11 + (0.71) x$

$$= 26.11 + (0.71) \times 96$$

$$\therefore y = 94.27$$

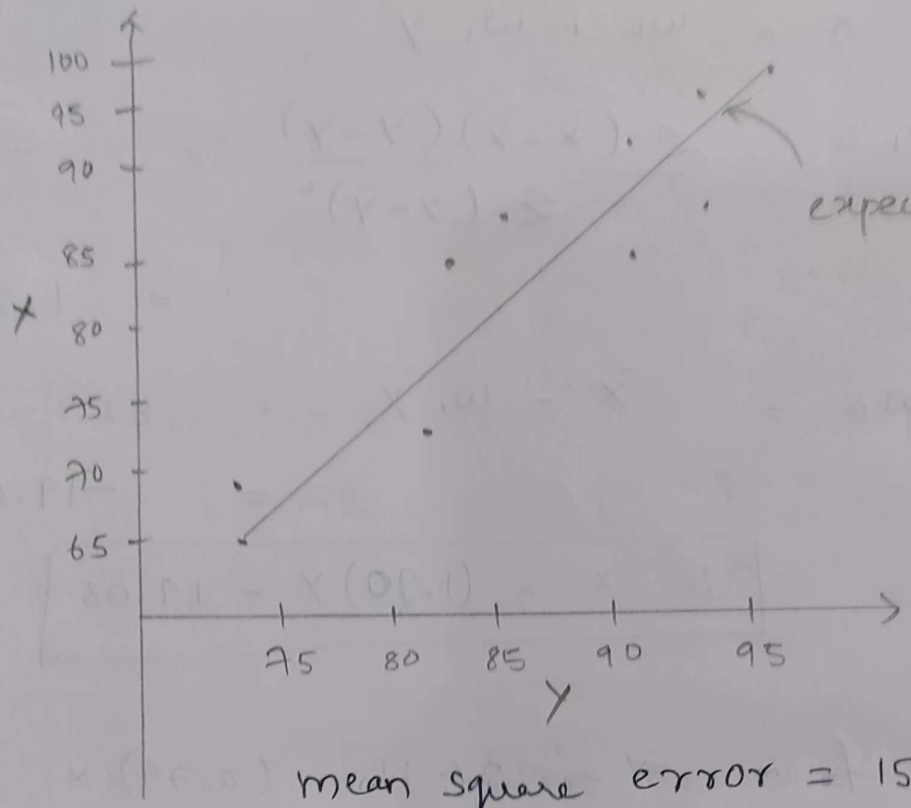
(d) from $x = (1.20) y - 19.08$

$$= (1.2)(95) - 19.08$$

$$\therefore x = 94.92$$

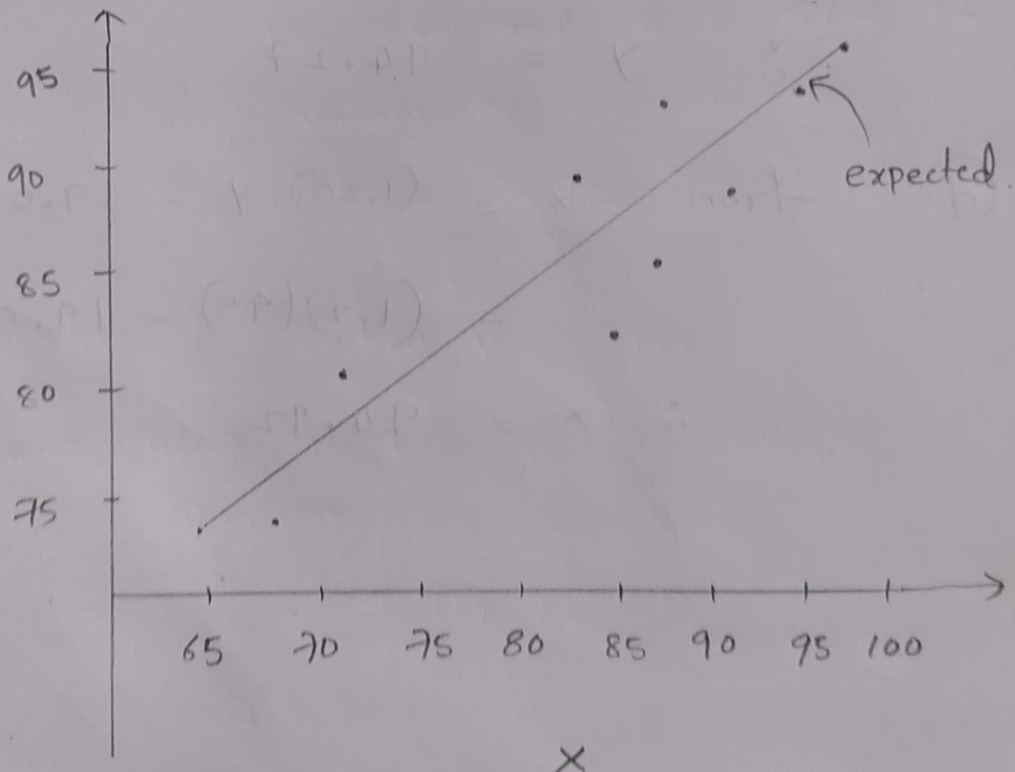
(e)

b Part



mean square error = 15.5936

a Part



Mean Square error = 9.25488