manuality

Problem

x hours of study	y score
2	50
3	60
5	80
7	90
9	100

For mean

$$\mu = \frac{1}{n}\sum_{i=1}^{n} X_i$$

Step 1: Compute for mean

$$\bar{x} = \frac{2+3+5+7+9}{5}$$

$$\bar{x} = \frac{26}{5}$$

$$\boxed{\bar{x} = 5.2}$$

For $\bar{y}$:

$$\bar{y} = \frac{50+60+80+90+100}{5}$$

$$\bar{Y} = \frac{380}{5}$$

$$\boxed{\bar{y} = 76}$$

Step 2: Compute for

formulas

$$X'(x-\bar{x})$$

$$Y'(y-\bar{y})$$

$$X'(x-\bar{x})$$

$$2-5.2 = -3.2$$

$$3-5.2 = -2.2$$

$$5-5.2 = -0.2$$

$$7-5.2 = 1.8$$

$$9-5.2 = 3.8$$

$$
\begin{aligned}
Y'(y-\bar{y}) \\
50-76=26 \\
60-76=16 \\
80-76=4 \\
90-76=14 \\
100-76=24
\end{aligned}
$$

step 4: Sum of the products

Formula:

$$\sum(x-\bar{x})(y-\bar{y})$$

$$\sum(x-\bar{x})(y-\bar{y})=83.2+35.2+-0.8+25.2+91.2\boxed{\sum(x-\bar{x})(y-\bar{y})=234}$$

Step 5: Compute for slope

Formula:

$$\sum(x-\bar{x})^2$$

$$
\begin{aligned}
\sum(x-\bar{x})^2=(-3.2)^2+(-2.2)^2+(-0.2)^2+(1.8)^2+(3.8)^2 \\
\sum(x-\bar{x})^2=1024+4.84+0.04+3.24+14.44 \\
\sum(x-\bar{x})^2=32.8
\end{aligned}
$$

Step 6: get the B_1 and B_0

$$B_1=\frac{\sum(x-\bar{x})(y-\bar{y})}{\sum(x-\bar{x})^2}$$

$$B_1=\frac{234}{32.8}$$

$$\boxed{B_1=7.13}$$

FOR B_0:

$$
\begin{aligned}
B_0=\bar{y}-B_1\bar{x} \\
B_0=(76)-(7.13)(5.2) \\
\boxed{B_0=38.9}
\end{aligned}
$$

Final:

$$Y = B_0 + B_1 X$$

$$Y = 38.9 + 7.13X :$$

$$Y = 38.9 + 7.13(2) = 53.16$$

$$Y = 38.9 + 7.13(3) = 60.29$$

$$Y = 38.9 + 7.13(5) = 74.55$$

$$Y = 38.9 + 7.13(7) = 88.91$$

$$Y = 38.9 + 7.13(9) = 103.07s$$

Final table

x hours of study	y score	$X'(x - \bar{x})$	$Y'(y - \bar{y})$
2	50	-3.2	26
3	60	-2.2	16
5	80	-0.2	4
7	90	1.8	14
9	100	3.8	24

Hours of Study (X)	Calculation	Predicted (Y) (Score)
2	(38.9 + 7.13(2))	**53.16**
3	(38.9 + 7.13(3))	**60.29**
5	(38.9 + 7.13(5))	**74.55**
7	(38.9 + 7.13(7))	**88.81**
9	(38.9 + 7.13(9))	**103.07**