	Actual					Predicted			
x	y	$x-\bar{x}$	$y-\bar{y}$	$(x-\bar{x})\cdot(y-\bar{y})$	$(x-\bar{x})^2$	$\hat{y}$	$(y-\bar{y})^2$	$\hat{y}-\bar{y}$	$(\hat{y}-\bar{y})^2$
1	2	-2	-2	4	4	2.8	4	-1.2	1.44
2	4	-1	0	0	1	3.4	0	-0.6	0.36
3	5	0	1	0	0	4	1	0	0
4	4	1	0	0	1	4.6	0	0.6	0.36
5	5	2	1	2	4	5.2	1	1.2	1.44
mean $\bar{x}=3$	$\bar{y}=4$			$\Sigma(x-\bar{x})(y-\bar{y})=6$	$\Sigma=10$		$\Sigma=6$		$\Sigma=3.6$

$y = b_1x + b_0$

1. $\bar{x}$ (mean of x)

$$\bar{x} = \frac{1+2+3+4+5}{5} = 3$$

2. $$\bar{y} = \frac{2+4+5+4+5}{5} = 4$$

$$b_1 = \frac{\Sigma(x-\bar{x})\cdot(y-\bar{y})}{\Sigma(x-\bar{x})^2} = \frac{6}{10} = 0.6$$

$$\boxed{b_1 = 0.6}$$

$b_0 = \bar{y} - b_1\bar{x}$

$\bar{y}$ = mean of y

$\bar{x}$ = mean of x

$$b_0 = 4 - 0.6 \times 3 = 4 - 1.8$$

$$\boxed{b_0 = 2.2}$$

$$\boxed{y = 0.6x + 2.2} \rightarrow \text{model}$$

x

$R^2 =$

3. $\hat{y}$ Predicted

$x=1$
$\hat{y} = 0.6 \times 1 + 2.2 = 2.8$

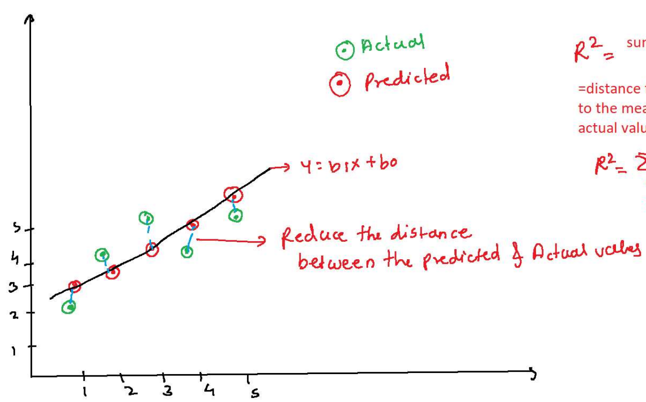
$x=2$
$y = 0.6 \times 2 + 2.2 = 3.4$

$x=3$
$y = 0.6 \times 3 + 2.2 = 4$

$x=4$
$y = 0.6 \times 4 + 2.2 = 4.6$

$x=5$
$y = 0.6 \times 5 + 2.2 = 5.2$

Residual =Actual-Predicted



$R^2 =$ sum of squared residuals

=distance from predicted values to the mean / distance from actual values to mean

$$R^2 = \frac{\Sigma(\hat{y}-\bar{y})^2}{\Sigma(y-\bar{y})^2} = \frac{3.6}{6}$$

$$\boxed{R^2 = 0.6}$$

$R^2 = 0-1$

if the value is close to 1 → model is good