Root Mean Square Error

$\sqrt{\ }$ (Root) — algebra (Mean) — x^2 (Square) — $y-\hat{y}$ (Error)

$$= \sqrt{\frac{\sum (y-\hat{y})^2}{n-2}}$$

(summation)

$-2^2 = -4$

$(-2)^2 = 4$

$2^2 = 4$
$(-2)^2 = 4$ ⟩ always positive

$\sqrt{x} \Rightarrow$ always positive

$\sqrt{x^2}$ = opposite ⇒ cancel each other

$\sqrt{x^2} = |x|$ absolute value ⇒ distance from 0

$$RMSE = \sqrt{\frac{\Sigma (y-\hat{y})^2}{n-2}}$$

Line A

$y-\hat{y}$	$(y-\hat{y})^2$
-6.06	36.72
-0.38	0.14
-27.32	746.38
-14.16	200.50
-4.22	17.80
2.2	4.84
6.1	37.21
1.36	1.84
	$\Sigma(y-\hat{y})^2$ 1045.43

RMSE $= \sqrt{\frac{1045.43}{8-2}}$

$= 13.20$

4 most of the data is within 13.2 of the $\hat{y}$

Line B

$y-\hat{y}$	$(y-\hat{y})^2$
0.57	0.33
-4.574	20.92
-12.57	158
6	36
-3.002	9.012
0.712	0.507
18.142	329.13
5.286	27.942
	Σ = 581.82

RMSE $= \sqrt{\frac{581.82}{8-2}}$

$= 9.84$

average error

Root Mean Square Error $= \sqrt{\frac{\sum (y-\hat{y})^2}{n-2}}$

sigma ⇒ summation

$(y-\hat{y})^2$

Ave

(RMSE)

Absolute value

how far from 0

$(-6)^2 = (-6)(-6) = 36$ $\quad 6^2 = 36$

$-6^2 = -6 \cdot 6 = -36$ $\quad (-6)^2 = 36$ } always pos

|x|

$\sqrt{x}$ ⇒ always pos.

$\sqrt{x^2} = |x|$

$$RMSE = \sqrt{\frac{\Sigma (y-\hat{y})^2}{n-2}}$$

$y-\hat{y}$	$(y-\hat{y})^2$
-6.06	36,72
-0.38	0.14
-27.32	746.38
-14.16	200.51
-4.22	17.81
2.2	4.84
6.1	37.21
1.36	1,85

$\Sigma (y-\hat{y})^2 = 1045,46$

$$RMSE = \sqrt{\frac{1045.46}{8-2}}$$

$$= 13.20$$

most of the Data is within 13.20 units of the prediction.

$$RMSE = \sqrt{\frac{\Sigma(y-\hat{y})^2}{n-2}}$$

Line B

$y-\hat{y}$	$(y-\hat{y})^2$
0.57	0.32
-4.574	20.92
-12.57	158
6	36
-3.002	9.01
0.712	0.51
18.142	329.13
5.284	27.92

581.81 = $\Sigma(y-\hat{y})^2$ = numerator

$$RMSE = \sqrt{\frac{581.81}{8-2}}$$

$$\approx 9.85$$