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Exercise - 1

Given $\hat{y} = [0.5 \quad -4.5 \quad -9.5]^T$

$y = [0 \quad -4 \quad -9]^T$

a) RMSE $= \sqrt{\frac{\sum_{i=1}^{n} (\hat{y}_i - y)^2}{n}}$

$= \sqrt{\frac{[(0.5-0)^2 + (-4.5-(-4))^2 + (-9.5-(-9))^2]}{3}}$

$= \sqrt{\frac{3 \times (0.5)^2}{3}} = 0.5$

b) MAE $= \frac{\sum_{i=1}^{n} |\hat{y}_i - y_i|}{n}$

$= \frac{1}{3}[|0.5-0| + |-4.5-(-4)| + |-9.5-(-9)|]$

$= \frac{3 \times 0.5}{3}$

$= 0.5$

c) $\|y\|_0$ = Total number of non-zero elements

$= \alpha$ i.e, -4.5 and -9.5

d) $\|y\|_1 = |0| + |-4| + |-9|$

$= 13$

e) $\|y\|_2 = \sqrt{0^2 + (-4)^2 + (-9)^2}$

$= \sqrt{97}$

$\simeq 9.85$

f) $\|y\|_\infty$ = Maximum absolute value

$= 9$