

Attendance credit:

- 1 point if you sign in.
- 0.5 extra point if you submit your solutions on Camino by 9 pm and all the answers are correct.
- You may collaborate with other students.

Given:

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

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- Find RMSE and MAE of $(\mathbf{y}, \hat{\mathbf{y}})$
- Find $\|\mathbf{y}\|_0$, $\|\mathbf{y}\|_1$, $\|\mathbf{y}\|_2$ and $\|\mathbf{y}\|_\infty$

- $\text{RMSE} = \sqrt{\frac{1}{3}(\langle 0.5 - 0 \rangle^2 + \langle -4.5 - -4 \rangle^2 + \langle -9.5 - -9 \rangle^2)} = \mathbf{0.5}$
- $\text{MAE} = \frac{1}{3}(|0.5 - 0| + |-4.5 - -4| + |-9.5 - -9|) = \mathbf{0.5}$
- $\|\mathbf{y}\|_0 = \mathbf{2}$ (the total number of non-zero elements)
- $\|\mathbf{y}\|_1 = |0| + |-4| + |-9| = \mathbf{13}$
- $\|\mathbf{y}\|_2 = \sqrt{\langle 0 \rangle^2 + \langle -4 \rangle^2 + \langle -9 \rangle^2} = \sqrt{\mathbf{97}} = \mathbf{9.85}$
- $\|\mathbf{y}\|_\infty = \mathbf{9}$ (the maximum absolute value)