16. (12 points) Equation 2 shows how MSE is calculated in Linear Regression, and Equation 3 shows how MAE is calculated where m is number of samples. Equation 4 shows how each predicted value $\hat{y}^{(i)}$ is calculated.

$$\boldsymbol{MSE(\theta) = \frac{1}{m}\sum_{i=1}^{m}(\theta^T x^{(i)} - y^{(i)})^2} \tag{2}$$

$$\boldsymbol{MAE(\theta) = \frac{1}{m}\sum_{i=1}^{m} \mid \theta^T x^{(i)} - y^{(i)} \mid} \tag{3}$$

$$\hat{y}^{(i)} = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_3 + \theta_4 x_4 \tag{4}$$

A regression model has been trained on a separate training set and the trained model parameters (θ) vector is as follows:

$$\theta = \{\theta_0 = 0, \theta_1 = 2, \theta_2 = 1, \theta_3 = 0.5, \theta_4 = -1\}$$

The regression test dataset for four samples is given in Figure 3. Each sample has values for the four features $\{x_1, x_2, x_3, x_4\}$ as well as the actual target value $y^{(i)}$

id	x_1	x_2	x_3	x_4	y(i)
Sample 1	1	0	0	-3	8
Sample 2	0	0.1	0.2	-1	1.3
Sample 3	-2	0	3	0	-1.5
Sample 4	-1	0.2	1	-0.5	-0.3

Figure 3: Regression Dataset

(part a - 6 points) Compute MSE - show your complete work. (Hint: Compute the predicted value $\hat{y}^{(i)}$ for each sample and then put them in Equation 2)

(part b - 6 points) Compute MAE - show your complete work. (Hint: Compute the predicted value $\hat{y}^{(i)}$ for each sample and then put them in Equation 3)