Problem 4

MAE

The Mean absolute error represents the average of the absolute difference between the actual and predicted values in the dataset. It measures the average of the residuals in the dataset.

$$MAE = \frac{1}{M}\sum_{i=1}^{M}\left|h(x^i) - y^i\right|$$

you can use this when you have very few or no outliers in your data or in a better way when you want to ignore the outliers while fitting your model to your data. also MAE is more useful when the overall impact is proportionate to the actual increase in error. For example- if error values go up to 6 from 3, actual impact on the result is twice. It is more common in financial industry where a loss of 6 would be twice of 3.

MSE

Mean Squared Error represents the average of the squared difference between the original and predicted values in the data set. It measures the variance of the residuals.

$$MSE = \frac{1}{2M}\sum_{i=1}^{M}(h(x^i) - y^i)^2$$

You can use this when you have a large number of outliers in your data and want to accommodate them while fitting your model.

RMSE

Root Mean Squared Error is the square root of Mean Squared error. It measures the standard deviation of residuals.

$$MSE = \sqrt{\frac{1}{M}\sum_{i=1}^{M}(h(x^i) - y^i)^2}$$

RMSE is more useful when the overall impact is disproportionate to the actual increase in error. For example- if error values go up to 6 from 3, actual impact on the result is more than twice. This could be common in clinical trials, as error goes up, overall impact goes up disproportionately.