Department of Electrical and Computer Engineering
University of Massachusetts Lowell
EECE 5440 Computational Data Modeling I

Assignment #2

1. Consider the system

$$t = w_0 + w_1 x_1 + \varepsilon$$

where $w_0 = -0.3$ and $w_1 = 0.5$. The random variable ε is drawn from the normal distribution with mean 0 and variance 0.2^2. The random variable x_1 is uniformly distributed between (-1,1). Generate the observation t for 40 trials.

a. Using the trial values for t find estimates for the mean and variance of t. Compare the approximate to the exact result.

b. Using the observations for the j^{th} trial t_j and input $\underline{x}^{(j)} = [1, x_1^{(j)}]$ for $j = (0, 39)$. Find $\underline{w}$ using the MLE approach .

c. Compare the computed and exact result for $\underline{w} = [w_0, w_1]^T$.