

EE103L  
Introduction to Matlab  
Assignment 1

1. Create the vector  $\mathbf{x} = [1, 2, \dots, 100]$ . Assign the even numbers of  $\mathbf{x}$  to a new vector  $\mathbf{y}$ .
2. Use **for** loop to find the values of  $x(t) = 3 \cos(2\pi f t + 0.1)$  for  $t = 0, 0.1, 0.2, 0.3, 0.4$  s when  $f = 10, 15$ , and  $20$  Hz. Use one set of statements to compute the values for all three frequencies and store the results in a two-dimensional array. Use two nested for loops and double indexing.
3. Use **while** loop to find the largest value of positive  $t$  for which  $e^{1.2} \cos(\omega t)$  and  $t^3$  are both less than  $10$ . Make the computation for  $\omega = 35, 40$ , and  $45$ . Find your answers to the nearest  $0.01$ .
4. Create a  $15$ -element vector with values of  $x(t) = 4 \cos(2\pi t + 0.2) + 3 \sin(\pi^2 t)$  at equally spaced interval  $0 \leq t \leq 1$ . Find the maximum element value, the minimum element value, the average of the element values, and the indices of the elements for which the element magnitude is greater than  $4$ .
5. Assume  $s_1 = \sin(2\pi f_1 t)$ ,  $s_2 = \sin(2\pi f_2 t + 0.4)$  and  $s_3 = s_1 + s_2$ , where  $f_1 = 0.2$  and  $f_2 = 0.425$ . Plot  $s_1$ ,  $s_2$  and  $s_3$  v/s  $t$  with  $t = 0 : 0.1 : 10$  on the same graph (you have to use **hold on** command). Label the axes and create legends for each graph.
6. Sinc function is a function that arises frequently in our course. It is defined as

$$\text{sinc}(x) = \begin{cases} 1 & \text{for } x=0 \\ \sin(x)/x & \text{otherwise} \end{cases}$$

Create a Matlab function **MySinc** ( ) that defines **sinc(x)** function following the above definition. Plot the value **sinc(x)** in the interval  $[-2\pi \ 2\pi]$  using **MySinc** ( ) function and Matlab inbuilt **sinc** ( ) function on the same graph.