

MATLAB for SMS

Summer 2011

Problem Set 1

Use the MATLAB help files to find an appropriate function when asked. Finding an appropriate function and teaching yourself to use the command is part of the exercise.

1. Find a function that will generate a row vector with 1000 elements whose values are randomly chosen from a uniform distribution on the interval (0,1).
 - a. Calculate the median value of your vector.
 - b. Calculate the maximum and minimum values of your vector.
 - c. What is the linear index of the maximum value? It's subscripted index?
 - d. Reshape the vector so that it contains 20 rows. What is the subscripted index of the maximum value after the vector is reshaped?
2. Do the same as problem 1, but choose the 100 numbers randomly from a normal distribution with a mean of 25 and a standard deviation of 5.
 - a. Do the mean and standard deviation of your vector correspond to the values you input?
 - b. Calculate the median value and compare it to the mean.
 - c. Comment on the significance of the difference or equality of the mean and median.
3. Find a function that will generate a regularly spaced vector with 30 elements whose values lie on the interval (0,1000).
4. Find a function that will generate a logarithmically spaced vector with 30 elements whose values lie on the interval (0,1000).
5. Find a function that returns the spacing interval (i.e., the difference between an element and the element immediately preceding it) for each of the vectors generated in exercises 3 and 4. Are the intervals constant in both vectors? (If you know how to use loops already, don't use one. Find the function.)
6. Generate equally sized vectors whose elements contain the cumulative sums (i.e., `sum(1:n)` for index `n`) and cumulative products of the vectors generated in exercises 3 and 4. (see comment following exercise 5)