

Loop Constructs

Though MATLAB has a number of built-in functions that are equivalent to some of the following exercises, use a loop construct to carry out the indicated computations. It will probably be easiest to write a short script since these are inherently multi-line problems.

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1. Given the vector $x = [1 \ 8 \ 3 \ 9 \ 0 \ 1]$, create a short set of commands that will
 - a. Add up the values of the elements (Check with **sum**.)
 - b. Computes the running sum (for element j , the running sum is the sum of the elements from 1 to j , inclusive. Check with **cumsum**.)
 - c. computes the sine of the given x -values (should be a vector)[ans.](#)
2. Create an M -by- N array of random numbers (use **rand**). Move through the array, element by element, and set any value that is less than 0.2 to 0 and any value that is greater than (or equal to) 0.2 to 1.
[ans.](#)
3. Given $x = [4 \ 1 \ 6]$ and $y = [6 \ 2 \ 7]$, compute the following arrays
 - a. $a_{ij} = x_i y_j$
 - b. $b_{ij} = x_i / y_j$
 - c. $c_i = x_i y_i$, then add up the elements of c .
 - d. $d_{ij} = x_i / (2 + x_i + y_j)$
 - e. $e_{ij} =$ reciprocal of the lesser of x_i and y_j[ans.](#)
4. Write a script that will use the random-number generator **rand** to determine the following:
 - a. The number of random numbers it takes to add up to 20 (or more).
 - b. The number of random numbers it takes before a number between 0.8 and 0.85 occurs.
 - c. The number of random numbers it takes before the mean of those numbers is within 0.01 of 0.5 (the mean of this random-number generator).

It will be worthwhile to run your script several times because you are dealing with random numbers. Can you predict any of the results that are described above?

[ans.](#)

5. Write a script that asks for a temperature (in degrees Fahrenheit) and computes the equivalent temperature in degrees Celcius. The script should keep running until no number is provided to convert. [NB. the function **isempty** will be useful here.]

[ans.](#)

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