1. Check and understand the following commands in Octave:
   (a) $[1:4;5:8]$ and $[1:4,5:8]$
   (b) $[10,12;13,14] * \text{eye}(2)$
   (c) $[1,2;3,4].\wedge 3$ and $[1,2;3,4] \wedge 3$
   (d) `disp(ones(3))` and `disp ones(3)`
   (e) x = -3:3, x(0), x(1), x[1] and x[0].
   (f) x(2,:) and x(:,2) if x = `reshape`(1:9, 3:3)
   (g) The operators = and == and =
2. Use `linspace` function to create vectors idential to those obtained with the statements that follow. Use multiple statements where necessary. Write a command that will test if the vector you produced and the vector given below are equal.
   (a) $x = 0:10$
   (b) $x = 0:0.2:10$
   (c) $x = -12:-12$
   (d) $x = 10:-1:1$
3. A matrix can be treated as a collection of row or column vectors. Given the row vectors $u = (1,2,3)$ and $v = (4,5,6)$ write the (single) statement to create the 2×3 matrix A having u as its first row and v as its second row vector.
4. Given the matrix $C = \begin{bmatrix} 11 & 5 \\ 2 & 1 \\ 18 & 7 \end{bmatrix}$, write the two statements to create $s = (11,2,18)^T$ and $t = (5,1,7)^T$, by extracting the columns of C.
5. Let $D = \begin{bmatrix} 2 & -1 & 0 & 0 \\ -1 & 2 & -1 & 0 \\ 0 & -1 & 2 & -1 \\ 0 & 0 & -1 & 2 \end{bmatrix}$, $M = \begin{bmatrix} 2 & 8 & 14 & 20 \\ 4 & 10 & 16 & 22 \\ 6 & 12 & 18 & -24 \end{bmatrix}$, $T = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 \\ -1 & 1 & 0 & 0 & 1 \\ -1 & -1 & 1 & 0 & 1 \\ -1 & -1 & -1 & 1 & 1 \\ -1 & -1 & -1 & -1 & 1 \end{bmatrix}$,
   (a) Use `diag` function to create D
   (b) Write a one-line expression to create T
   (c) Use the `reshape` function and `colon` notation to create M.
6. Plot $\sin\theta$ for 50 poinnts in $[0, 2\pi]$. Connect the points with a dashed line and create a x-axis label θ and y-axis label $\sin(\theta)$

Summary

1. Starting Octave and using it as a calculator.
2. Define variables and perform computations with them.
3. Know how to suppress printout with `;`
4. Recognize built-in variables.
5. Use on-line `help` to get more information on a function.
6. Create matrices and vectors with direct assignment (using `[]`)
7. Extract elements from vectors and matrices with subscript notation.
8. Use colon notation to create vectors.
9. Use colon notation to extract ranges of elements from vectors and matrices.
10. Use `linspace` and `logspace` to create vectors.
11. Use the transpose operator.
12. Understand how to use array operators (`.*`, `./`, `.^`) *and* why they are different from the regular (`*`, `/`, `^`) operators.
13. Create and manipulate complex vectors and matrices.
14. Use path-changing commands to access files in different directories (folders) on your hard disk.
15. Use the `load` command to read data from a file.
16. Use the `plot` function to plot data stored in Octave variables.
17. Edit and run an m-file (both functions and scripts).
18. Identify the key differences between scripts and functions.
19. Create a function with one, two or more input parameters and one, two or more output parameters.
20. Use comment statements to add documentation to scripts and functions.
21. Use `disp` to print a string and a matrix to the command window.
22. Use relational operators (`<`, `<=`, `>`, `>=`, `~=`), and logical operators (`&`, `|`, `~`).
23. Use `if...end`, `if...elseif...end`, and `if...elseif...else...end` constructs.
24. Write a `for` loop to access each element of a vector of arbitrary length. Use a `while` loop to iterate until a convergence tolerance is met.
25. Know the difference between `break` and `return`, and know how and where to use each.
26. Use `disp` to print string messages from within an m-file
27. Use `disp` to print the values in vectors and matrices from within an m-file