



SCS221I - LABORATORY II

Octave Lab Practical Sheet - 02

Instructions

- Do the tasks given in the practical sheet and take screenshots of the outputs
- Create a report using the screenshots.
- Report must be in PDF format.
- Report name should be <Index number>.pdf (Eg: 2000000.pdf)
- Any form of plagiarism or collusion is not allowed
- upload the document to the submission link.

Exercise:

Do/find out the following using the Octave command line:

1. Type `sqrt(98)`, `98^0.5`, `98^1/2` and `98^(1/2)`. Compare the results which you get in each case.
2. Define a variable called 'y'. Check whether the square root of 'y' is an integer.
3. Find out which of the words - if, when, while, how, which, catch, try, until, spmd, spot, partfor, for, global, else, e, pi, `__FINE__`, `__LINE__`, break, broke and function - are keywords in the Octave programming language.
4. Compare and contrast the outputs of the commands 'who' and 'whos' after defining a series of variables.
5. What is the difference when you define variables with single values and variables which contain matrices? Which command would you use to find this out?
6. See what happens in Octave when you divide infinity by a positive real number, by zero, by a negative real number and by an imaginary number.
7. What is the output of dividing infinity by infinity?
8. What is the square of infinity?
9. What is the square root of infinity?

10. What happens when you add infinity to infinity?
11. What happens when you multiply infinity by infinity?
12. What happens when you subtract infinity from infinity?
13. What is the square root of minus infinity?
14. What is the result of infinity to the power infinity?
15. What is infinity/i?
16. What is the usage of the clc command? Type it on the command line and find out.
17. What is the usage of the clear command? Type it on the command line and find out.
18. Do the following in the command line
 - Type format short.
 - Type pi + e.
 - Now type format long.
 - Type pi + e again.
 - Compare the two outputs and note any differences.
19. Create the following matrices.
 - $X = [2,3; 4,1]$
 - $A = [3,4,10; 70,1,30]$
 - $Z = [2,3; 50,49; 0,1]$
 - $Y = [1,0,0; 0,1,0; 0,0,1]$
20. Now transpose each of the above matrices.
21. Flip each of the above matrices in the left-right direction.
22. Flip each of the above matrices in the up-down direction.
23. If $x = 7$ and $y = x^2 - 6x + 5$, find the value of y using the Octave command line.
24. Generate a matrix that starts at 5, ends at 150 and has 11 values.
25. Generate a matrix that starts at 10, ends at 1000 and has 7 values of logarithmic nature.

26. Type `rand(3,4)` at the command line. Now type it again 5 times. Then compare the values generated in each case.
27. Test and see what happens to the above values when you assign them to a variable.
28. Test and see what happens to the value of `x`, when you enter the equation `x = x + 25` consecutively. What is the value of `x` after entering the equation 7 times at the command line?
29. Test and see what happens to the values of `a` and `z`, when you use them consecutively for 14 times, assuming that `a = 2` and `z = 8`. Now change the values of both `a` and `z` and do the same.
30. Invert this matrix - `[2,3; 4,5]`.
31. In the command line, generate an identity matrix called `y`, that is 12 x 12.
32. Find the determinant of the above matrix.
33. Automatically generate a vector `az`, which starts at 2, has a difference of 7 between each two consecutive values, and ends at 98.
34. `[2,3,7; 8,3,4]` is a matrix called `k`. Rotate it by 540 degrees and assign the values to a new matrix called `m`.
35. Reshape the matrix `w = [1, 0, 1; 2, 3, 5]` into a vertical vector.
36. Save the program below in a file called `matAd.m` and find its output.

```
H = [2,3;4,5]
K = [1,0;5,6]
V = H * K
V = [1,1;2,2]
```