UCSC

SCS2211 - LABORATORY II
Octave Lab Practical Sheet - 01

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.**

Check your Operating System type and version.
Go to the website: https://octave.org/download which contains Octave installation files and download the Octave version suitable for your Operating System type and version.
Install Octave on your computer by double-clicking the Octave installation file.

Upon installation of Octave you will notice that Octave installs 2 icons on your desktop.

- One is the CLI (Command Line Interface).
- The other is the GUI (Graphical User interface).

There are 2 methods to run commands on Octave.

- One method is to run commands in an interactive mode.
- The other method is to type commands in a .m file, and to run that file.

Do the following exercises:-

1. Open the Octave CLI and type the following at the prompt and check the result for each.

- 7 + 3
- 89 - 9
- 4 * 7
- 88 / 22
- 3 / 7
- 5 ^ 5

2. Evaluate the following using the Octave CLI
   - 9^2+7^3*(3+8-9/3)*2^3
   - 8^2-7*2*(8+6)/2
   - 2+3-5*6/(7-5)^5
   - 3*9/3-7^4*(7-3)

3. Evaluate the following using the Octave CLI
   - 7-66+4*cos(0)
   - cos(0)*33/3-67+8
   - cos(0) + cos(0) + cos(0)
   - 5600^cos(0)
   - 55 + 7/cos(0)

4. Evaluate the following using the Octave CLI
   - 78/sin(0)
   - 3/sin(0)
   - 5000000/sin(0)
   - 6.789789789/sin(0)

5. What are the outputs of the following commands?
   - w = [5,6,7;8,10,62;23,4,7]
   - z = [9,8;4,5]
   - t = [7,6,5; 4,3,2]

6. What is the output of the following operation? a + b
   - If the values of the Matrices are:-
   - a = [9,3,4; 5,8,7]
   - b = [7,4,3; 8,7,2]

7. What is the output of the following operation? a - b
   - If the values of the Matrices are:-
   - a = [2,3,4; 5,6,7]
   - b = [7,5,3; 8,1,2]

8. What are the outputs of the following?
   - 3i + 7 + 4i + 8
   - 3j +9i + 3j + 7 + 8i

9. What are the outputs of the following?
   - 3i * 5i
   - 7j * 6i
   - 4i * 8j
   - 3 * 7i
   - 71j * 10
   - 3 * 9

10. Evaluate the following
    - log10(10)
    - log10(2)
    - log10(-3)
    - log10(2) * log10(2)

11. What are the outputs of the following?
    - -7/i
    - -8/4i
    - -6j/3i
    - -8/64j

12. Evaluate the following through Octave
    - [2, 4, 5, 7] - [1, 0, 1, 3]
    - [4, 3, 6, 3] + [2, 0, 1, 7]
    - [2, 3, 5] - [0, 0, 1]
    - [4, 3, 2] + [1, 1, 1]

13. Evaluate the following through Octave
    - [2i, 4i, 3] * 6i
    - [3, 9, 8j] / 4j
    - [-4, -5i, -8] / 4i
    - [-9, -6, -3] * 2j

14. What is the difference between log(2) and log10(2)? Find the answer using Octave.

15. Evaluate the following expression in Octave

    (3^2 + 7*5 - 9/3) / (4^2 - 3*(8 - 7/2) + 6)

    Modify the equation to prioritize subtraction over addition.Rewrite it using parentheses to alter the precedence of operations and run it in octave

16. Evaluate the following using Octave:
    ((7^3 - 5^2 * (3 + 2^4)) / (4 + 3^3)) ^ (1/3) + log10(100) * sin(pi/6)

17. Using matrices:
    A = [2, 4, 6; 8, 10, 12; 14, 16, 18];
    B = [1, 3, 5; 7, 9, 11; 13, 15, 17];

    Perform the following:

    1. A+B
    2. A-B
    3. A*B

18. Evaluate the following expressions to determine whether they have errors or not:

    1. log10(–5+3i)\log_{10}(-5 + 3i)log10(−5+3i)
    2. e(4+5i)e^{(4 + 5i)}e(4+5i)
    3. sin(5+2i)\sin(5 + 2i)sin(5+2i)

19. Given matrices:

    A = [2, 4, 6; 8, 10, 12; 14, 16, 18];
    B = [1, 3, 5; 7, 9, 11; 13, 15, 17];

    Compute the element-wise addition, subtraction, and multiplication of A and B.

20. Compute the following:

    diff1 = log10(100) - log(100);
    diff2 = log10(2.71828) - log(2.71828);

21. Evaluate using octave CLI
    - 15 + 25
    - 350 - 125
    - 18 * 12
    - 55 / 8
    - 3 ^ 8

22. Evaluate using octave CLI
    - 12^2 - 8*(15 - 4) + 3^4
    - 5^3 + (25/5) * (9 - 3^2)
    - (7 + 4) * ((3^2 - 5) / 2) + 10

23. Evaluate using octave CLI
    - cos(pi/4)
    - sin(pi/3) + tan(pi/6)
    - 2 * cos(pi/3) - 3 * sin(pi/6)

24. Evaluate using octave CLI
    - Create and display a 2x3 matrix
    - Add two matrices
        - A = [3, 5; 7, 9];
        - B = [1, 2; 4, 8];
    - Subtract matrices:
        - X = [9, 8; 6, 4];
        - Y = [3, 2; 1, 0];
    - Multiply matrix [2, 3; 4, 6] by 5

25. Evaluate
    - [1, 2, 3] .* [4, 5, 6]
    - [12, 24, 36] ./ [3, 6, 9]

- (5 + 3i) + (2 - 4i)
- (9 + 7i) - (3 + 2i)
- (2 + 3i) * (4 - 5i)
- log10(100)
- log(exp(1))
- log(20) * log10(10)
- [10, 20, 30] + [5, 15, 25]
- [50, 60, 70] - [10, 20, 30]
- 4 * [1, 2, 3]
- Multiply complex vector [2i, 3i, 4] by 2
- Divide complex vector [6i, 9i, 12] by 3
- Add real vector [1, 2, 3] and complex vector [2i, 3i, 4i]