

Practical work 1

Introduction to MATLAB

Purpose of Practical work

The goal of this lab session is to familiarize you with MATLAB software and programming within this environment. The aim is to provide an introduction to the fundamentals of utilizing this tool effectively.

Work to do:

Exercise 01: Basic Commands

1. You can perform basic operations directly in the interpreter by typing them and then pressing the 'Enter' key. Let's try some operations to demonstrate this functionality.	» » »
2. A variable allows us to store a result and reuse it for automating tasks. To assign a value to a variable, we use the '=' sign. Let's initialize two variables, <i>Var1</i> and <i>Var2</i>, with specific values, add these variables together, and assign the result to a variable named SOM.	»
3. What function does the semicolon serve when placed at the end of a command line?	
4. What observations can you make regarding the handling of uppercase and lowercase letters in variable names?	
5. To remove a variable, you can utilize the clear command followed by the variable's name. If no specific variable is specified after clear, it will clear all variables from the workspace. Let's try clearing the variable SOM individually.	»
6. How do you calculate the absolute value of a real?	»
7. Calculate: <ul style="list-style-type: none"> • $\sqrt{2}$ • $\ln(2)$ • $\log_{10}100$ • $\cos\left(\frac{\pi}{3}\right)$ Toolbox: pi, exp, sqrt, log, cos and abs	» » » »
8. If you recall the name of a function but not how to use it, the help command will be useful to you. Take a look at the documentation of some commonly used functions.	»
9. What are the values of <i>i</i> and <i>j</i> in MATLAB? How does MATLAB define complex numbers? How do you declare a complex variable in algebraic notation (e.g., $Z1 = 2 + 3i$) and in trigonometric notation (e.g., $Z2 = \cos\frac{\pi}{4} + i \sin\frac{\pi}{4}$)?	»
10. How do you obtain the conjugate, module, real part, imaginary part, and argument of a complex number? Test these operations on Z1 and Z2. Toolbox: real, imag, abs, angle and conj	»

Exercise 02: Scripts

To enable the reuse of calculation lines, it's beneficial to organize them into a script. A script is a text file that MATLAB can read and execute.

Question 01: Open the MATLAB Script Editor by clicking on the blank toolbar page or navigating to the "File -> New -> Script" menu. Create the following script:

Save the file as 'Lab1_Q1.m' and then run it in the MATLAB interpreter.

```
% This is a matlab script ,
% The "%" sign allows you to put comments that will not be interpreted

disp('Premier Script MATLAB')
% disp allows you to display what you want on the screen

a = input('enter a:')
b=6
b=b+a
a, b % The comma allows multiple commands to be placed on a single line in MATLAB. It serves
the same purpose as pressing the Enter key.
```

Question 02 :

Write a program named *Lab_Q2.m* to store the following instructions:

1. Generate two variables X and Y randomly using the **rand** command.
2. Define a variable S to store the sum of X and Y.
3. Calculate the square root of S and store it in a variable R (Use the **sqrt** command).
4. Display the values of S and R using the **disp** command.
5. Calculate the power of 2 of X and the power of 5 of Y, storing the results in variables P and T respectively.

```
% This is the MATLAB code for Lab 1 Exercise 1.
```