

LABORATORY REPORT

**Lab 1**



**Logo

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# **1. Introduction**

# **2. Getting Started**

# **3. MATLAB Commands**

1. Typing help gives you a list of all help topics. Typing help gives help on a specic MATLAB function.

**MATLAB Tips 1:** More useful commands

• whos lists all variables

• clear clears all variables

1. Perform the following operations in MATLAB:

(a) Generate the following column vectors as MATLAB variables:

Graphical user interface, Word

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(b) Using the computer, issue the following MATLAB commands

Shape

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* “.\*” is for multiplying one element with another element in the same position.
* “\*” is for multiplying the 2 matrices by matrix operation.

(c) Convince yourself that the answer makes sense by checking the matrix dimension and computing each result by hand.

**3. MATLAB Tips 2: Plot and Subplot**

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Chart, line chart

Description automatically generated

Text

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Chart, line chart

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**4. Complex Numbers:**

a. MATLAB recognizes i as an imaginary number. Try entering sqrt(-1) into MATLAB, does the result make sense?

Shape

Description automatically generated with medium confidence

The result means that Matlab can process complex numbers and the sqrt(-1) is equivalent to i.

b. MATLAB uses the letter i instead of j by default. Electrical Engineers prefer using j however, and MATLAB will recognize that as well. Try entering i+j, does this make sense.

Shape

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The result leads to the conclusion that the i and j are same.

c. Define . Find the magnitude, phase, real and imaginary parts of (using abs(), angle(), real(), imag(), respectively). Is the phase in radians or degrees?

Graphical user interface, text, application

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angle(), real(), imag(), respectively): The phase is in radians

d. Find the magnitude of Where

Graphical user interface, text, application

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e. The value of . The result is:

Shape

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**5. Complex Functions:**

Text, letter

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Chart, line chart

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6. Playing and Plotting a Sound Load the built-in data named "handel" and play it:

Graphical user interface, text

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# **4. Script Files**

**Exercise 1:**

1. Enter the name to the script where indicated:

**A screenshot of a computer

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1. Edit the script to create a second signal:

Text, letter

Description automatically generated

1. Display both signals in the same windows, the first signal is on the top and the second one is on the bottom:

Chart

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1. The period of the cosine is 1s (for the first signal) and 2s (for the second signal).

Exercise 2:

-Run the file compexp.ms

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Graphical user interface, diagram

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* To make the oscillation frequency lower by half, we change the equation from (2\*pi) to (pi), we get the equation: y=3\*exp(-(0.25+j\*(pi))\*t);

Text

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This is the result that the oscillation frequency is lower by half:

Diagram, engineering drawing

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\_ To make the decay faster, we increase the value of (0.25 + j\*pi). For example, in this case, we use the number 5 instead of 0.25, the equation becomes:

y=3\*exp(-(0.25\*0.5+j\*(2\*pi))\*t);

Text

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