

LAB PRACTICE # 1

Introduction to the MATLAB

Subject: - Feedback Control Systems

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Entering and Quitting MATLAB

- ☞ To enter MATLAB double click on the MATLAB icon.
- ☞ To Leave MATLAB Simply type **quit** and press **enter**.

Creating & Manipulating Matrices & Vectors

To create a vector **v** simply type in:

```
v = [2 4 7 5]
```

After pressing “return” the value of **v** will have been echoed back to you.

To suppress echo use semicolon after the command

```
w = [1 3 8 9];
```

Operation on Matrices

Exercise#1: Investigate the effect of the following commands:

(a) `v(2)`

(b) `sum = v + w`

(c) `diff = v - w`

(d) `vw = [v w]`

(e) `vw(2: 6)`

(f) `v'`

Creating a Column Vector

To create

$$z = \begin{bmatrix} 1 \\ 1 \\ 0 \\ 0 \end{bmatrix}$$

you can type

`z = [1; 1; 0; 0];` or

**`z = [1
1
0
0];`**

Exercise#2: Investigate the effect of the following commands

(a) z'

(b) $z*v$

(c) $[v; w]$

(d) $v*z$

(e) $[z; v']$

(f) $z + v'$

To enter the matrix

$$M = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

The most obvious ways are to type

$M = [1 \ 2; 3 \ 4];$ or

$M = [1 \ 2$
 $3 \ 4];$

Exercise#3: Investigate the effect of the following commands:

(a) $N = \text{inv}(M)$

(b) $M * N$

(c) $I = \text{eye}(2)$

(d) $M + I$

(e) $M * z(1:2)$

(f) $v(3:4) * M$

(g) $M(1,1)$

(h) $M(1:2,1:2)$

(i) $M(:,1)$

(j) $M(2,:)$

Exercise#4: Use the help command to find out about the following built-in functions and make up your own simple examples:

1. ones

2. zeros

3. det

4. Linspace

5. Logspace

Graphs

We will plot the graph of $y = \sin(t)$ for t going from 0 to 20 seconds Type:

```
t=linspace(0,20,100);  
y = sin(t);  
Plot(t,y)  
xlabel('Time in seconds')  
ylabel('sin(t)')  
title('your Roll No.')  
grid
```

Exercise#5:

1. Generate a vector **yc** containing the values of **cos(t)** for the same time range **0 to 20**.
2. From the “help” entry for “plot” find out how to get both **ys** and **yc** plotted against **t** on the same axis.
3. From the “help” entry for “subplot” find out how to plot **ys** and **yc** plotted on two separate graphs, one above the other.