The purpose of this document is to provide you with some basic commands on how to build arrays, do simple manipulations on them and create 2D plots in MATLAB.

1. Construct the row vector $a = \{3 \quad 1 \quad 5 \quad 7 \quad 9 \quad 2 \quad 6\}$:

```
a = [3 1 5 7 9 2 6]     %this sign tells MATLAB to ignore rest of this line
```

2. Extract the 4th element of a:

```
a(4)            % takes the 4th element of a and assigns the result to the
                % array ans.
c = a(4)        % takes the 4th element of a and assigns the result to the
                % array named c
```

3. Change the 4th element of a to 8:

```
 a(4)=8
```

4. Delete the 5th element of a:

```
a(5)=[]    %[] is the empty matrix whose size is 0x0
```

5. Construct the column vector $b = \begin{Bmatrix} 2 \\ 5 \\ 7 \end{Bmatrix}$:

```
b = [2; 5; 7]
% or
b = [2 5 7]'    %(Note: ' is the transpose operator!)
```

6. Construct the matrices $A = \begin{bmatrix} 2 & 4 & 1 \\ 6 & 7 & 2 \\ 3 & 5 & 9 \end{bmatrix}$:

```
 A = [2 4 1; 6 7 2; 3 5 9]
```

7. Extract the element a_{32} from matrix A:

```
 A(3,2)
```

8. Extract the following submatrix from A:

```
 A(1:2,2:3)
```

9. Extract the second row of A:

```
A(2,:)          % ":" means all elements of the array
```

10. Append b to the right of A:

```
[A b]    %the sizes of the two arrays must be compatible
```

11. Delete the last column of A:

```
A(:,3) = []
```

12. Construct the symmetric matrix $B = \begin{bmatrix} 1 & 5 & 6 \\ 5 & 2 & 4 \\ 6 & 4 & 1 \end{bmatrix}$

```
B = [1 5 6; 5 2 4; 6 4 1]
```

13. Compute A+B, A-B, A*B:

```
A+B    %(A and B should be of the same size)
A-B    %(A and B should be of the same size)
A*B    %(the no. of columns of A should be equal to the no. of rows of B)
```

14. Obtain the element-wise multiplication of A and B matrices:

```
A.*B    % A and B should have the same size
```

15. Compute the solution of the system of linear equations Ax=b (i.e., solve for x):

```
x = inv(A)*b
%or
x = A\b  %backslash operator \ is used to solve linear systems of equations
```

16. Construct an array of integers from 0 to 100 (inclusive):

```
r = 0:100; % a ";" at the end of the line prevents the output
           % to be printed on the command window.
```

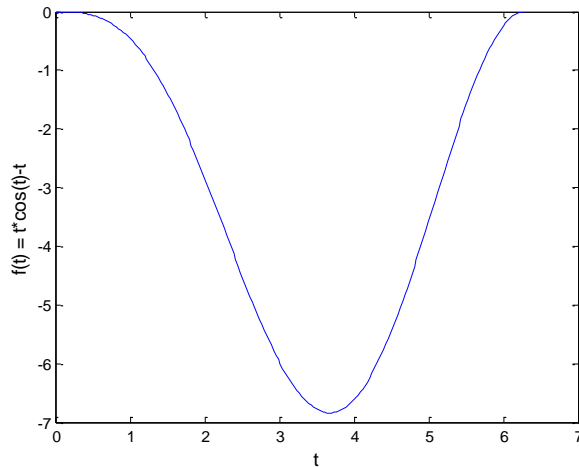**17.** Construct an array of even numbers from 0 to 100 (inclusive):

```
s= 0:2:100;%format is first:step:last. I step is omitted, it
           %is equal to 1 by default.
```

18. Construct an array that is bounded by [0 2π] and has elements that are spaced with $\pi/100$ increments:

```
t = 0:pi/100:2*pi;
```

19. Plot t versus f(t) = t*cos(t)-t:

```
f = t.*cos(t)-t;
plot(t,f)
xlabel('t')
ylabel('f(t) = t*cos(t)-t')
```


20. The MATLAB command to get help about a command:

```
%"help" followed by the command
help plot
```