MATLAB Practical File

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B.Tech CSE

Contents

1 Using MATLAB, find the largest number among three numbers

```
a=input('First Number:');
b=input('Second Number:');
c=input('Third Number:');
if (a>b && a>c)
  great=a;
elseif (b>a && b>c)
  great=b;
elseif (c>a && c>b)
  great=c;
end
fprintf('%d is the largest',great)
```

```
First Number:3
Second Number:4
Third Number:5
5 is the largest
```

Listing 1: Output

2 Check if a number is Odd or Even using MATLAB

```
x=input('Enter Number:');
r=mod(x,2);
if r==0
  disp('Number is Even')
else
  disp('Number is Odd')
end
```

```
Enter Number: 3
Number is Odd

Enter Number: 2
Number is Even
```

Listing 2: Output

3 Check if a number is positive or negative using MATLAB

```
a=input('Enter number to check:');
if(a==0)
  disp('A is zero')
elseif(a<0)
  disp('A is negative')
elseif(a>0)
  disp('A is positive')
else
  print('Invalid')
end
```

```
Enter number to check: 3
A is positive

Enter number to check: -3
A is negative

Enter number to check: 0
A is zero
```

Listing 3: Output

4 Print the Factorial of a number

```
x=input('Enter Number:');
y=factorial(x);
fprintf('Factorial of %d is %d', x, y)
```

```
Enter Number:Factorial of 5 is 120

Enter Number:Factorial of 4 is 24
```

Listing 4: Output

5 Print the multiplication table of a number

```
number=input('Enter a number:');
fprintf('Multiplication table of %d:\n', number)
for i = 1:10
  result=number*i;
  fprintf('%d x %d = %d\n', number, i, result)
end
```

```
Enter a number:Multiplication table of 9:
9 x 1 = 9
9 x 2 = 18
9 x 3 = 27
9 x 4 = 36
9 x 5 = 45
9 x 6 = 54
9 x 7 = 63
9 x 8 = 72
9 x 9 = 81
9 x 10 = 90
```

Listing 5: Output

6 Display the elements of a matrix one by one using MATLAB

```
matrix=[1,2,3;4,5,6;7,8,9];
disp('The Matrix is:');
disp(matrix(:));
```

```
The Matrix is:
    1
    4
    7
    2
    5
    8
    3
    6
    9
```

Listing 6: Output

7 Print the Fibonacci series of a number

```
n=input('Enter a number:');
fib[0,1];
while true
  fib_next = fib(end) + fib(end-1);
  if fib_next > n
      break;
  end
  fib=[fib, fib_next];
end
fprintf('Fibonacci series up to %d: ', n);
fprintf('%d', fib);
fprintf('\n');
```

```
Enter a number: Fibonacci series up to 4: 0 1 1 2 3

Enter a number: Fibonacci series up to 10: 0 1 1 2 3 5 8
```

Listing 7: Output

8 Write a program to show multiple matrix operations

```
a=[1,2,3;4,5,6;7,8,9];
b=[9,8,7;6,5,4;3,2,1];

%Addition
c=a+b;
disp('Addition: ')
disp(c);

%Subtraction
d=a-b;
disp('Subtraction: ')
disp(d);

%Multiplication
e=a*b;
disp('Multiplication:')
disp(e);

%Multplying every element
f=a.*b;
disp('Multplying every element:')
disp(f);

%Transpose
g=a';
disp('Transpose: ')
disp(g);
```

```
%Dividing every element
h=a./b;
disp('Dividing every element: ')
disp(h);

%Squaring the Matrix
i=a^2;
disp('Squaring the matrix: ')
disp(i);

%Squaring every element
j=a.^b;
disp('Squaring every element: ')
disp(j);

%Matrix Concatination Horizontal
k=[a b];
disp('Matrix Concatination Horizontal: ')
disp(k);

%Matrix Concatination Vertical
l=a;b;
disp('Matrix Concatination Vertical: ')
disp(l);
```

```
Addition:
   10   10   10
   10   10   10
   10   10   10

Subtraction:
  -8  -6  -4
  -2   0   2
   4   6   8

Multiplication:
    30    24    18
    84    69    54
   138   114    90
```

```
Multplying every element:
    9    16    21
   24    25    24
   21    16     9

Transpose:
    1    4    7
    2    5    8
    3    6    9

Dividing every element:
    0.1111    0.2500    0.4286
    0.6667    1.0000    1.5000
    2.3333    4.0000    9.0000

Squaring the matrix:
    30     36     42
    66     81     96
   102    126    150

Squaring every element:
       1     256    2187
    4096    3125    1296
     343      64       9

Matrix Concatination Horizontal:
    1    2    3    9    8    7
    4    5    6    6    5    4
    7    8    9    3    2    1

Matrix Concatination Vertical:
    1    2    3
    4    5    6
    7    8    9
```
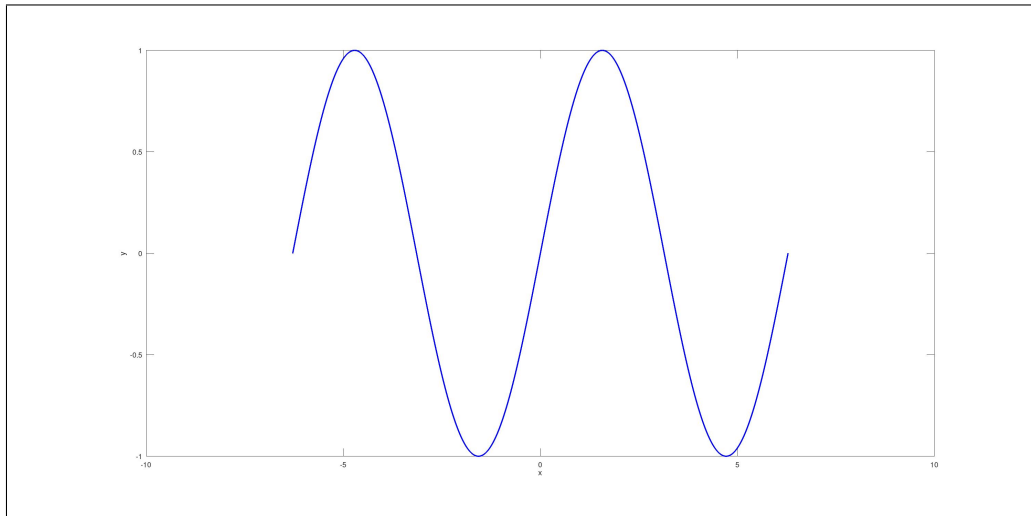
Listing 8: Output

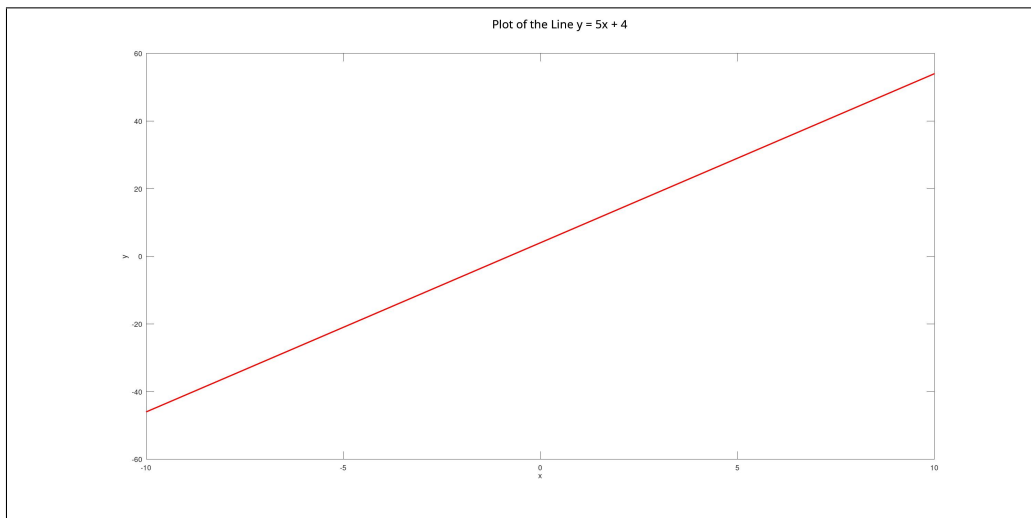# 9 Write a program to plot Sin(x) on a graph

```
x = linspace(-2*pi, 2*pi, 1000);

y = sin(x);

plot(x, y, 'b', 'LineWidth', 2);

xlabel('x');
ylabel('y');
title=('sine graph');
```


Listing 9: Output

10 Write a program to plot the graph of a line

```
x = linspace(-10, 10, 100);

y = 5 * x + 4;

plot(x, y, 'r', 'LineWidth', 2);

xlabel('x');
ylabel('y');
title('Plot of the Line y = 5x + 4');
```


Listing 10: Output

11 Write a program to show the use of linespace

```
vector1 = linspace(0, 10, 5);
vector2 = linspace(-5, 5, 10);
disp('5 values between 0 and 10:');

disp('Vector 1 is:');
disp(vector1);
disp('Vector 2 is:')
disp(vector2);
```

```
5 values between 0 and 10:
Vector 1 is:
        0    2.5000    5.0000    7.5000   10.0000
Vector 2 is:
  -5.0000   -3.8889   -2.7778   -1.6667   -0.5556    0.5556
       1.6667    2.7778    3.8889    5.0000
```

Listing 11: Output

12 Write a program to grade eval based on Marks input.

```
marks = input('Enter the marks (0-100): ');
if marks >= 90
  grade = 'A+';
elseif marks >= 80
  grade = 'A';
elseif marks >= 70
  grade = 'B+';
elseif marks >= 60
  grade = 'B';
elseif marks >= 50
  grade = 'C';
elseif marks >= 40
  grade = 'D';
else
  grade = 'F';
end

fprintf('The grade of %d marks is %s\n',marks, grade);
```

```
Enter the marks (0-100): 95
The grade of 95 marks is A+

Enter the marks (0-100): 33
The grade of 33 marks is F

Enter the marks (0-100): 85
The grade of 85 marks is A
```

Listing 12: Output

13 To check whether a year is leap year or not

```
year = input('Enter a year: ');

if mod(year, 4) == 0 && (mod(year, 100) == 0 ||
    mod(year, 400) == 0)
  disp('Leap Year');
else
  disp('Not a leap year');
end
```

```
Enter a year: 2000
Leap Year

Enter a year: 1995
Not a Leap Year
```

Listing 13: Output