

OUTPUT

Enter the first number : 5
Enter the second number : 7
The result is 468

(9)

Input two numbers from the keyboard and find the summation of cubic form of both number if the first number is less than second number otherwise find the summation of square form of both numbers.

clc;

```
n1 = input ('Enter the first number :');  
n2 = input ('Enter the second number :');  
if n1 < n2
```

```
res = n1 ^ 3 + n2 ^ 3;
```

```
fprintf ('The result is %d', res);
```

```
else
```

```
res = n1 ^ 2 + n2 ^ 2;
```

```
fprintf ('The result is %d', res);
```

```
end
```

OUTPUT

Enter the age : 16
You are underage!

- Q) Write a MATLAB program to input the age of a person and check whether the person is eligible to cast his vote. (The age of the person must be greater than or equal to 18)

```
clc;
n1 = input ('Enter the age :');
if n1 >= 18
    fprintf ('You can vote !');
else
    fprintf ('You are underage !');
end
```

OUTPUT

Enter first number : 2

Enter second number : 6

Enter third number : 4

6 is greatest 2 is smallest

- Q) Write a MATLAB program to find the greatest and smallest number among three numbers which are taken as input from the keyboard.

clc;

a = input ('Enter first number :');

b = input ('Enter second number :');

c = input ('Enter third number :');

if ($a > b$) & ($a > c$)

 fprintf ('%d is greatest', a);

elseif ($b > a$) & ($b > c$)

 fprintf ('%d is greatest', b);

else

 fprintf ('%d is greatest', c);

end

if ($a < b$) & ($a < c$)

 fprintf ('%d is smallest', a);

elseif ($b < a$) & ($b < c$)

 fprintf ('%d is smallest', b);

else

 fprintf ('%d is smallest', c);

end.

OUTPUT

Enter the values in terms of the format $ax^2 + bx + c$

Enter the value of a: 2

Enter the value of b: 3

Enter the value of c: 5

Roots = -3.00, -3.00

- Q) Write a MATLAB program to find roots of a quadratic equation. ($x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$)

```
clc;
fprintf ('Enter the values in terms of the format ax^2+bx+c');
a = input ('Enter the value of a : ');
b = input ('Enter the value of b : ');
c = input ('Enter the value of c : ');
D = sqrt (b^2 - 4*a*c);
root1 = (-b+D)/2^a;
root2 = (-b-D)/2^a;
if D<0
    fprintf ('Imaginary roots');
else
    fprintf ('Roots = %.2f, %.2f ', root1, root2);
end
```

OUTPUT

10
20
30
40
50

9

Write a MATLAB program to display all the natural numbers between 1 & 50 which are divisible by 5 & 10.

```
clc;  
n = 1;  
while n <= 50  
    if mod(n, 5) == 0 & mod(n, 10) == 0  
        fprintf('n is %d\n', n);  
    end  
    n = n + 1;  
end
```

OUTPUT

Enter the number: 4321

No. of digits = 4

(Q) Input a positive number from the keyboard & count the no. of digits present in the number. (The number should be greater than 9).

clc;

n = input ('Enter the number:');

d=0;

while n >= 1

n = n/10;

d = d + 1;

end

fprintf (' No. of digits = %d', d);

OUTPUT

Sum = 15

Q)

Write a MATLAB program to create a row vector and find the sum of all elements of the vector.

```
clc;
x = [2 7 6];
sum = 0;
i = 1;
while i <= length(x)
    sum = sum + x(i);
    i = i+1;
end
fprintf ('Sum = %d', sum);
```

OUTPUT

Enter a positive number : 123321
Is a palindrome

- Q) Write a MATLAB program to input a positive number and check whether it is palindrome number or not.

```
clc;
a = input ('Enter a positive number :');
num = a;
sum = 0;
while a > 0
    rem = mod (a,10);
    sum = (sum * 10) + rem;
    a = floor (a/10);
end
if sum == num
    fprintf ('Is a palindrome');
else
    fprintf ('Is not a palindrome');
end
```

OUTPUT

Enter the lower limit : 1

Enter the higher limit : 50

1

2

3

5

7

11

13

17

19

23

29

31

37

41

43

47

Q)

Write a MATLAB program to display all prime numbers between two limits which are inserted by the user.

clc;

low = input ('Enter the lower limit :');

high = input ('Enter the higher limit :');

for i = low:1: high

flag = true;

for j = 2:1: floor(i/2)

if mod(i, j) == 0

flag = false;

break;

end

end

if flag

fprintf ('%d \n', i);

end

end

OUTPUT

Column Vector =

2

3

4

6

Transpose Vector =

2 3 4 6

Sum = 30

Q) Write a MATLAB program to create a column vector, transpose it and finally find the summation of column vector and the transpose form.

clc;

X = [2; 3; 4; 6];

fprintf ('Column Vector = \n');

disp(X);

Y = X';

fprintf ('Transpose Vector = \n');

disp(Y);

n = length(X);

sum = 0;

for i=1:1:n

sum = X(i) + sum;

end

sum_t = 0;

for i=1:1:n

sum_t = Y(i) + sum_t;

end

fprintf ('Sum = %d ', sum + sum_t);

OUTPUT

A = 1 1 0 0

B = 1

2

3

4

C = 3

D = 1 1 0 0

2 2 0 0

3 3 0 0

4 4 0 0

8)

Create a 1×4 row vector A and a 4×1 column vector B, $A = [1 \ 1 \ 0 \ 0]$, $B = [1; 2; 3; 4]$ multiply A times B and multiply B times A.

clc;

A = [1 1 0 0]

B = [1; 2; 3; 4]

C = mtimes (A, B)

D = mtimes (B, A)

OUTPUT

A =

$$\begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 7 \end{bmatrix}$$

B =

$$\begin{bmatrix} -5 & 8 & 11 \\ 3 & 9 & 21 \\ 4 & 0 & 8 \end{bmatrix}$$

Product of A and B

P =

$$\begin{bmatrix} 24 & 35 & 114 \\ 30 & 52 & 162 \end{bmatrix}$$

Inner Product of second row of A and third column of B :

162

Expt No

12

Page No 12

Date _____

8)

Create two matrices A and B , $A = [1 \ 3 \ 5 ; 2 \ 4 \ 7]$ and $B = [-5 \ 8 \ 11 ; 3 \ 9 \ 21 ; 4 \ 0 \ 8]$. Calculate the product of $A \times B$. Calculate the inner product of second row of A and the third column of B.

$$A = [1 \ 3 \ 5 ; 2 \ 4 \ 7 ;]$$

$$B = [-5 \ 8 \ 11 ; 3 \ 9 \ 21 ; 4 \ 0 \ 8 ;]$$

fprintf ('Product of A and B');

P = mtimes (A, B)

fprintf ('Inner Product of second row of A and third column
of B : \n');

$$\text{inner_product} = A(2,1) * B(1,3) + A(2,2) * B(2,3) + \\ A(2,3) * B(3,3);$$

disp (inner_product);

OUTPUT

>> [fact] = factorial(5)

fact =

120

Q)

Find the factorial of a number by writing a function.

function [fact] = factorial(a)

i = 1;

fact = 1;

while i <= a

fact = fact * i;

i = i + 1;

end

end

OUTPUT

» [root 1, root 2] = quad-equa(1, 4, 4)

root 1 =

-2

root 2 =

-2

Expt. No.

14

Page No. 14

Date _____

Q) Find the roots of a quadratic equation by writing a function.

function [root 1, root 2] = quad-equa(a, b, c)

D = b^2 - 4*a*c;

Disc = sqrt(D);

root1 = (-b + Disc) / 2*a;

root2 = (-b - Disc) / 2*a;

end

OUTPUT

```
function [count] = Prime (2, 20)
count =
    7
```

Expt. No.

15

Page No 15
Date 18/02/25

Q)

Write a MATLAB function to take two arguments specifying lower limit and upper limit and return the number of prime numbers between two limits.

```
function [count] = Prime (lower_limit, upper_limit)
```

```
count = 0;
for i = lower_limit + 1 : 1 : upper_limit
    flag = false;
    for j = 2 : 1 : floor(i/2)
        if mod(i, j) == 0
            flag = true;
            break;
        end
    end
    if flag == false
        count = count + 1;
    end
end
```

OUTPUT

$\Rightarrow [\text{evenum}, \text{oddsum}] = \text{odd_even}(1, 100)$

$\text{evenum} =$

2550

$\text{oddsum} =$

2500

- Q) Define a function to find the sum of all even numbers and the sum of all odd numbers between 1 and 100 and return two results.

function [evenum, oddsum] = odd_even(a, b)

evenum = 0;

oddsum = 0;

for i = a:i:b

if mod(i, 2) == 0

evenum = evenum + i;

else

oddsum = oddsum + i;

end

end

end

OUTPUT

```
>> [count] = Palindrome(1,100)  
count =  
9
```

Q) Write a MATLAB function to take 2 inputs specify lower limit & upper limit and return the total no. of palindromes number between these 2 limits.

function [count] = Palindrome (lower_limit,upper_limit)

```
count = 0;  
for i = lower_limit : 1: upper_limit  
    num = i;  
    sum = 0;  
    while i > 0  
        rem = mod(i, 10);  
        sum = sum * 10 + rem;  
        i = floor(i/10);  
    end  
    if num == sum  
        count = count + 1;  
    end  
end
```

OUTPUT

» [sum, sub, mul] = Matrices ([1 2; 3 4], [1 2; 3 4])

sum =

$$\begin{matrix} 2 & 4 \\ 6 & 8 \end{matrix}$$

sub =

$$\begin{matrix} 0 & 0 \\ 0 & 0 \end{matrix}$$

mul =

$$\begin{matrix} 7 & 10 \\ 15 & 22 \end{matrix}$$

Q) Write a MATLAB function to take matrices and find the summation, subtraction and multiplication of these 2 matrices and return the result.

function [sum, sub, mul] = Matrices (a, b)

sum = plus (a, b);
sub = minus (a, b);
mul = mtimes (a, b);

end

OUTPUT $P =$

5 -9 7

 $v1 =$

3

 $v2 =$

15.7500

- (8) Evaluate the value of the polynomial given below at

$x = 1, -2.5$

$y = 5x^2 - 9x + 7$

$P = [5 \quad -9 \quad 7]$

$v1 = \text{polyval}(P, 1)$

$v2 = \text{polyval}(P, 2.5)$

OUTPUT

$P = [1 \ 3 \ 2]$

$\mu = [-2, -1]$

Expt. No.

20

Page No. 20
Date 04/03/25

Q) Find the roots of polynomial $x^2 + 3x + 2$

$$P = [1 \ 3 \ 2]$$

$$\mu = \text{roots}(P)$$

OUTPUT $\mu =$ $-1 \quad -2$ $p =$ $1 \quad 3 \quad 2$

Expt.No.

21

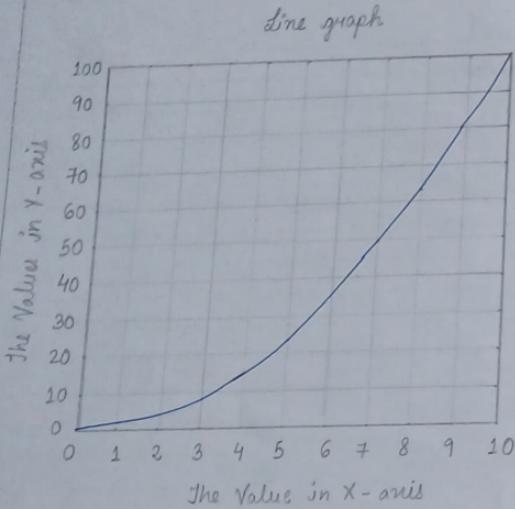
Page No.	21
Date	05/03/25

Q) Determine the polynomial with roots = -1, -2.

$$\mu = [-1, -2]$$

$$p = \text{poly}(\mu)$$

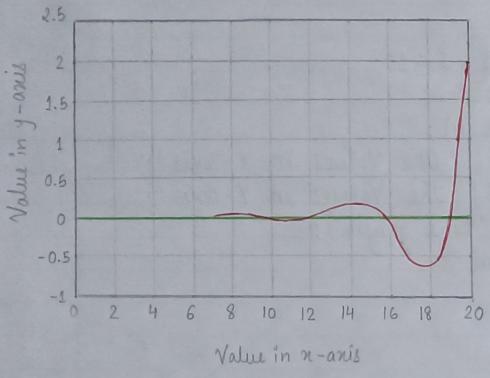
OUTPUT



- Q) Plot the curve given by the equation $y = x^2$, where x varies from 0 to 10.

```
clc;  
x = 0 : 1 : 10;  
y = x.^2;  
plot(x,y);  
xlabel('The Values in X-axis');  
ylabel('The Values in Y-axis');  
title('Line graph')  
grid on
```

OUTPUT



Expt No.

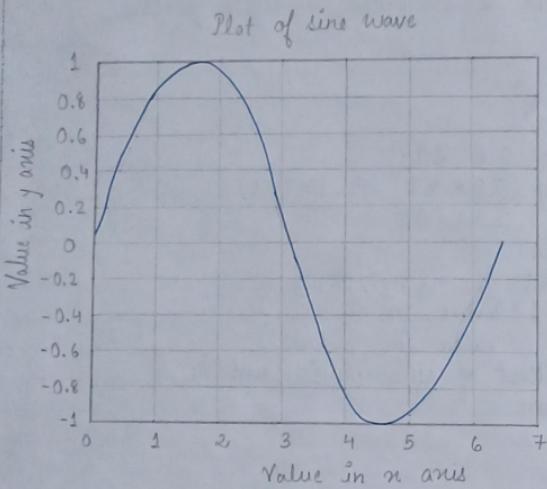
23

Page No 23
Date 08/03/25

Q)

Write a program to illustrate the use of plot command to generate multiple plots.

```
clc;
x1 = 0 : 0.5 : 20;
y1 = exp(0.5 * x1) .* sin(x1);
x2 = 0 : 0.5 : 20;
y2 = sin(x2);
plot(x1,y1,'r',x2,y2,'g');
nlabel('Value in x axis');
ylabel('Value in y axis');
title('Plot of exp and sin wave');
grid on
```

OUTPUT

Expt.No.

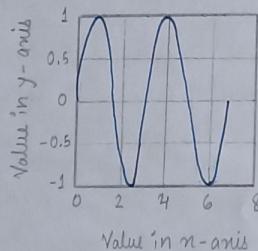
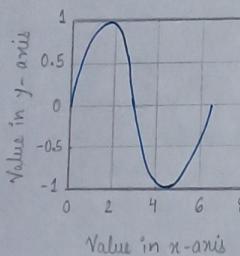
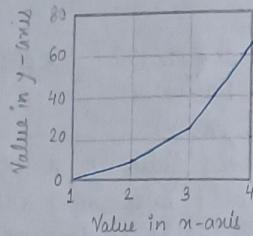
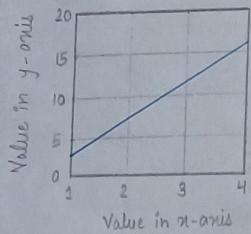
24

Page No. 24
Date 11/03/25

- Q) Plot the curve given by equation $y = \sin x$ as x varies from 0 to 2π .

clc;

 $n = 0 : \pi / 100 : 2 * \pi ;$ $y = \sin(n);$ $plot(n, y);$ $xlabel('Value in x axis');$ $ylabel('Value in y axis');$ $title('Plot of Sine wave');$ $grid on$

OUTPUT

Expt No.

25

- Q) Write a program to plot the four plots in one figure window by dividing the window into four subplots using the subplot command.

```
clc;
I = 1:4;
V = 4 * I;
subplot(2,2,1);
plot(I,V);
nlabel('Value in x-axis');
ylabel('Value in y-axis');
grid on
x = [1 2 3 4];
y = [1 8 27 64];
subplot(2,2,2);
plot(x,y);
nlabel('Value in x-axis');
ylabel('Value in y-axis');
grid on
A = 0 : pi/100 : 2*pi;
B = sin(A);
subplot(2,2,3);
plot(A,B);
nlabel('Value in x-axis');
ylabel('Value in y-axis');
grid on
```

```
C = 0:pi/100:2*pi;  
D = sin(2*C);  
subplot(2,2,4);  
plot(C,D);  
 xlabel('Value in x-axis');  
 ylabel('Value in y-axis');  
 grid on
```

OUTPUT

>armstrong_num(1, 1000)

Armstrong numbers between 1 and 1000 are :

1
153
370
371
407

Expl No

26

Page No 27

Date 12/03/25

Q) Write a MATLAB program to print all armstrong number between a range (lower value and upper value) passed as arguments through a function

function [] = armstrong_num(lower_limit, upper_limit)

sprintf ('Armstrong numbers between %d and %d are:',
lower_limit, upper_limit);

for i = lower_limit : 1 : upper_limit
num = i;

sum = 0;

while num > 0

rem = mod (num, 10);

sum = sum + rem^3;

num = floor (num/10);

end

if sum == i

fprintf ('\n%d', i);

end

end

end