1. WAP to add, subtract, multiply, divide 2 numbers.

Source Code :

```
//WAP to add, subtract, multiply, divide 2 numbers.
#include<stdio.h>
#include<conio.h>
void main()
{
	int a, b;
	printf("Enter two numbers: ");
	scanf("%d %d",&a, &b);
	printf("\na=%d, b=%d\n",a,b);
	printf("%d + %d = %d\n", a, b, a+b);
	printf("%d - %d = %d\n", a, b, a-b);
	printf("%d * %d = %d\n", a, b, a*b);
	printf("%d / %d = %d\n", a, b, a/b);

	// return 0;
}
```

Output:

```
Enter two numbers: 10
10

a=10, b=10
10 + 10 = 20
10 - 10 = 0
```

10 * 10 = 100

10 / 10 = 1

2. WAP to calculate simple interest

```
// WAP to calculate simple interest
#include<stdio.h>
#include<conio.h>
int main()
{
	int p,t;
	float r,SI;
	printf("\nEnter Principal Amount= \n");
	scanf("%d",&p);
	printf("\nEnter time in years = \n");
	scanf("%d",&t);
	printf("\nEnter rate of interest= \n");
	scanf("%f",&r);
	SI=(p*r*t)/100;
	printf("\nCalculated Simple Interest: %f\n",SI);


	return 0;
}
```

Output:

Enter Principal Amount=

10000

Enter time in years =

2

Enter rate of interest=

10

Calculated Simple Interest: 2000.000000

3. WAP to find the area of triangle, rectangle and square

```
// WAP to find the area of  rectangle
#include <stdio.h>
#include <conio.h>
int main()
{
   //Area of rectangle
   int l,b,area;

   printf("\nEnter length : ");
   scanf("%d", &l);

   printf("\nEnter breadth : ");
   scanf("%d", &b);
```

```
    area=l*b;
    printf("\nCalcualted area of rectangle is: %d",area);

    return 0;
}
```

Output:

Enter length : 50

Enter breadth : 60

Calcualted area of rectangle is: 3000

// WAP to find the area of square

```
#include <stdio.h>
#include <conio.h>
int main()
{
    //Area of square
    int a,area;

    printf("\nEnter length of any side of square: ");
    scanf("%d", &a);

    area=a*a;
```

```
    printf("\nCalcualted area of square is: %d",area);

    return 0;
}
```

Output:

Enter length of any side of square: 50

Calcualted area of square is: 2500

// WAP to find the area of triangle

```
#include <stdio.h>
#include <conio.h>
int main()
{
    //Area of triangle
    int b,h,area;

    printf("\nEnter base of triangle : ");
    scanf("%d", &b);

    printf("\nEnter height of triangle : ");
    scanf("%d", &h);

    area= (b*h)/2;
```

```
    printf("\nCalcualted area of rectangle is: %d",area);

    return 0;
}
```

Output:

Enter base of triangle : 15

Enter height of triangle : 5

Calcualted area of rectangle is: 37

4. WAP to find the area and perimeter of a circle

```
// WAP to find the area and perimeter of a circle
#include<stdio.h>
#include<conio.h>
int main()
{
int r,pi=3.14 , area, perimeter;

        printf("\nEnter radius of Circle = ");
        scanf("%d",&r);
```

```
        area= pi*r*r;
        perimeter= 2*pi*4;

        printf("\nCalculated Area of circle= %d",area);
        printf("\nCalculated Perimeter of circle= %d",perimeter);

        return 0;
}
```

Output:

Enter radius of Circle = 25

Calculated Area of circle= 1875

Calculated Perimeter of circle= 24

5. WAP to find average of three numbers

```
// WAP to find average of three numbers
#include<stdio.h>
#include<conio.h>
int main()
{
        int a, b, c;
        float avg;
```

```
	printf("\nEnter three numbers: ");
	scanf("%d %d %d",&a, &b, &c);
	avg= ( a + b + c )/3;

	printf("\nThe avg of %d %d %d is= %f",a,b,c,avg);

	return 0;
}
```

Output:

```
Enter three numbers: 10
15
20

The avg of 10 15 20 is= 15.000000
```

6. WAP to calculate square of a number

```
// WAP to calculate square of a number
#include<stdio.h>
#include<conio.h>
int main()
{
	int a, square;
	printf("\nEnter a number: ");
	scanf("%d",&a);
```

```
        square= a*a;
        printf("\nCalculate square of %d is = %d",a,square);

        return 0;
}
```

Output:

Enter a number: 26

Calculate square of 26 is = 676

7. WAP to calculate cube of a number

```
// WAP to calculate cube of a number
#include<stdio.h>
#include<conio.h>
int main()
{
        int a,cube;
        printf("Enter a number: ");
        scanf("%d",&a);
        cube= a*a*a;
        printf("Cube of %d = %d ",a,cube);
```

```
    return 0;
}
```

Output:

Enter a number: 5

Cube of 5 = 125

8. WAP to swap the values of two variables by using third variable

```
// WAP to swap the values of two variables by using third variable
#include<stdio.h>
#include<conio.h>
int main()
{
    int a,b,temp;
    printf("\nEnter value of a:");
    scanf("%d",&a);
    printf("\nEnter value of b:");
    scanf("%d",&b);

    printf("\nvalue of a= %d \n vlaue of b= %d\n",a,b);
    temp=a;
    a=b;
    b=temp;
    printf("After swap value of a= %d\n After swap value of b=%d",a,b);

    return 0;
```

```
}
```

Output:

```
Enter value of a:25

Enter value of b:50

value of a= 25
 vlaue of b= 50
After swap value of a= 50
 After swap value of b=25
```

9. WAP to swap the values of two variables without using third variable

```
// WAP to swap the values of two variables without using third variable
#include<stdio.h>
#include<conio.h>
int main()
{
        int a,b;
        printf("\nEnter value of a:");
        scanf("%d",&a);
        printf("\nEnter value of b:");
        scanf("%d",&b);
```

```
	a=a+b;
	b=a-b;
	a=a-b;

	printf("\nAfter swap value of a = %d\nAfter swap value of b = %d",a,b);

	return 0;
}
```

Output:

Enter value of a:10

Enter value of b:20

After swap value of a = 20

After swap value of b = 10

10. WAP to calculate area of a cylinder.

```
// WAP to calculate area of a cylinder.
#include<stdio.h>
#include<conio.h>
int main()
{
		//Area of cylinder= 2*pi*r*h + 2*pi*r*r
```

```
    int r,h,area;
    float pi=3.14;

    printf("Enter radius of Cylinder: ");
    scanf("%d",&r);

    printf("Enter height of Cylinder: ");
    scanf("%d",&h);

    area= (2*pi*r*h) + (2*pi*r*r);

    printf("Calculate area of cylinder = %d",area);


    return 0;
}
```

Output:

Enter radius of Cylinder: 5

Enter height of Cylinder: 10

Calculate area of cylinder = 471

11. WAP to check whether entered number is positive or negative

```
// WAP to check whether entered number is positive or negative
#include<stdio.h>
```

```
#include<conio.h>
int main()
{
	int a;
	printf("\nEnter a number: ");
	scanf("%d",&a);

	if (a<0){
	   printf("\n%d is negative",a);
	}
	if (a==0)
	printf("\nEntered number is 0");

	if (a>0){
	printf("\nEntered number is positive");
	}
	printf("\nEntered number = %d",a);

	return 0;
}
```

Output:

Enter a number: -1

-1 is negative

Entered number = -1

12. WAP to print the larger and smaller of the two numbers

```
// WAP to print the larger and smaller of the two numbers
#include<stdio.h>
#include<conio.h>
int main()
{
	int a,b;
	printf("Enter two number: ");
	scanf("%d %d",&a,&b);
	if(a>b)
		printf("value of a = %d",a);
	else if(b>a)
		printf("value of b = %d",b);
	else if(a==b){
	   printf("a=b=%d",a);
	}

	return 0;
}
```

Output:

Enter two number: 99

98

value of a = 99

13. WAP to print whether the number is even or odd

```
// WAP to print whether the number is even or odd
#include<stdio.h>
#include<conio.h>
int main()
{
	int a;
	printf("\nEnter a number: ");
	scanf("%d",&a);
	// if(a==1)
	// printf("\nEntered number is odd");
	if(a%2==1){
	   printf("\nEntered number is odd");
	}
	else
	printf("\nEntered number is even");

	printf("\nEntered number= %d",a);

	return 0;
}
```

Output:

Enter a number: 55

Entered number is odd

Entered number= 55

14. WAP to compare greatest among three numbers

```
// WAP to compare greatest among three numbers
#include<stdio.h>
#include<conio.h>
int main()
{
        int a,b,c;
        printf("\nEnter three numbers: ");
        scanf("%d %d %d",&a, &b, &c);

        if(a>b){
           if(a>c)
           printf("\na = %d is greates among three",a);
           else
           printf("\nc = %d is greates among three",c);
        }

        else{
           if(b>c)
           printf("\nb = %d is greates among three",b);
           else
           printf("\nc = %d is greates among three",c);
        }
```

```
	return 0;
}
```

Output:

```
Enter three numbers: 25
15
5

a = 25 is greates among three
```

15. WAP to check leap year or not

```
// WAP to check leap year or not
#include<stdio.h>
#include<conio.h>
int main()
{
	int a;
	printf("\nEnter a  year: ");
	scanf("%d",&a);
	if (a%4 == 0){
	   printf("\nEntered year is leap year");
	}
	else
```

```
        printf("\nEntered year is not a leap year");


        return 0;
        }
```

Output:

Enter a year: 1868

Entered year is leap year

16. WAP to calculate mark sheet of a student (marks in betwee n 80 -- 100 then Grade A, marks in between 70-80 then Grade B, marks in between 60-70 then Grade C, less than 60 then Grade D)

```
// WAP to calculate mark sheet of a student (marks in between 80-
100 then Grade A, marks in between 70-80 then Grade B, marks in between 60-
70 then Grade C, less than 60 then Grade D)
#include<stdio.h>
#include<conio.h>
int main()
{
        int marks;
        printf("Enter marks: ");
        scanf("%d",&marks);


        if(marks>=80)
```

```
        printf("Grade: A");

    else if(marks>=70)
        printf("Grade: B");

    else if(marks>=60)
        printf("Grade: C");

    else
        printf("Grade: D");

    return 0;
}
```

Output:

Enter marks: 55

Grade: D

17. WAP to check whether a candidate is eligible for voting

```
// WAP to check whether a candidate is eligible for voting
#include<stdio.h>
#include<conio.h>
int main()
{
    int age;
    printf("\nEnter candidate's age: ");
```

```
	scanf("%d",&age);

	if(age>=18){
	   printf("\nCandidate can drive ; )");
	}
	else
		printf("Candidate can't drive");

	return 0;
}
```

Output:

```
Enter candidate's age: 18

Candidate can drive ; )
```

18. WAP to relate two numbers using =, > or < symbol

```
// WAP to relate two numbers using =, > or < symbol
#include<stdio.h>
#include<conio.h>
int main()
{
	int a,b;
	printf("Enter two number: ");
	scanf("%d %d",&a,&b);
	if(a>b)
```

```
        printf("%d > %d",a,b);

        else if(a<b)
        printf("%d < %d",a,b);

        else if(a=b)
        printf("%d = %d",a,b);

        return 0;
}
```

Output:

```
Enter two number: 25
26
25 < 26
```

While Programs

19. Print 1 to 10

```
// Print 1 to 10
#include<stdio.h>
#include<conio.h>
```

```
int main(){
int a;
a=1;
while(a<=10){
   printf("%d\n",a);
   a++;
}

return 0;
}
```

Output:

1

2

3

4

5

6

7

8

9

10

20. Reverse number of 10 to 1 gap between 2

// Reverse number of 10 to 1 gap between 2

```
#include<stdio.h>
#include<conio.h>
int main()
{
        int a=10;
        while(a>0){
           printf("%d\n",a);
           a=a-2;
        }

        return 0;
}
```

Output:

10

8

6

4

2

21. Sum of digits

```
// Sum of digits
#include<stdio.h>
#include<conio.h>
int main()
```

```
{
        int a,temp,sum=0,num;
        printf("Enter any number: ");
        scanf("%d",&a);
        num=a;
        while(temp>0){
           temp= a%10;
                    a=a/10;
           sum=sum+temp;
        }
        printf("The sum of digits of entered number %d is %d",num,sum);


        return 0;
}
```

Output:

Enter any number: 454

The sum of digits of entered number 454 is 13

22. Product of digits

```
// Product of digits
#include<stdio.h>
#include<conio.h>
int main()
{
        int a,temp,num,mult=1;
```

```
        printf("\nEnter any Number: ");
        scanf("%d",&a);
        num=a;
        while(a>0){
           temp=a%10;
           mult=mult*temp;
           a=a/10;
        }
        printf("\nMultiplication of digits of %d is = %d",num,mult);

        return 0;
}
```

Output:

Enter any Number: 454

Multiplication of digits of 454 is = 80

23. Factorial

```
//  Factorial
#include<stdio.h>
#include<conio.h>
int main()
{
        int a,fact,num;
```

```
    printf("Enter number to find factorial: ");
    scanf("%d",&a);
    num=a;
    fact=1;
    while(num>0){
       fact=fact*(num);
       num=num-1;

    }
    printf("factorial of %d is = %d",a,fact);

    return 0;
}
```

Output:

Enter number to find factorial: 5

factorial of 5 is = 120

Do-While Programs

24. Print 1 to 10 numbers

```
// Print 1 to 10 numbers
#include<stdio.h>
#include<conio.h>
int main()
```

```
{
        int a=1;
        do{
           printf("%d\n",a);
           a++;
        }while(a<11);

        return 0;
}
```

Output:

```
1
2
3
4
5
6
7
8
9
10
```

25. Count the digits in any number

```
// Count the digits in any number
#include<stdio.h>
```

```
#include<conio.h>
int main()
{
	int a,num,count=0;
	printf("Enter any number: ");
	scanf("%d",&a);
	// num=a;
	do{
	   // num= a%10;
	   a=a/10;
	   count++;

	}while(a>0);
	printf("No. of digits in number %d is %d",num,count);

	return 0;
}
```

Output:

```
Enter any number: 9896
No. of digits in number 2424832 is 4
```

26. Sums of digits of number

```
//Sums of digits of number
#include<stdio.h>
#include<conio.h>
```

```
int main()
{
        int a,temp,sum=0,num;
        printf("Enter any number: ");
        scanf("%d",&a);
        temp=a;
        num=a;
        do{
           temp=num%10;
           sum=sum+temp;
           num= num/10;
        }while(num>0);
        printf("sum of digits of %d is = %d",a,sum);

        return 0;
}
```

Output:

```
Enter any number: 56
sum of digits of 56 is = 11
```

For-Loop Programs

27. Print 1 to 10 numbers

```
// Print 1 to 10 numbers
#include<stdio.h>
#include<conio.h>
```

```
int main()
{
for(int i=1;i<11;i++){
   printf("%d\n",i);
}

return 0;
}
```

Output:

```
1
2
3
4
5
6
7
8
9
10
```

28. Reverse order difference of 2 number

```
        // Reverse order difference of 2 number
#include<stdio.h>
#include<conio.h>
int main()
{
        int i=10;
```

```
        for(i;i;i--) {
            printf("%d\n",i);
        }

        return 0;
}
```

Output:

```
10
9
8
7
6
5
4
3
2
1
```

29. Multiply positive number without using * operator

```
// Multiply positive number without using * operator
#include<stdio.h>
#include<conio.h>
int main()
{
        int a,b,mult=0;
        printf("Enter two numbers to be multiplied: ");
        scanf("%d %d",&a,&b);
```

```
    for(int i=1;i<=b;i++){
       mult=mult+a;
    }
    printf("Calculated Multiplication of %d and %d is %d",a,b,mult);

    return 0;
}
```

Output:

```
Enter two numbers to be multiplied: 5
3
Calculated Multiplication of 5 and 3 is 15
```

30. Sum of digit any number

```
// Sum of digit any number
#include<stdio.h>
#include<conio.h>
int main()
{
    int a,temp,sum=0,num;
    printf("Enter any number: ");
    scanf("%d",&a);
    temp=a;
    num=a;

    for(a;a>0;a=a/10) {
```

```
        temp=a%10;
        sum=sum+temp;

    }
    printf("Sum of digits of number %d is = %d",num,sum);

    return 0;
}
```

Output:

```
Enter any number: 54
Sum of digits of number 54 is = 9
```

31. Fibonacci series

```
// Fibonacii series
#include<stdio.h>
#include<conio.h>
int main()
{
    int fib, fib1=0,fib2=1,n;
    printf("Enter count limit for fibonacii series:" );
    scanf("%d",&n);
    printf("%d\n",fib1);
    printf("%d\n",fib2);
    // count=2;
```

```
        for(int count=2; count<=n;count++){
            fib=fib1+fib2;
            fib1=fib2;
            fib2=fib;
            printf("%d\n",fib);
            // count++;
        }

        return 0;
}
```

Output:

```
Enter count limit for fibonacii series:20
0
1
1
2
3
5
8
13
21
34
55
89
```

144

233

377

610

987

1597

2584

4181

6765

32.Sum of Fibonacii series up to n terms

```
// Sum of this series up to n terms
#include<stdio.h>
#include<conio.h>
int main()
{
        int fib,n,fib1,fib2,count,sum=0;
        printf("Enter no. of terms of Fibonacii series: ");
        scanf("%d",&n);
        fib1=0;
        fib2=1;
        // n=10;
        printf("%d\n",fib1);
        printf("%d\n",fib2);
        for(count=2;count<=n;count++){
           fib=fib1+fib2;
```

```
        fib1=fib2;
        fib2=fib;
        printf("%d\n",fib);
        sum=sum+fib;
}

    printf("Sum of first %d terms of fibonacii series is %d",n,sum);
    return 0;
}
```

Output:

0

1

1

2

3

5

Sum of first 5 terms of fibonacii series is 11

33. Pyramids

a) *
 * *
 * * *
 * * * *
 * * * * *

```
//Pyramids
```

```
#include<stdio.h>
#include<conio.h>
int main()
{
        int i,j,n;
        printf("Enter no. of lines to be printed in pyramid: ");
        scanf("%d",&n);
        for(i=1;i<=n;i++){
           for(j=1;j<=i;j++)
              printf("*");
           printf("\n");
        }

        return 0;
}
```

Output:

```
*
**
***
****
*****
******
*******
********
```

Programs of arrays

34.Array read and write from user

```
// Array read and write from user
#include <stdio.h>
#include <conio.h>
int main()
{
   int a[10];
   printf("Enter 10 array variables: ");

   for (int i = 0; i < 10; i++)
   {
      scanf("%d\n", &a[i]);
   }

   for (int i = 0; i < 10; i++)
   {
      printf("%d\n", a[i]);
   }
   // printf("%d",a);

   return 0;
}
```

Output:

21
31
41
55
66
77
88
99
101
201
11
21
31
41
55
66
77
88
99
101

35.Reverse of array

```
//Reverse of Array

#include <stdio.h>

#include <conio.h>

int main()

{

   int a[10], s, e, temp;
```

```
int b[10];
printf("Enter 10 array values: ");
s = 0;
e = 10;
for (int i = 0; i < 10; i++)
{
   scanf("%d", &a[i]);
}
printf("a string: \n");
for (int i = 0; i < 10; i++)
{
   printf("%d\n", a[i]);
}
for (int i = 0; i < 10; i++)
{
   b[i] = a[i];
}
for (int i = 0; i < 10; i++)
{
   temp = a[s];
   a[s] = b[e];
    b[e] = temp;
    s++;
   e--;
}

for (int i = 0; i < 10; i++)
```

```
    {
        printf("%d\n", b[i]);
    }

    return 0;
}
```

Output:

```
Enter 10 array values: 11
22
3
44
55
66
77
88
99
11
a string:
11
22
3
44
55
66
77
88
99
11
11
```

11
99
88
77
66
55
44
3
22

36.Finding largest in array

```
// Finding largest in array
#include<stdio.h>
#include<conio.h>
int main()
{
        int arr[10];
        int max;
        printf("Enter 10 array values: ");
          for (int i = 0; i < 10; i++)
          {
             scanf("%d", &arr[i]);
          }
        max=arr[0];
        for(int i=0;i<10;i++){
          if(max<arr[i]){
          max=arr[i];
```

```
        }
    }
    printf("largest array is %d\n",max);


    return 0;
}
```

Output:

```
Enter 10 array values: 11
21
33
44
55
66
88
8
56
96
```

37.Smallest number in array

```
// Smallest number in array
#include<stdio.h>
#include<conio.h>
int main()
{
    int arr[10];
    int min;
    printf("Enter 10 array values: ");
```

```
    for (int i = 0; i < 10; i++)
    {
        scanf("%d", &arr[i]);
    }
min=arr[0];
for(int i=0;i<10;i++){
    if(min>arr[i]){
    min=arr[i];
    }
}
printf("Minimum array is %d\n",min);


return 0;
}
```

Output:

```
Enter 10 array values: 1
2
3
74
5

56
5643
54
5
665
Minimum array is 1
```

38.Sum of array

```
// Sum of array
#include<stdio.h>
#include<conio.h>
int main()
{
	int arr[10], sum=0;
	printf("Enter 10 array variables: ");
	for(int i=0;i<10;i++){
	   scanf("%d",arr[i]);
	}
	for(int i=0; i<10;i++){
		sum=sum+arr[i];
	}
	printf("\nThe sum of array variable is: %d",sum);

	return 0;
}
```

39.Finding the particular value of array

```
// Finding the particular value of array
// Important program also no solution for "no element found"
#include<stdio.h>
```

```
#include<conio.h>
int main()
{
        int arr[20],i,search;
        printf("\nEnter array elements: ");
        for (i=0;i<20;i++)
           scanf("%d",&arr[i]);
        printf("\nEnter array element you want to search: ");
        scanf("%d",&search);
        for(i=0;i<20;i++){
           if(arr[i]==search){
            printf("\nElement %d found at location %d",arr[i-1],++i);
           break;
  }



        }
        return 0;
}
```

Output:

Enter array elements: 1
2
3
4
5
6
7
8

9
10
11
12

Enter array element you want to search: 10

Element 10 found at location 10

40.Matrix read and write

```
// Matrix read and write
#include <stdio.h>
#include <conio.h>
int main()
{
   int arr[3][3], i, j;
   printf("\nEnter matrix of order 3 x 3 row wise: ");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++)
      {
         scanf("%d", &arr[i][j]);
      }
   }
   printf("The array you entered: \n");
   for (i = 0; i < 3; i++)
   {
```

```
        for (j = 0; j < 3; j++)
            printf("\t%d\t", arr[i][j]);
        printf("\n");
    }

    return 0;
}
```

Output:

```
Enter matrix of order 3 x 3 row wise: 1
2
3
4
5
6
7
8
9
The array you entered:
        1       2       3
        4       5       6
        7       8       9
```

41.Matrix transpose

```
// Matrix transpose

#include <stdio.h>

#include <conio.h>
```

```
int main()
{
    int arr[3][3], i, j, temp;
    printf("\nEnter matrix of order 3 x 3 row wise: ");
    for (i = 0; i < 3; i++)
    {
        for (j = 0; j < 3; j++)
        {
            scanf("%d", &arr[i][j]);
        }
        // printf("\n");
    }
    //printing matrix before transpose
    printf("\nMatrix before transpose: \n");
    for (i = 0; i < 3; i++)
    {
        for (j = 0; j < 3; j++)
            printf("\t%d\t", arr[i][j]);
        printf("\n");
    }
    // Simply printing matrix values by swapping i to j
      printf("\nMatrix after transpose: \n");
    for (i = 0; i < 3; i++)
    {
        for (j = 0; j < 3; j++)
            printf("\t%d\t", arr[j][i]);
        printf("\n");
```

```
    }


    return 0;
}
```

Output:

```
Enter matrix of order 3 x 3 row wise: 1
2
3
4
5
6
7
8
9

Matrix before transpose:
        1       2       3
        4       5       6
        7       8       9

Matrix after transpose:
        1       4       7
        2       5       8
        3       6       9
```

42.Matrix addition

```
// Addition of Matrix
#include<stdio.h>
#include<conio.h>
int main(){
   int matrix1[3][3], matrix2[3][3],add[3][3], i, j;
   printf("\nEnter 1st Matrix of order 3 : ");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++){
         scanf("%d", &matrix1[i][j]);
      }
   }
   printf("\nEnter 2nd Matrix of order 3: ");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++){
         scanf("%d", &matrix2[i][j]);
      }
   }
   //printing addiion of two matrices directly
   printf("\nThe addition of 1st and 2nd matrix: \n");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++){
         printf("%d", matrix1[i][j] + matrix2[i][j]);
```

```
            printf("\t");
        }
        printf("\n");

    }

return 0;
}
```

Output:

```
Enter 2nd Matrix of order 3: 9
8
7
6
5
4
3
2
41

The addition of 1st and 2nd matrix:
10      10      10
10      10      10
10      10      50
```

43.Subtract

```
// Substraction of Matrix
// Addition of Matrix
#include<stdio.h>
#include<conio.h>
int main()
{
   int matrix1[3][3], matrix2[3][3],add[3][3], i, j, k;
   printf("\nEnter 1st Matrix of order 3 : ");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++){
         scanf("%d", &matrix1[i][j]);
      }
   }
   printf("\nEnter 2nd Matrix of order 3: ");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++){
         scanf("%d", &matrix2[i][j]);
      }
   }
   //printing substraction of two matrices directly
   printf("\nThe addition of 1st and 2nd matrix: \n");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++){
         printf("%d", matrix1[i][j] - matrix2[i][j]);
```

```
            printf("\t");
        }
        printf("\n");

    }


return 0;
}
```

Output:

```
Enter 1st Matrix of order 3 : 1
2
3
4
5
6

7
8
9

Enter 2nd Matrix of order 3: 9
8
7
6
5
4
3
```

2
1

The addition of 1st and 2nd matrix:
-8 -6 -4
-2 0 2
4 6 8

44.Multiplication

```
// Multiplication of Matrices


#include <stdio.h>
#include <conio.h>
int main()
{
   int matrix1[3][3], matrix2[3][3], mult[3][3], i, j, k;
   printf("\nEnter 1st Matrix of order 3 : ");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++)
      {
         scanf("%d", &matrix1[i][j]);
      }
   }
   printf("\nEnter 2nd Matrix of order 3: ");
   for (i = 0; i < 3; i++)
   {
      for (j = 0; j < 3; j++)
```

```
    {
        scanf("%d", &matrix2[i][j]);
    }
}

  //muliplying matrices

for (i = 0; i < 3; i++)
{
    for (j = 0; j < 3; j++)
     {
         mult [i][j] = 0;
        for (k = 0; k < 3; k++)
        {
            mult[i][j] += matrix1[i][k] * matrix2[k][j];
        }
    }
}
// printing multiplicatiton matrix :
printf("\nMatrix 1st  x  Matrix 2 :\n");
for (i = 0; i < 3; i++)
{
    for (j = 0; j < 3; j++)
    {
        printf("%d", mult[i][j]);
        printf("\t");
    }
```

```
        printf("\n");
    }


    return 0;
}
```

Output:

```
Enter 1st Matrix of order 3 : 1
2
3
4
5
6
7
8
9

Enter 2nd Matrix of order 3: 9
8
7
6
5
4
3

2
1

Matrix 1st  x  Matrix 2 :
30      24      18
84      69      54
```

Program of Function

45.Calculator

```
// Simple Calculator
#include <stdio.h>
#include <conio.h>
int calc(int a, char op, int b)
{
   float result;
   switch (op)
   {
   case '+':
      result = a + b;
      break;

   case '-':
      result = a - b;
      break;

   case '*':
      result = a * b;
      break;

   case '/':
      result = a / b;
```

```
        break;

    default:
        printf("Invalid operator");
    }
    return result;
}

int main()
{
    int a, b;
    float result;
    char op;
    printf("\n\t***Welcome to Simple Calculator***\n");
    printf("\nEnter number1, operator(+,-,/,*) and number2 :");
        scanf("%d %c %d", &a, &op, &b);
    result = calc(a, op, b);
    printf("\n %d %c %d = %.2f", a, op, b, result);

    return 0;
}
```

Output:

```
***Welcome to Simple Calculator***

Enter number1, operator(+,-,/,*) and number2 :5*10
```

5 * 10 = 50.00

46.Write a solve a quadratic equation

```
// Write a solve a quadratic equation
#include <math.h>
#include <stdio.h>
int main() {
   double a, b, c, discriminant, root1, root2, realPart, imagPart;
   printf("Enter coefficients a, b and c: ");
   scanf("%lf %lf %lf", &a, &b, &c);

   discriminant = b * b - 4 * a * c;

   // condition for real and different roots
   if (discriminant > 0) {
      root1 = (-b + sqrt(discriminant)) / (2 * a);
      root2 = (-b - sqrt(discriminant)) / (2 * a);
      printf("root1 = %.2lf and root2 = %.2lf", root1, root2);
   }

   // condition for real and equal roots
   else if (discriminant == 0) {
      root1 = root2 = -b / (2 * a);
      printf("root1 = root2 = %.2lf;", root1);
   }
```

```
    // if roots are not real
    else {
        realPart = -b / (2 * a);
        imagPart = sqrt(-discriminant) / (2 * a);
        printf("root1 = %.2lf+%.2lfi and root2 = %.2f-%.2fi", realPart, imagPart, realPart, imagPart);
    }

    return 0;
}
```

```
Enter coefficients a, b and c: 5
50
10
root1 = -0.20 and root2 = -9.80
```

47.Factorial of a number

```
// Factorial of a number
#include<stdio.h>
#include<conio.h>
long int multiplyNumbers(int n);
int main()
{
    int n;
    printf("Enter a positive integer: ");
    scanf("%d",&n);
    printf("Factorial of %d = %ld", n, multiplyNumbers(n));
    return 0;
```

```
}

long int multiplyNumbers(int n) {
   if (n>=1)
      return n*multiplyNumbers(n-1);
   else
      return 1;
}
```

Enter a positive integer: 5
Factorial of 5 = 120

48.Fibonacci series

```
// Fibonacci series
#include<stdio.h>
#include<conio.h>

int main()
{
 int n1=0,n2=1,n3,i,number;
 printf("Enter the number of elements:");
 scanf("%d",&number);
 printf("\n%d %d",n1,n2);//printing 0 and 1
 for(i=2;i<number;++i)//loop starts from 2 because 0 and 1 are already printed
 {
  n3=n1+n2;
```

```
 printf(" %d",n3);
 n1=n2;
 n2=n3;
}
 return 0;
}
```

49.Sum of digits of any number

```
// Sum of digits of any number
#include<stdio.h>
#include<conio.h>
 int main()
{
int n,sum=0,m;
printf("Enter a number:");
scanf("%d",&n);
while(n>0)
{
m=n%10;
sum=sum+m;
n=n/10;
}
printf("Sum is=%d",sum);
return 0;
}
```

50. Sum of square up-to n number

```
// Sum of square upto n number

#include <stdio.h>

#include<conio.h>


void main()

{

  int i,n,sum=0;

  printf("Input the number of terms : ");

  scanf("%d",&n);

  printf("\nThe square natural upto %d terms are :",n);

  for(i=1;i<=n;i++)

  {

    printf("%d  ",i*i);

    sum+=i*i;

  }

  printf("\nThe Sum of Square Natural Number upto %d terms = %d \n",n,sum);

}
```

51.Write a program to check number is even or odd

```
// Write a program to check number is even or odd
```

```
#include <stdio.h>
#include<conio.h>
int main() {
   int num;
   printf("Enter an integer: ");
   scanf("%d", &num);

   // True if num is perfectly divisible by 2
   if(num % 2 == 0)
      printf("%d is even.", num);
   else
      printf("%d is odd.", num);

   return 0;
}
```

52.Largest among three numbers

```
#include <stdio.h>
#include <conio.h>
int largestNumber(int a,int b ,int c);//function prototype
int main()
{
   int a,b,c;
   printf("Enter the three numbers\n");
```

```
    scanf("%d%d%d",&a,&b,&c);

    int result=largestNumber(a,b,c);//function call
    printf("Biggest number is: %d\n",result);

    getch();
    return 0;
}
int largestNumber(int a,int b,int c){//function definition with parameter
if(a>b)
{
    if(a>c)
    return a;
    else
        return c;
}
else
{
    if(b>c)
        return b;
    else
        return c;
}
}
```

Program in String

53. String read & write

```
// String read & write
#include<stdio.h>
#include<conio.h>
int main()
{
	char st[20];
	printf("\nEnter string: ");
	scanf("%s",st);
	printf("\n%s",st);

	return 0;
}
```

54) String read using gets & puts

```
// String read using gets & puts
#include<stdio.h>
#include<conio.h>
int main()
{
	char st[20];
	printf("\nEntter string: ");
	gets(st);
	puts(st);

	return 0;
}
```

Sting library function

56.Copy String

```
// Sting library function str copy
#include<stdio.h>
#include<conio.h>
#include<string.h>
int main()
{
	char st1[20],st2[20];
	gets(st1);
	strcpy(st2,st1);
	puts(st2);


	return 0;
}
```

57.Length of String

```
// Sting library function str length
#include <stdio.h>
#include<conio.h>
#include <string.h>
int main()
{
```

```
    char str1[20] = "I am shubham";
    printf("Length of string str1: %d", strlen(str1));
    return 0;
}
```

Output:

Length of string str1: 12

58.Join String

```
#include <stdio.h>
#include <string.h>
int main()
{
    char s1[10] = "Hello ";
    char s2[10] = "World";
    strcat(s1,s2);
    printf("Output string after concatenation: %s", s1);
    return 0;
}
```

Output:

Output string after concatenation: Hello World

59.Compare String

```
#include <stdio.h>
```

```
#include <string.h>
int main()
{
    char s1[20] = "I am Shubham";
    char s2[20] = "Dahiya";
    /* below it is comparing first 8 characters of s1 and s2*/
    if (strncmp(s1, s2, 8) ==0)
    {
       printf("string 1 and string 2 are equal");
    }else
    {
       printf("string 1 and 2 are different");
    }
    return 0;
}
```

Output:

string 1 and 2 are different

Pointer Programs

60.Print address of variable using address operator

```
// Print address of variable using address operator
#include <stdio.h>
#include<conio.h>

int main()
{
```

```
 int a;
 int *pt;

        printf("Pointer  Program : Print Pointer Address\n");
        a = 10;
        pt = &a;

        printf("\n[a  ]:Value of A = %d", a);
        printf("\n[*pt]:Value of A = %d", *pt);
        printf("\n[&a ]:Address of A = %p", &a);
        printf("\n[pt ]:Address of A = %p", pt);
        printf("\n[&pt]:Address of pt = %p", &pt);
        printf("\n[pt ]:Value of pt = %p", pt);

        return 0;
}
```

Output:

```
[a  ]:Value of A = 10
[*pt]:Value of A = 10
[&a ]:Address of A = 0061FF1C
[pt ]:Address of A = 0061FF1C
[&pt]:Address of pt = 0061FF18
[pt ]:Value of pt = 0061FF1C
```

61.Show Arithmetic pointer

```
// pointer arithmetic
```

```
#include<stdio.h>
#include<conio.h>

int main()
{
        int number=50;
        int *p;//pointer to int
        p=&number;//stores the address of number variable
        printf("Address of p variable is %u \n",p);
        p++;
        printf("After increment: Address of p variable is %u \n",p); // in this case, p will get incre
        mented by 4 bytes.
        return 0;
}
```

Output:

Address of p variable is 6422296

After increment: Address of p variable is 6422300

62.Understand Pointer to Pointer

```
// pointer to pointer
#include <stdio.h>
#include<conio.h>

int main ()
 {
```

```
   int  var;
   int  *ptr;
   int  **pptr;

   var = 3000;

   /* take the address of var */
   ptr = &var;

   /* take the address of ptr using address of operator & */
   pptr = &ptr;

   /* take the value using pptr */
   printf("Value of var = %d\n", var );
   printf("Value available at *ptr = %d\n", *ptr );
   printf("Value available at **pptr = %d\n", **pptr);

   return 0;
}
```

Output:

Value of var = 3000

Value available at *ptr = 3000

Value available at **pptr = 3000

Searching

63.Linear searching

```
// Linear searching
#include <stdio.h>
#include <conio.h>
int main()
{
  int array[20], search, c, n;

  printf("Enter number of elements in array\n");
  scanf("%d", &n);

  printf("Enter %d integer(s)\n", n);

  for (c = 0; c < n; c++)
    scanf("%d", &array[c]);

  printf("Enter a number to search\n");
  scanf("%d", &search);

  for (c = 0; c < n; c++)
  {
    if (array[c] == search)    /* If required element is found */
    {
      printf("%d is present at location %d.\n", search, c+1);
      break;
```

```
    }
  }
  if (c == n)
    printf("%d isn't present in the array.\n", search);

  return 0;
}
```

Output:

```
Enter number of elements in array
5
Enter 5 integer(s)
15
635
315
25
15
Enter a number to search
315
315 is present at location 3.
```

64.Binary Searching

```
// Binary Search
#include <stdio.h>
#include <conio.h>
int main()
{
```

```
int i, low, high, mid, n, key, array[20];
printf("Enter number of elementsn");
scanf("%d", &n);
printf("Enter %d integersn", n);
for (i = 0; i < n; i++)
   scanf("%d", &array[i]);
printf("Enter value to findn");
scanf("%d", &key);
low = 0;
high = n - 1;
mid = (low + high) / 2;
while (low <= high)
{
   if (array[mid] < key)
      low = mid + 1;
   else if (array[mid] == key)
   {
      printf("%d found at location %d.n", key, mid + 1);
      break;
   }
   else
      high = mid - 1;
   mid = (low + high) / 2;
}
if (low > high)
   printf("Not found! %d isn't present in the list.n", key);
return 0;
```

}

Output:

Enter number of elementsn8

Enter 8 integersn1

8

9

11

17

25

35

45

Enter value to findn35

35 found at location 7.n

Sorting

65.Bubble Sorting

```
// Bubble Sort
#include <stdio.h>
#include <conio.h>

void swap(int *xp, int *yp)
```

```
{
    int temp = *xp;
    *xp = *yp;
    *yp = temp;
}

// function for bubble sort
void bubbleSort(int arr[], int n)
{
   int i, j;
   for (i = 0; i < n-1; i++)

       // Last i elements are already in place
       for (j = 0; j < n-i-1; j++)
           if (arr[j] > arr[j+1])
               swap(&arr[j], &arr[j+1]);
}

/* Function to print an array */
void printArray(int arr[], int size)
{
    int i;
    for (i=0; i < size; i++)
        printf("%d ", arr[i]);
    printf("\n");
}
```

```
// Driver program to test above functions
int main()
{
   int arr[] = {64, 34, 25, 12, 22, 11, 90};
   int n = sizeof(arr)/sizeof(arr[0]);
   bubbleSort(arr, n);
   printf("Sorted array: \n");
   printArray(arr, n);
   return 0;
}
```

Output:

Sorted array:
11 12 22 25 34 64 90