PROGRAMMING FUNDAMENTALS

Let's explore technology together to live in the future

Checkout more on
https://github.com/Sy-hash-collab

Sy-hash-collab

CONDITIONAL STRUCTURES

1. **Write a program to find the largest, smallest and average of n whole numbers assume that 'n' has been set by user.**

```cpp
#include <iostream>
using namespace std;
int main()
{
    int n;
    cout << "Enter the value of n: ";
    cin >> n;
    int num, largest, smallest, sum = 0;
    cout << "Enter " << n << " numbers: ";
    cin >> num;
    largest = smallest = num;
    sum += num;
    for (int i = 1; i < n; i++)
    {
        cin >> num;
        if (num > largest)
        {
            largest = num;
        }
        if (num < smallest)
        {
            smallest = num;
        }
        sum += num;
    }
    double average = (double) sum / n;
    cout << "Largest number: " << largest << endl;
    cout << "Smallest number: " << smallest << endl;
    cout << "Average: " << average << endl;
    return 0;
}
```

Enter the value of n: 6
Enter 6 numbers: 3
4
5

8 9 3 Largest number: 9

Smallest number: 3

Average: 5.33333

Write a program in c++ that inputs a series of 20 numbers and displays the minimum value.

```cpp
#include <iostream>
using namespace std;
int main()
{



   int num[20];
 int min = 999999;
cout << "Enter 20 numbers:" << endl;
   for (int i = 0; i < 20; i++)
   {
      cin >> num[i];

      if (num[i] < min)
      {
         min = num[i];
      }
   }
 cout << "The minimum value is: " << min << endl;
      return 0;
}
```

Write a program in c++ that inputs a number from the user and displays all prime numbers which are less than input number using loop

```cpp
#include <iostream>
using namespace std;

int main()
{
int num, i, j;
 bool isPrime;
 cout << "Enter a number: ";
 cin >> num;
 cout << "Prime numbers less than " << num << " are: " << endl;
```

```cpp
    for (i = 2; i < num; i++)
    {
        isPrime = true;
        for (j = 2; j <= i / 2; j++)
        {
            if (i % j == 0)
            {
                isPrime = false;
                break;
            }
        }
        if   ( i s P r i m e )
        {
            cout << i << " ";
        }
    }
    cout << endl;
    return 0;
}
```

Output :

Enter a number: 6

Prime numbers less than 6 are:

2 3 5

Write a program in c++ that inputs a number and display its factorial it asks user whether he wants to calculate another factorial or not . If user inputs 1 it again input a number and calculate factorial . If user enter 0 program terminates.

```cpp
#include <iostream>
using namespace std;
int main()
{
    int num, fact;
    char choice;
    do {
        fact = 1;
        cout << "Enter a number to find its factorial: ";
        cin >> num;
        for (int i = 1; i <= num; i++)
        {
            fact *= i;
```

```cpp
    }
    cout << "Factorial of " << num << "  i
```

```cpp
    cout << "Do you want to calculate another factorial? (1/0): ";
    cin >> choice;
  }
  while (choice == '1');
  return 0;
}
```

Enter a number to find its factorial: 6

Factorial of 6 is 720

Do you want to calculate another factorial? (1/0): 1

Enter a number to find its factorial: 4

Factorial of 4 is 24

Do you want to calculate another factorial? (1/0): 0

<u>Write a program that inputs an integer and displays whether it is prime number or not .</u>

```cpp
#include <iostream>
using namespace std;
int main()
{
   int n, i;
  bool isPrime = true;
   cout << "Enter a positive integer: ";
   cin >> n;
   if (n <= 1)
   {
     isPrime = false;
   }
   else
   {
     for (i = 2; i <= n / 2; ++i)
     {
       if (n % i == 0)
       {
         isPrime = false;
         break;
       }
     }
```

```cpp
  }
 if (isPrime)
   {
      cout << n << " is a prime number" << endl;
   }
   else
   {
      cout << n << " is not a prime number" << endl;
   }
   return  0 ;
}
```

Output ;

Enter a positive integer: 6

6 is not a prime number

Write a program in c++ that continously inputs positive integer values from user . The user enters a zero to show that he has no more values to enter . The program should finally display the second largest number entered

```cpp
#include <iostream>
using namespace std;
int main()
{
   int largest = 0, second_largest = 0, num;
   do {
      cout << "Enter a positive integer (or 0 to stop): ";
      cin >> num;
      if (num > largest)
       {
         second_largest = largest;
         largest = num;
      }
      else if (num > second_largest && num
      {
         second_largest = num;
      }
   }
   while (num != 0);
 cout << "The second largest number entered was: " << second_largest << endl;
   return 0;
```

} **Output :** Enter a positive integer (or 0 to stop): 44

Enter a positive integer (or 0 to stop): 66

Enter a positive integer (or 0 to stop): 89 Enter a positive integer
(or 0 to stop): 0 The second largest number entered was: 66

Write a program in C++ to find the first 10 natural numbers.

#include<iostream> using namespace std; int main()

{

```
    int n;
    cout<<"The first 10 natural numbers are : "<<endl;
    for (n=1 ; n <=10 ; n++ )
    {
        cout<<n;
    }
    return 0;
}
```

Output :

The natural numbers are:
1 2 3 4 5 6 7 8 9 10

Write a program in C++ to find the sum of the first 10 natural numbers.

```
#include<iostream>
using namespace std;
int main ()
{

    int n,sum=0;
    cout<<"The first 10 natural numbers are : "<<endl;
    for( n=1 ; n<=10 ; n++ )
    {
        cout<<n;
        sum += n;

    }
    cout<<endl;
```

```cpp
    cout<<"The sum of first 10 natural numbers is = "<<sum;
}
```

Output :

The first 10 natural numbers are :

12345678910

The sum of first 10 natural numbers is = 55

Write a program in C++ to find the perfect numbers between 1 and 500.

```cpp
#include <iostream>

using namespace std;

int main()

{

  cout << "Find the perfect numbers between 1 and 500: " <<endl;


  int i = 1, u = 1, sum = 0;

  cout << "The perfect numbers between 1 to 500 are: "<<endl;

  while (i <= 500)

  {

  while (u <= 500)

    {

      if (u < i)

      {

        if (i % u == 0)

          sum = sum + u;

      }

      u++;

    }

 if (sum == i)

    {
```

```cpp
        cout << i << " " << "\n";

    }

   i + + ;

   u    =    1 ;

 sum = 0;

 }

}
```

Output :

 Find the perfect numbers between 1 and 500:

 The perfect numbers between 1 to 500 are:

6

28

496

Write a program in C++ to find the factorial of a number.

```cpp
#include<iostream>

using namespace std;

int main( )

{

   int num,fac=1;

   cout<<"Enter a number to find its factorial : ";

   cin>>num;

   for ( int a= 1 ; a<=num ; a++ )

   {

    fac = fac * a;

   }

 cout<<"The factorial of given number is = "<<fac;
```

} **Output :** Enter a number to find its factorial : 6 The factorial of given number is = 720

<u>Write a program in C++ to find the last prime number that occurs before the entered number.</u>

```cpp
#include <iostream>

using namespace std; int main() {

    int num1, ctr = 0;

    cout << "Find the last prime number occurs before the entered number: " <<endl;

    cout << "Enter a number to find the last prime number occurs before the number: " <<endl;
    cin >> num1;

    for (int n = num1 - 1; n >= 1; n--)

    {

        for (int m = 2; m < n; m++)

        {

            if (n % m == 0)

                ctr++;

        }

        if (ctr == 0)

        {

            if (n == 1)

            {
```

```cpp
        cout << "no prime number less than 2";

        break;
      }
      cout << n << " is the last prime n

      break;
    }

    ctr = 0;

  }

  return 0;

}
```

Output :

Find the last prime number occurs before the entered number:

Enter a number to find the last prime number occurs before the number:

60

59 is the last prime number before 60

Write a program in C++ to find the Greatest Common Divisor (GCD) of two numbers.

```cpp
#include <iostream>

using namespace std;

int main()

{

   int num1, num2, gcd;

 cout << "Find the Greatest Common Divisor of two numbers:"<<endl;

cout << " Input the first number: ";

cin >> num1;

 cout << " Input the second number: ";

 cin >> num2;
```

```cpp
    for (int i = 1; i <= num1 && i <= num2; i++)

    {

        if (num1 % i == 0 && num2 % i == 0)

        {

            gcd = i;

        }

    }

    cout << " The Greatest Common Divisor is: " << gcd << endl;

        return 0;

}
```

Output :

Find the Greatest Common Divisor of two numbers:

Input the first number: 40

Input the second number: 60

 The Greatest Common Divisor is: 20

Write a program in C++ to find the sum of the digits of a given number.

```cpp
#include <iostream>

using namespace std;

int main()

{

    int num1, num2, r, sum=0;

    cout << "Find the sum of digits of a given number:"<<endl;;

    cout << " Input a number: ";

    cin >> num1;

    num2 = num1;

    while (num1 > 0)
```

```cpp
    {
        r = num1 % 10;

        num1 = num1 / 10;

        sum = sum + r;

    }

    cout << " The sum of digits of " << num2 << " is: " << sum << endl;

}
```

Output :

Find the sum of digits of a given number:

Input a number: 12345

The sum of digits of 12345 is: 15

Write a program in C++ to find the sum of the series 1 + 1/2^2 + 1/3^3 + …..+ 1/n^n.

```cpp
#include<iostream>

int main()

{

    double sum = 0, a;

    int n, i;

    cout << "Find the sum of the series 1 + 1/2^2 + 1/3^3 +.....+ 1/n^n:"<<endl;

    cout << " Input the value for nth term: ";

    cin >> n;

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

    {

        a = 1 / pow(i, i);

        cout << "1/" << i << "^" << i << " = " << a << endl;

        sum += a;

    }
```

```cpp
        cout << " The sum of the above series is: " << sum << endl;

}
```

Output :

Find the sum of the series 1 + 1/2^2 + 1/3^3 +.....+ 1/n^n:

 Input the value for nth term: 6

1/1^1 = 1

1/2^2 = 0.25

1/3^3 = 0.037037

1/4^4 = 0.00390625

1/5^5 = 0.00032

1/6^6 = 2.14335e-005

The sum of the above series is: 1.29128

Write a program in C++ to calculate the sum of the series (1*1) + (2*2) + (3*3) + (4*4) + (5*5) + ... + (n*n).

```cpp
int main()

{

    int i, n, sum = 0;

cout <<"Find the sum of the series (1*1) + (2*2) + (3*3) + (4*4) + (5*5) + ... + (n*n):"<<endl;


    cout << " Enter the value for nth term: ";

    cin >> n;


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

    {

        sum += i * i;

        cout << i << "*" << i << " = " << i * i << endl;
```

```
        }
```

cout << " The sum of the above series is: " << sum << endl; } **Output :**

Find the sum of the series (1*1) + (2*2) + (3*3) + (4*4) + (5*5) + ... + (n*n):

 Enter the value for nth term: 6

1*1 = 1

2*2 = 4 3*3 = 9 4*4 = 16 5*5 = 25 6*6 = 36 The sum of the above series is: 91 **Write a**

program in C++ to calculate the series (1) + (1+2) + (1+2+3) + (1+2+3+4) + ... +
(1+2+3+4+...+n).

```
#include <iostream>

using namespace std;
```

```
int main()

{

   int i, j, n, sum = 0, tsum;

 cout << "\n\n Find the sum of the series (1) + (1+2) + (1+2+3) + (1+2+3+4) + ... +
(1+2+3+4+...+n):"<<endl;
 cout << " Input the value for nth term: ";

   cin >> n;

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

   {
```

```cpp
        tsum = 0;
        for (j = 1; j <= i; j++)
        {
            sum += j;
            tsum += j;
            cout << j;
            if (j < i)
            {
                cout << "+";
            }
        }
        cout << " = " << tsum << endl;
    }
    cout << " The sum of the above series is: " << sum << endl;
}
```

Output :

Find the sum of the series (1) + (1+2) + (1+2+3) + (1+2+3+4) + ... + (1+2+3+4+...+n):

Input the value for nth term: 6

1 = 1

1+2 = 3

1+2+3 = 6

1+2+3+4 = 10

1+2+3+4+5 = 15

1+2+3+4+5+6 = 21

The sum of the above series is: 5

Write a program in C++ to find the sum of series 1 - X^2/2! + X^4/4!-.... upto nth term.

```cpp
#include <iostream>
#include <math.h>
using namespace std;
int main()
{
    float x, sum, term, fct, y, j, m;
    int i, n;
    y = 2;
cout << "\n\n Find the sum of the series 1 - X^2/2! + X^4/4!-....:"<<endl;
    cout << " Input the value of X: ";
    cin >> x;
 cout << " Input the value for nth term: ";
cin >> n;
sum = 1;
 term = 1;
 cout << " term 1 value is: " << term << endl;
   for (i = 1; i < n; i++)
   {
      fct = 1;
      for (j = 1; j <= y; j++)
      {
         fct = fct * j;
      }
      term   =   term   *   ( - 1 ) ;
      m = pow(x, y) / fct;
      m = m * term;
```

```cpp
        cout << " term " << i + 1 << " value is: " << m << endl;

        sum = sum + m;

        y += 2;

    }

 cout << " The sum of the above series is: " << sum << endl;

}
```

Output :

 Find the sum of the series 1 - X^2/2! + X^4/4!-....:

 Input the value of X: 6

Input the value for nth term: 6

term 1 value is: 1

term 2 value is: -18

term 3 value is: 54

term 4 value is: -64.8

 term 5 value is: 41.6571

 term 6 value is: -16.6629

 The sum of the above series is: -2.80572

Write a C++ program to list non-prime numbers from 1 to an upperbound.

```cpp
#include <iostream>

#include <cmath>

using namespace std;

int main()

{

    int ult;

 cout << "\n\n List non-prime numbers from 1 to an upperbound:\n";

 cout << " Input the upperlimit: ";
```

```cpp
    cin >> ult;

    cout << " The non-prime numbers are: " << endl;

    for (int num = 2; num <= ult; ++num)

        {

            int mfactor = (int)sqrt(num);

            for (int fact = 2; fact <= mfactor ; ++fact)

            {

                if (num % fact == 0)

                {

                    cout << num << " ";

                    break;

                }

            }

        }

        cout << endl;

        return 0;

}
```

Output :

List non-prime numbers from 1 to an upperbound:

Input the upperlimit: 6

The non-prime numbers are:

4 6

Write a program in C++ to print a square pattern with the # character.

```cpp
#include <iostream>

using namespace std;
```

```cpp
int main()
{
    int size;
    cout << " Print a pattern like square with # character: "<<endl;
    cout << " Input the number of characters for a side: ";
    cin >> size;
    for (int row = 1; row <= size; ++row)
    {
        for (int col = 1; col <= size; ++col)
        {
            cout << "# ";
        }
        cout << endl;
    }
    return 0;
}
```

Output :

Print a pattern like square with # character:

Input the number of characters for a side: 6

# # # # # #

# # # # # #

# # # # # #

# # # # # #

# # # # # #

# # # # # #

Write a program in C++ to display the cube of the number up to an integer.

```cpp
#include <iostream>
using namespace std;
int main()
{
    int i, ctr, cub;
    cout << "Display the cube of the numbers upto a given integer:"<<endl;
    cout << "Input the number of terms : ";
    cin >> ctr;
    for (i = 1; i <= ctr; i++)
    {
        cub = i * i * i;
        cout << "Number is : " << i << " and the cube of " << i << " is: " << cub << endl;
    }
}
```

Output :

Display the cube of the numbers upto a given integer:

Input the number of terms : 6

Number is : 1 and the cube of 1 is: 1

Number is : 2 and the cube of 2 is: 8

Number is : 3 and the cube of 3 is: 27

Number is : 4 and the cube of 4 is: 64

Number is : 5 and the cube of 5 is: 125

Number is : 6 and the cube of 6 is: 216

Write a program in C++ to display the multiplication table vertically from 1 to n.

```cpp
#include <iostream>
using namespace std;
```

```
int main()
{
    int j, i, n;
    cout << "Display the multipliaction table vertically from 1 to n: "<<endl;
    cout << "Input the number upto 5: ";
    cin >> n;
    cout << "Multiplication table from 1 to " << n << endl;
    for (i = 1; i <= 10; i++)
    {
        for (j = 1; j <= n; j++)
        {
            if (j <= n - 1)
                cout << j << "x" << i << "= " << i * j;
            else
                cout << j << "x" << i << "= " << i * j;
        }
        cout << endl;
    }
}
```

Output : Display the multipliaction table vertically from 1 to n: Input the number upto 5: 6

Multiplication table from 1 to 6 1 x 1 = 1 2 x 1 = 2 3 x 1 = 3 4 x 1 = 4 5 x 1 = 5 6 x 1 = 6

1x2= 2 2x2= 4 3x2= 6 4x2= 8 5x2= 10 6x2= 12

1x4= 42x4= 83x4= 124x4= 165x4= 206x4= 24

1x5= 52x5= 103x5= 154x5= 205x5= 256x5= 30

1x6= 62x6= 123x6= 184x6= 245x6= 306x6= 36

1x7= 72x7= 143x7= 214x7= 285x7= 356x7= 42

1x8= 82x8= 163x8= 244x8= 325x8= 406x8= 48

1x9= 92x9= 183x9= 274x9= 365x9= 456x9= 54

1x10= 102x10= 203x10= 304x10= 405x10= 506x10= 60

Write a C++ program that displays the sum of n odd natural numbers.

```cpp
#include<iostream>

using namespace std;

int main( )

{

    int i,n,sum;

    cout<<"Enter the number of terms : ";

    cin>>n;

    cout<<"The odd numbers are : "<<endl;

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

    {

        cout<<2*i-1<<" ";

        sum += 2 * i - 1;

    }

    cout<<endl;

    cout<<"The sum of odd natural numbers upto "<<n<<" terms = "<<sum;

}
```

Output :

Enter the number of terms : 6

The odd numbers are :

1 3 5 7 9 11

The sum of odd natural numbers upto 6 terms = 69

Write a C++ program that displays the sum of the n terms of even natural numbers

```cpp
#include< iostream>

using namespace std;

int main()

{

    int i, n, sum = 0;

 cout << "Display n terms of even natural number and their sum: "<<endl;

cout << "Enter the number of terms: ";

    cin >> n;

 cout << "The even numbers are: ";

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

   {

      cout << 2 * i << " ";

      sum += 2 * i ;

   }

   c o u t < < e n d l ;

 cout << "The Sum of even Natural Numbers upto " << n << " terms: " << sum << endl;

}
```

Output :

Display n terms of even natural number and their sum:

Enter the number of terms: 6

The even numbers are: 2 4 6 8 10 12

The Sum of even Natural Numbers upto 6 terms: 42

Write a program in C++ to display the n terms of a harmonic series and their sum.

```cpp
#include <iostream>
using namespace std;
int main()
{
    int i, n;
    float s = 0.0;
 cout << " Display n terms of harmonic series and their sum:"<<endl;
cout << " The harmonic series: 1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms"<<endl;
cout << " Input number of terms: ";
    cin >> n;
    for (i = 1; i <= n; i++)
    {
       if (i < n)
       {
          cout << "1/" << i << " + ";
          s += 1 / (float)i;
       }
       i f   ( i   = =   n )
       {
          cout << "1/" << i;
          s += 1 / (float)i;
       }
    }
    cout<<endl;
 cout << "The sum of the series upto " << n << " terms: " << s << endl;
```

}

Output :

 Display n terms of harmonic series and their sum:

 The harmonic series: 1 + 1/2 + 1/3 + 1/4 + 1/5 … 1/n terms

 Input number of terms: 6

1/1 + 1/2 + 1/3 + 1/4 + 1/5 + 1/6

The sum of the series upto 6 terms: 2.45

Write a program in C++ to display the sum of the series [1+x+x^2/2!+x^3/3!+….]

```cpp
#include <iostream>

using namespace std;


int main()
{
    float x, sum, no_row;
    int i, n;
  cout << "Display the sum of the series [ 1+x+x^2/2!+x^3/3!+….]"<<endl;
    cout << " Input the value of x: ";
    cin >> x;
  cout << " Input number of terms: ";
cin    >>    n;
sum    =    1;
no_row = 1;
    for (i = 1; i < n; i++)
    {
        no_row = no_row * x / (float)i;
        sum = sum + no_row;
```

```
    }
    c o u t < < e n d l ;
  cout << " The sum is : " << sum << endl;
}
```

Output :

Display the sum of the series [1+x+x^2/2!+x^3/3!+....]

 Input the value of x: 6

 Input number of terms: 6

The sum is : 179.8

Write a program in C++ to find the sum of the series [x - x^3 + x^5 + ...].

```
#include <iostream>
#include <math.h>
using namespace std;

int main()
{
    float x, sum, ctr;
 int i, n, m, mm, nn = 0;
cout << " Display the sum of the series [ x - x^3 + x^5 + ......]"<<endl;
    cout << " Input the value of x: ";
    cin >> x;
 cout << " Input number of terms: ";
cin  >>  n;
sum  =  x;
m = -1;
    cout << "The values of series:" << endl;
```

```cpp
    cout << sum << endl;

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

            ctr = (2 * i + 1);

            mm = pow(x , ctr);

            nn = mm * m;

            cout << nn << endl;

            sum = sum + nn;

            m = m * (-1);

        }

    cout << "The sum of the series upto " << n << " term is: " << sum << endl;

}
```

Output :

Display the sum of the series [x - x^3 + x^5 + ...]

Input the value of x: 5

Input number of terms: 5

The values of series:

5

-125

3125

-78125

1953125

The sum of the series upto 5 term is: 1.878e+006

Write a program in C++ to find the number and sum of all integers between 100 and 200 which are divisible by 9.

```cpp
#include <iostream>

using namespace std;
```

```cpp
int main()
{
    int i, sum = 0;

    cout << "Find the number and sum of all integer between 100 and 200, divisible by 9:" <<endl;
    cout << "Numbers between 100 and 200, divisible by 9: " << endl;

    for (i = 101; i < 200; i++)
    {
        if (i % 9 == 0)
        {
            cout << " " << i;

            sum += i;
        }
    }
    cout << endl;
    cout << " The sum : " << sum << endl;
}
```

Output :

Find the number and sum of all integer between 100 and 200, divisible by 9:

Numbers between 100 and 200, divisible by 9:

108 117 126 135 144 153 162 171 180 189 198

The sum : 1683

Write a program in C++ to find the LCM of any two numbers using HCF.

#include <iostream>

```cpp
using namespace std;

int main()
{
    int i, n1, n2, j, hcf = 1, lcm;
    cout << " LCM of two numbers: "<<endl;
    cout << " Input 1st number for LCM: ";
    cin >> n1;
    cout << " Input 2nd number for LCM: ";
    cin >> n2;
    j = (n1 < n2) ? n1 : n2;
    for (i = 1; i <= j; i++)
    {

        if (n1 % i == 0 && n2 % i == 0)
        {
            hcf = i;
        }
    }
    lcm = (n1 * n2) / hcf;
    cout << " The LCM of " << n1 << " and " << n2 << " is: " << lcm << endl;
}
```

Output :

LCM of two numbers:

Input 1st number for LCM: 4

Input 2nd number for LCM: 6

The LCM of 4 and 6 is: 12

Write a program in C++ to check whether a number can be expressed as the sum of two.

```cpp
#include <iostream>

using namespace std;

int main()

{

    int n, i, flg1 = 1, flg2 = 1, flg3 = 0, j;

 float sum = 0;

cout << " Check Whether a Number can be Express as Sum of Two Prime Numbers:" <<endl;

    cout << " Input a positive integer: ";

    cin >> n;

    for (i = 2; i <= n / 2; i++)

    {

       flg1  =  1;  flg2  =  1;

       for (j = 2; j < i; j++)

       {


          if (i % j == 0)

          {

             flg1 = 0;

             j = i;

          }

       }

    }
```

```cpp
      for (j = 2; j < n - i; j++)

      {

        if ((n - i) % j == 0)

        {

          flg2 = 0;

          j = n - i;

        }

      }

      if ( flg1 == 1 && flg2 == 1 )

      {

        cout << n << " = " << i << " + " << n - i << endl;

        flg3 = 1;

      }

    }

    if ( flg3 == 0 )

    {

      cout << n << " can not be expressed as sum of two prime numbers." << endl;

    }

}
```

Output :

Check Whether a Number can be Express as Sum of Two Prime Numbers:

Input a positive integer: 6

6 = 3 + 3

Write a program in C++ to find the first and last digits of a number

```cpp
#include <iostream>
```

```cpp
using namespace std;

int main()

{

    int n,first,last;

    cout << " Find the first and last digit of a number : "<<endl;

    cout << " Input any number: ";

        cin >> n; first = n; last=n % 10; for(first=n ; first>=10

        ; first=first/10 ); cout<<" The first digit of "<<n<<"

        is: "<<first<<endl; cout<<" The last digit of "<<n<<"

        is: "<<last<<endl;
```

} Output : Find the first and last digit of a number : Input any number: 456 The first digit of 456 is: 4 The last digit of 456 is: 6 **Write a program in C++ to find the sum of the first and last digits of a number.** #include <iostream> using namespace std;

```cpp
int main()

{

    int n,first,last,sum;
```

```cpp
cout << " Find the sum of first and last digit of a number: "<<endl;
cout << " Input any number: ";
cin >> n; first = n; last=n % 10; for( first=n ; first>=10 ; first=first/10 );
cout<<" The first digit of "<<n<<" is: "<<first<<endl; cout<<" The last digit
of "<<n<<" is: "<<last<<endl; cout<<" The sum of first and last digit of "
<<n<<" is: "<<first+last<<endl;



}
```

Output :

```
 Find the sum of first and last digit of a number:

 Input any number: 456

The first digit of 456 is: 4

The last digit of 456 is: 6

The sum of first and last digit of 456 is: 10
```

Write a program in C++ to calculate the product of the digits of any number.

```cpp
#include <iostream>
using namespace std;
int main()
{
    int num1, num2, r, pro=1,i;
 cout << " Find the product of digits of a given number: "<<endl;
cout << " Input a number: ";
cin >> num1;
```

```cpp
  num2 = num1;

for(i=num1;i>0;i=i/10)

  {

    r = i % 10;

    pro = pro*r;

  }

cout << " The product of digits of " << num2 << " is: " << pro << endl;

}
```

Output :

```
Find the product of digits of a given number:

Input a number: 456

The product of digits of 456 is: 120
```

Write a program in C++ to find the frequency of each digit in a given integer.

```cpp
#include <iostream>

using namespace std;

int main()

{

  int n, i, j, ctr, r;

  cout << " Find frequency of each digit in a given integer: "<<endl;

cout << " Input any number: ";

  cin >> n;

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

  {

    cout << "The frequency of " << i << " = ";

    ctr = 0;
```

```cpp
    for (j = n; j > 0; j = j / 10)

    {

        r = j % 10;

        if (r == i)

        {

            ctr++;

        }

    }

    cout << ctr << endl;

    }

}
```

O u t p u t   :

 Find frequency of each digit in a given integer:

 Input any number: 45678

The frequency of 0 = 0

The frequency of 1 = 0

The frequency of 2 = 0

The frequency of 3 = 0

The frequency of 4 = 1

The frequency of 5 = 1

The frequency of 6 = 1

The frequency of 7 = 1

The frequency of 8 = 1

The frequency of 9 = 0

Write a program in C++ to input any number and print it in words.

```cpp
#include <iostream>

using namespace std;

int main()

{

    int n, num = 0, i;

 cout << " Print a number in words:"<<endl;

cout << " Input any number: ";

    cin >> n;

 while (n != 0)

  {

     num = (num * 10) + (n % 10);

     n /= 10;

  }

 for (i = num; i > 0; i = i / 10)

   {



     switch (i % 10)

     {

     case 0:

        cout << "Zero ";

        break;

     case 1:

        cout << "One ";

        break;

     case 2:
```

```cpp
        cout << "Two ";

        break;

    case 3:

        cout << "Three ";

        break;

    case 4:

        cout << "Four ";

        break;

    case 5:

        cout << "Five ";

        break;

    case 6:

        cout << "Six ";

        break;

    case 7:

        cout << "Seven ";

        break;

    case 8:

        cout << "Eight ";

        break;

    case 9:

        cout << "Nine ";

        break;

    }

}
```

```cpp
    cout << endl;

}
```

Output :

 Print a number in words:

 Input any number: 692004 Six Nine Two Zero Zero Four **Write a C++ program that prints all ASCII characters with their values.** #include <iostream> using namespace std; int main() {

```cpp
    int sn, en, i, j, ctr, r;

cout << " Print ASCII character with their values: "<<endl;

    cout << " Input the starting value for ASCII characters: ";

    cin >> sn;

    cout << " Input the ending value for ASCII characters: ";

    cin >> en;

    if (sn>255 || sn<0)

    sn=1;

    if(en<0 || en>255)

    en=255;

    cout << "The ASCII characters:"<<endl ;

    for (i = sn; i <=en; i++)

    {

        cout << i<<" --> "<<char(i)<<endl;
```

```
  }
}
```

 Print ASCII character with their values:

 Input the starting value for ASCII characters: 65

Input the ending value for ASCII characters: 68

The ASCII characters:

65 --> A

66 --> B

67 --> C

68 --> D

Write a program in C++ to find the power of any number using a for loop.

```cpp
#include <iostream>

using namespace std;

int main()

{

    int bs, ex, num=1,i;

 cout << " Find power of any number using for loop:"<<endl;

    cout << " Input the base: ";

    cin >> bs;

    cout << " Input the exponent: ";

    cin>>ex;

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

    {

       num=num*bs;
```

```
  }
  c o u t   < < b s < < "   ^   " < < e x < < "   =   " < < n u m < < e r
}
```

Output :

Find power of any number using for loop:

Input the base: 6

Input the exponent: 4

6 ^ 4 = 1296

Write a program in C++ to enter any number and print all factors of the number.

```cpp
#include <iostream>

using namespace std;

int main()

{

  int num, i;

 cout << " Print all factors of a number:"<<endl;

cout << " Input a number: ";

cin >> num;

  cout << "The factors are: ";

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

  {

    if (num % i == 0)

    {

      cout << i << " ";

    }

  }
```

```cpp
    cout << endl;

}
```

Output :

```
 Print all factors of a number:

 Input a number: 6

The factors are: 1 2 3 6
```

Write a program in C++ to calculate the sum of the series 1.2+2.3+3.4+4.5+5.6+.......

```cpp
#include <iostream>

using namespace std;

int main()

{

   int trm;

 double num, sum, i, m;

cout << " Calculate the sum of the series 1.2+2.3+3.4+4.5+5.6+......:"<<endl;

cout << " Input the last integer between 1 to 98 without fraction you want to add: ";

cin >> trm;

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

   {

      if (i < 9)

      {

        m = .1;

      }

      e  l  s  e

      {

        m = .01;
```

```
        }

        num  =  i  +  ( ( i  +  1 )  *  ( m ) ) ;

        sum  =  sum  +  num ;

        cout  < <  num ;

        if  ( i  <  trm )

        {

            cout << " + ";

        }

    }

    cout << "\n The sum of the series =" << sum << endl;

}
```

Output :

Calculate the sum of the series 1.2+2.3+3.4+4.5+5.6+......:

Input the last integer between 1 to 98 without fraction you want to add: 6

1.2 + 2.3 + 3.4 + 4.5 + 5.6 + 6.7

The sum of the series =23.7

Write a program that will print the first N numbers for a specific base.

```
#include <iostream>

using namespace std;

int main()

{

    int trm, bs, r, q, i, num;

    cout << "\n\n Print the first N numbers for a specific base:\n";

    cout << " The number 11 in base 10 = 1*(10^1)+1*(10^0)=11" << endl;

    cout << " Similarly the number 11 in base 7 = 1*(7^1)+1*(7^0)=8" << endl;
```

```cpp
    cout << " Input the number of term: ";
cin >> trm;
    cout << " Input the base: ";
    cin >> bs;
cout << " The numbers in base " << bs << " are: " << endl;
for (i = 1; i <= trm; i++)
    {
        r = i % bs;
        q = i / bs;
        num = q * 10 + r;
        cout << num << " ";
    }
    cout << endl;
}
```

Output :

Print the first N numbers for a specific base:

The number 11 in base 10 = 1*(10^1)+1*(10^0)=11

Similarly the number 11 in base 7 = 1*(7^1)+1*(7^0)=8

Input the number of term: 6

Input the base: 4

The numbers in base 4 are:

1 2 3 10 11 12