

Tasks

1-Write a program in C++ that takes a number as input and prints its multiplication table up to 10.

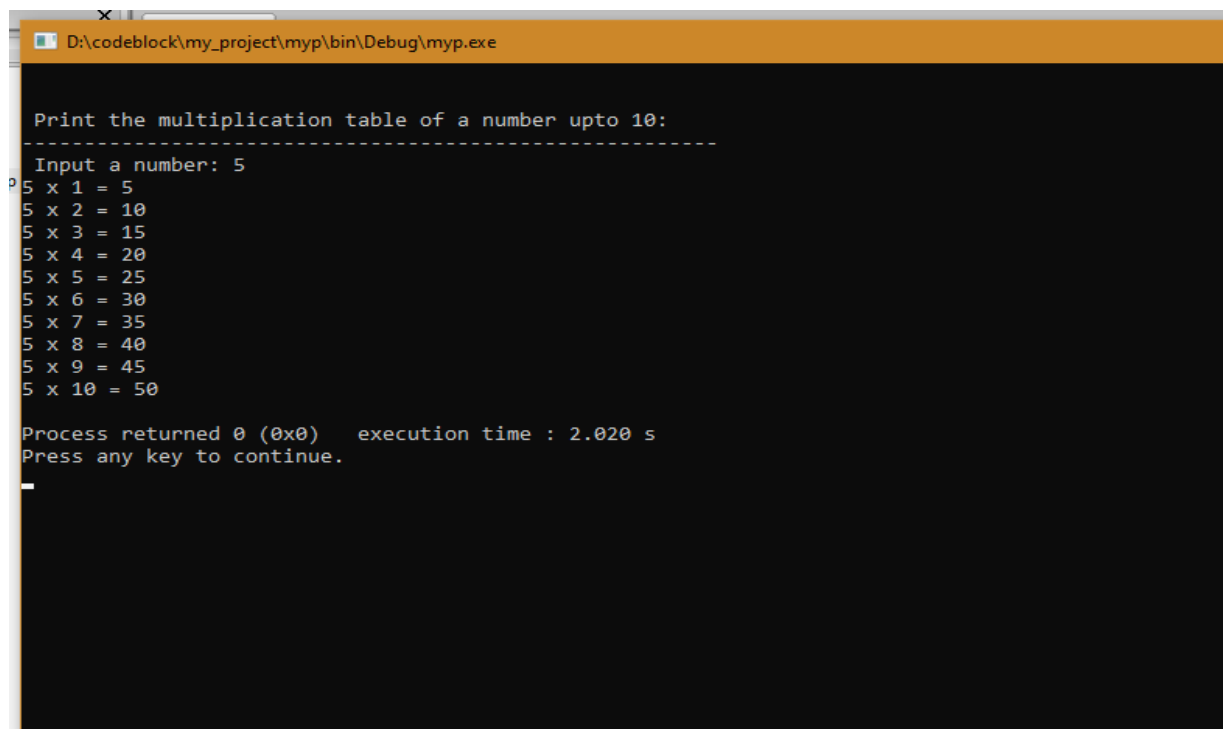
```
#include <iostream>

using namespace std;

int main()
{
    int a,i=0;
    cout << "\n\n Print the multiplication table of a number upto 10:\n";
    cout << "-----\n";
    cout << " Input a number: ";
    cin>> a;
    for (i=1;i<=10;i++)
    {
        cout << a<<" x " << i << " = "<<a*i<<"\n" ;
    }

    return 0;
}
```

Output:



The screenshot shows a Windows command prompt window with the title "D:\codeblock\my_project\myp\bin\Debug\myp.exe". The program's output is displayed in a black terminal window. It prompts the user to "Print the multiplication table of a number upto 10:" and shows a dashed line separator. The user has entered "5" as the input number. The program then prints the multiplication table for 5, from 5 x 1 to 5 x 10. At the bottom, it shows "Process returned 0 (0x0) execution time : 2.020 s" and "Press any key to continue.".

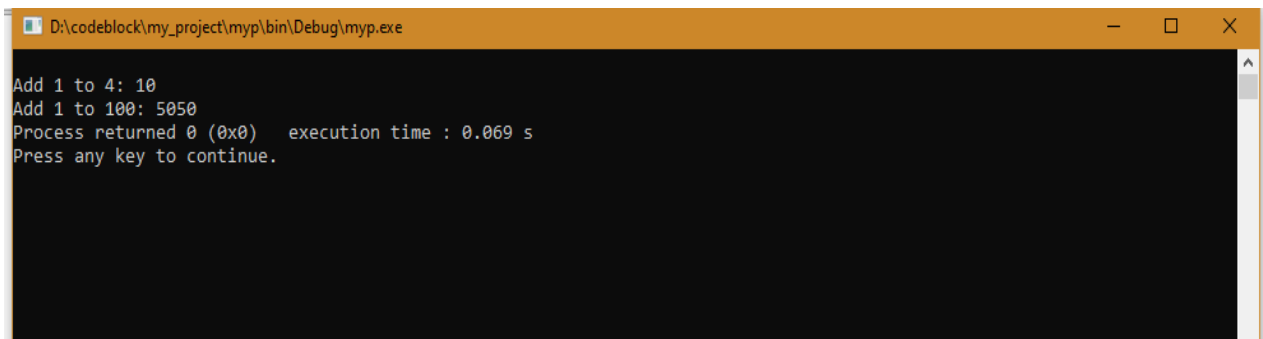
```
Print the multiplication table of a number upto 10:
-----
Input a number: 5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50

Process returned 0 (0x0) execution time : 2.020 s
Press any key to continue.
```

2- Write a C++ program to add all the numbers from 1 to a given number.

```
int Add_1_to_given_number(int n) {  
    int total = 0;  
    for (int x = 1; x <= n; x++)  
    {  
        total += x;  
    }  
    return total;  
}  
  
int main() {  
    cout << "\nAdd 1 to 4: " << Add_1_to_given_number(4);  
    cout << "\nAdd 1 to 100: " << Add_1_to_given_number(100);  
    return 0;  
}
```

Output:



The screenshot shows a window titled "D:\codeblock\my_project\myp\bin\Debug\myp.exe". The output text is as follows:

```
Add 1 to 4: 10  
Add 1 to 100: 5050  
Process returned 0 (0x0)   execution time : 0.069 s  
Press any key to continue.
```

3- Write a program in C++ to check whether a number is prime or not.

A **prime** number is a positive integer with only two factors : itself and one

$\begin{array}{r} 2 \overline{) 2} \\ 1 \end{array}$	$2 = 2 \times 1$ Factors : 1, 2 two factors only
Prime Number	
$\begin{array}{r} 2 \overline{) 6} \\ 3 \overline{) 3} \\ 1 \end{array}$	$6 = 2 \times 3 \times 1$ Factors : 1, 2, 3 more than two factors
Not a Prime Number	
$\begin{array}{r} 2 \overline{) 12} \\ 2 \overline{) 6} \\ 3 \overline{) 3} \\ 1 \end{array}$	$12 = 2 \times 2 \times 3 \times 1$ Factors : 1, 2, 3, 4, 6, 12 more than two factors
Not a Prime Number	

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```

int main() {

    int num1, ctr = 0;
    cout << "\n\n Check whether a number is prime or not:\n";
    cout << "-----\n";
    cout << " Input a number to check prime or not: ";
    cin>> num1;
    for (int a = 1; a <= num1; a++)
    {
        if (num1 % a == 0)
        {
            ctr++;
        }
    }
    if (ctr == 2)
    {
        cout << " The entered number is a prime number. \n";
    }
    else {
        cout << " The number you entered is not a prime number. \n";
    }
}

```

output:

```

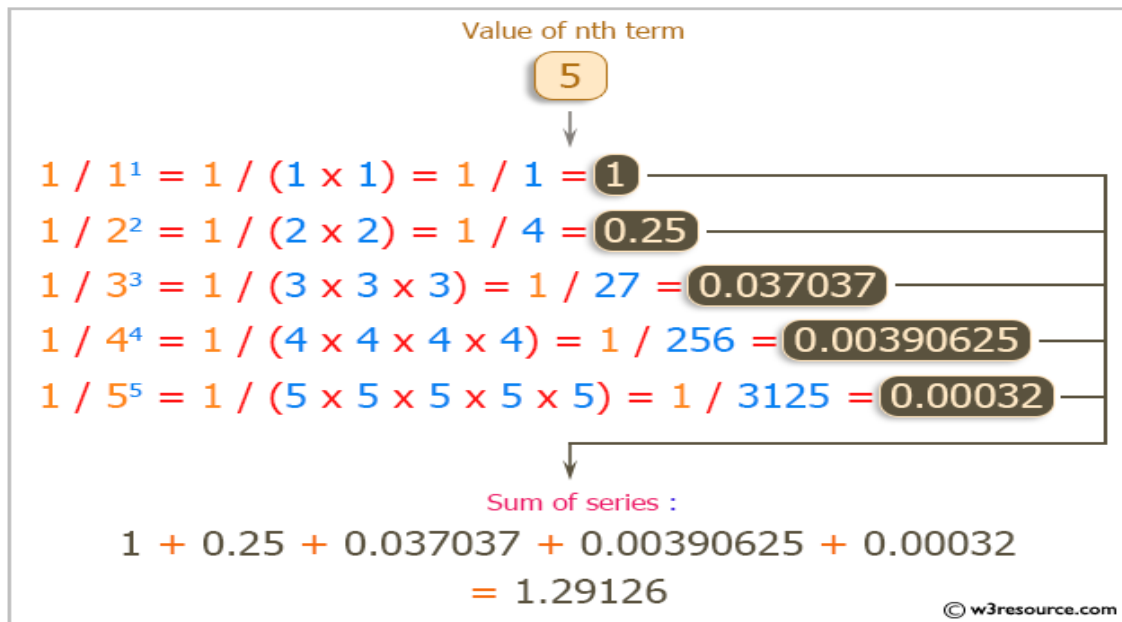
D:\codeblock\my_project\myp\bin\Debug\myp.exe

Check whether a number is prime or not:
-----
Input a number to check prime or not: 6
The number you entered is not a prime number.

Process returned 0 (0x0)   execution time : 4.991 s
Press any key to continue.

```

4- Write a program in C++ to find the sum of the series $1 + 1/2^2 + 1/3^3 + \dots + 1/n^n$.



```
#include <cmath>

using namespace std;

int main()
{
    double sum = 0, a;
    int n, i;
    cout << "\n\n Find the sum of the series 1 + 1/2^2 + 1/3^3 +.....+ 1/n^n:\n";
    cout << "-----\n";
    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;
    }
    cout << " The sum of the above series is: " << sum << endl;

    return 0;
}
```

D:\codeblock\my_project\kk\bin\Debug\kk.exe

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

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

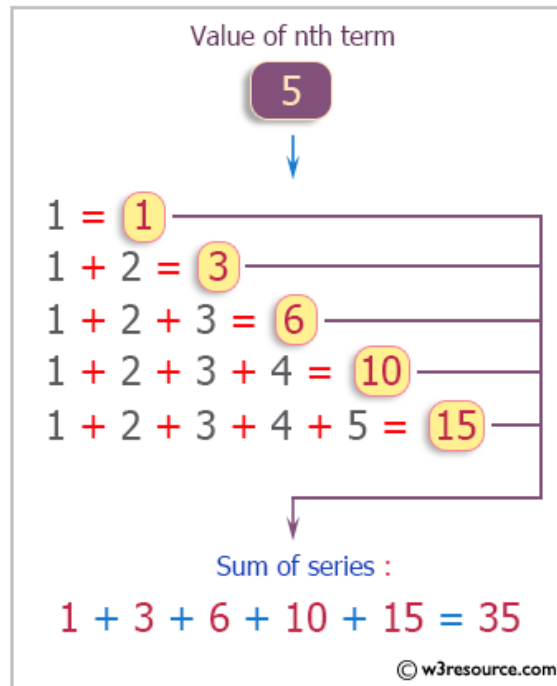
1/6^6 = 2.14335e-005

The sum of the above series is: 1.29128

Process returned 0 (0x0) execution time : 5.263 s

Press any key to continue.

5- Write a program in C++ to calculate the series $(1) + (1+2) + (1+2+3) + (1+2+3+4) + \dots + (1+2+3+4+\dots+n)$.



```
nt 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):\n";
cout << "-----\n";
cout << " Input the value for nth term: ";
cin >> n;
for (i = 1; i <= n; i++)
{
    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;

return 0;
```

```
D:\codeblock\my_project\kk\bin\Debug\kk.exe

Find the sum of the series (1) + (1+2) + (1+2+3) + (1+2+3+4) + ...
-----
Input the value for nth term: 10
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
1+2+3+4+5+6+7 = 28
1+2+3+4+5+6+7+8 = 36
1+2+3+4+5+6+7+8+9 = 45
1+2+3+4+5+6+7+8+9+10 = 55
The sum of the above series is: 220

Process returned 0 (0x0)   execution time : 7.756 s
Press any key to continue.
```

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

Specified number of characters

4

Square pattern

```
# # # #  
# # # #  
# # # #  
# # # #
```

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```
#include <iostream>  
#include <cmath>  
  
using namespace std;  
  
int main()  
{  
  
    int size;  
    cout << "\n\n Print a pattern like square with # character:\n";  
    cout << "-----\n";  
    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;  
}
```

D:\codeblock\my_project\kk\bin\Debug\kk.exe

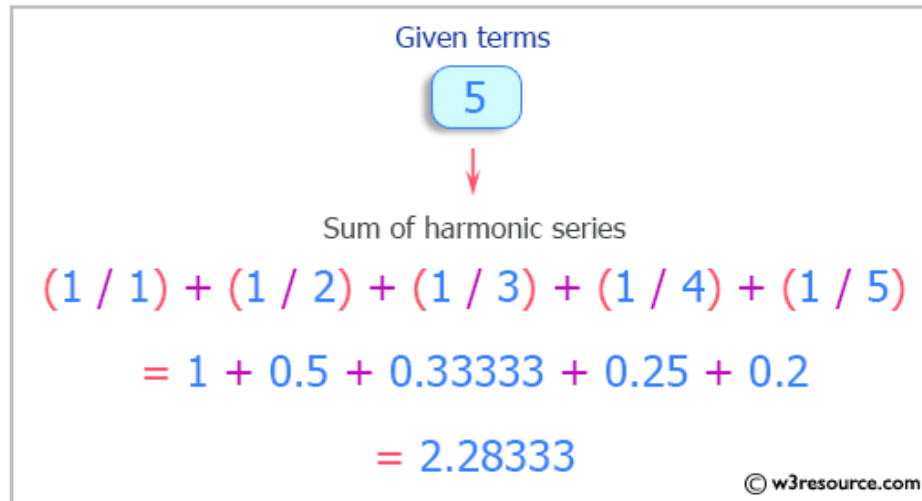
Print a pattern like square with # character:

Input the number of characters for a side: 10

```
# # # # # # # #  
# # # # # # # #  
# # # # # # # #  
# # # # # # # #  
# # # # # # # #  
# # # # # # # #  
# # # # # # # #  
# # # # # # # #  
# # # # # # # #  
# # # # # # # #
```

Process returned 0 (0x0) execution time : 1.532 s
Press any key to continue.

7- Write a program in C++ to display the n terms of harmonic series and their sum. $1 + 1/2 + 1/3 + 1/4 + 1/5 \dots 1/n$ terms?



```
int i, n;
float s = 0.0;
cout << "\n\n Display n terms of harmonic series and their sum:\n";
cout << " The harmonic series: 1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms\n";
cout << "-----\n";
cout << " Input number of terms: ";
cin >> n;
for (i = 1; i <= n; i++)
{
    if (i < n)
    {
        cout << "1/" << i << " + ";
        s += 1 / (float)i;
    }
    if (i == n)
    {
        cout << "1/" << i;
        s += 1 / (float)i;
    }
}
cout << "\n The sum of the series up to " << n << " terms: " << s << endl;
```

D:\codeblock\my_project\kk\bin\Debug\kk.exe

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: 5
1/1 + 1/2 + 1/3 + 1/4 + 1/5
The sum of the series up to 5 terms: 2.28333
Process returned 0 (0x0) execution time : 3.372 s

8- Write a program in C++ to find the number and sum of all integer between 100 and 200 which are divisible by 9?

... 101 108 ... 117, 126, 135, 144, 153, 162, 171, 180, 189, 198

↓ ↓

9) 101 (11 9) 108 (12

9 9

11 18

9 18

2 0

Not divisible by 9 Divisible by 9

↓

108 + 117 + 126 + 135 + 144 + 153 + 162 + 171 + 180 + 189 + 198

= 1683

This numbers are also divisible by 9

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```
#include <iostream>
#include <cmath>

using namespace std;

int main()
{
    int i, sum = 0;
    cout << "\n\n Find the number and sum of all integer between 100 and 200, divisible by 9:\n";
    cout << "-----\n";
    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 << "\n The sum : " << sum << endl;

    return 0;
}
```

Output:

```
D:\codeblock\my_project\kk\bin\Debug\kk.exe

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

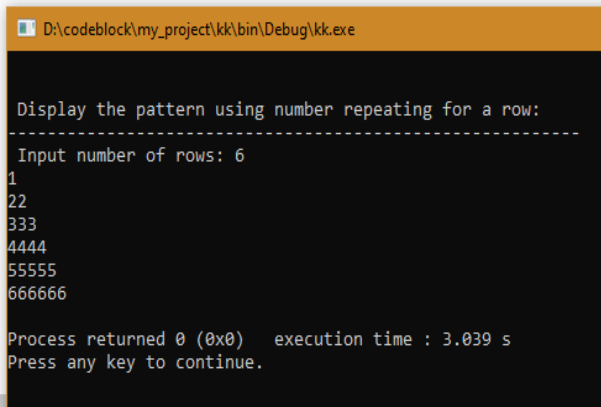
Process returned 0 (0x0)   execution time : 0.033 s
Press any key to continue.
```


9- Write a program in C++ to make such a pattern like right angle triangle using number which will repeat the number for that row?

```
#include <iostream>
#include <cmath>

using namespace std;

int main()
{
    int i,j,rows;
    cout << "\n\n Display the pattern using number repeating for a row:\n";
    cout << "-----\n";
    cout << " Input number of rows: ";
    cin >> rows;
    for(i=1;i<=rows;i++)
    {
        for(j=1;j<=i;j++)
            cout<<i;
        cout<<endl;
    }
    return 0;
}
```




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

```
#include <iostream>
#include <cmath>

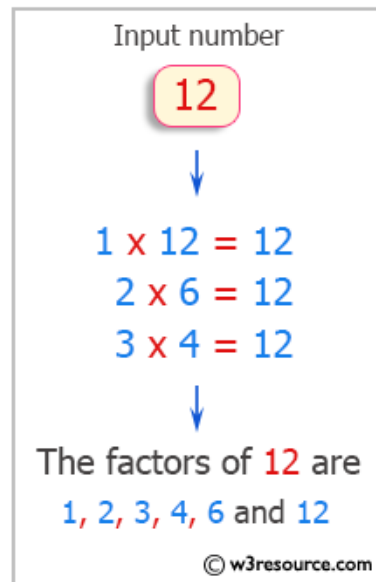
using namespace std;

int main()
{
    int bs, ex, num=1,i;
    cout << "\n\n Find power of any number using for loop:\n";
    cout << "-----\n";
    cout << " Input the base: ";
    cin >> bs;
    cout << " Input the exponent: ";
    cin >> ex;

    for (i = 1; i <=ex; i++)
    {
        num=num*bs;
    }
    cout <<bs<<" ^ "<<ex<<" = "<<num<<endl ;
    return 0;
}
```



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



```
#include <iostream>
#include <cmath>

using namespace std;

int main()
{
    int num, i;
    cout << "\n\n Print all factors of a number:\n";
    cout << "-----\n";
    cout << " Input a number: ";
    cin >> num;
    cout << "The factors are: ";
    for (i = 1; i <= num; i++)
    {
        if (num % i == 0)
        {
            cout << i << " ";
        }
    }
    cout << endl;
    return 0;
}
```

```
D:\codeblock\my_project\kk\bin\Debug\kk.exe

Print all factors of a number:
-----
Input a number: 10
The factors are: 1 2 5 10

Process returned 0 (0x0)   execution time : 3.791 s
Press any key to continue.
```

