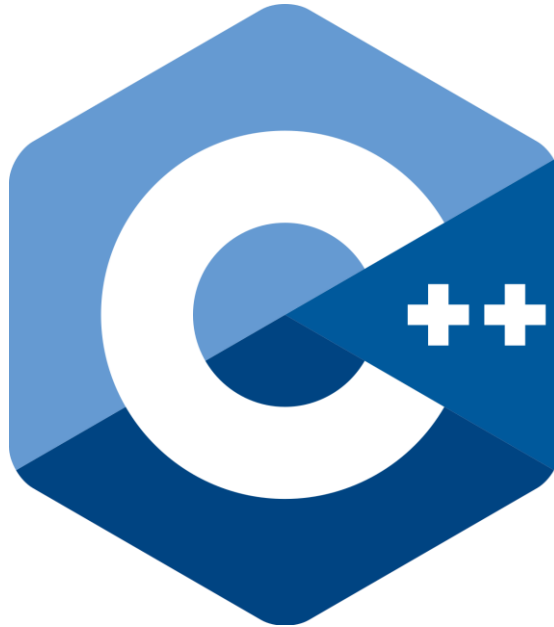




# **Fundamentals of Programming in C++**



# Where to Practice ?



<https://www.hackerrank.com/>

The screenshot shows the HackerRank website interface. At the top, there's a navigation bar with the HackerRank logo, a 'Login' button, and a 'Sign Up' button. Below this is a blue banner with the text 'Overcome Remote Hiring Challenges with Virtual Whiteboarding.' and a 'Register now' button. The main content area is divided into two columns. The left column is titled 'For Companies' and features the text 'Matching developers with great companies.' and a green button labeled 'Start Remote Hiring'. The right column is titled 'For Developers' and features the text 'Join over 7 million developers, practice coding skills, prepare for interviews, and get hired.' and a green button labeled 'Sign Up & Code'. To the right of the text, there's an illustration of seven diverse people standing in a row, with dashed lines connecting them to logos of companies like Stripe, Airbnb, LinkedIn, and Dropbox. At the bottom, there's a footer with copyright information and a privacy policy link.

HackerRank

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We are the market-leading technical interview platform to identify and hire developers with the right skills.

**Start Remote Hiring**

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Join over 7 million developers, practice coding skills, prepare for interviews, and get hired.

**Sign Up & Code**















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# Where to Practice ?

## Skills Available For Practice

 Algorithms	 Data Structures	 Mathematics
 C	 C++	 Java
 Python	 Ruby	 Linux Shell
 Functional Programming	 Artificial Intelligence	 SQL
 Databases	 Regex	



<https://www.hackerrank.com/domains/cpp>

Solve C++ | HackerRank

hackerrank.com/domains/cpp

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HackerRank

PRACTICE

COMPETE

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LEADERBOARD

Search

Hiring developers?

Log In

Sign Up

Practice > C++

C++

Say "Hello, World!" With C++

Easy, Max Score: 5, Success Rate: 98.63%

Solve Challenge

Input and Output

Easy, Max Score: 5, Success Rate: 93.93%

Solve Challenge

Basic Data Types

Easy, Max Score: 10, Success Rate: 79.53%

Solve Challenge

Conditional Statements

Easy, Max Score: 10, Success Rate: 97.02%

Solve Challenge

For Loop

Easy, Max Score: 10, Success Rate: 93.91%

Solve Challenge

STATUS

☐ Solved

☐ Unsolved

DIFFICULTY

☐ Easy

☐ Medium

☐ Hard

SUBDOMAINS

☐ Introduction

☐ Strings

☐ Classes

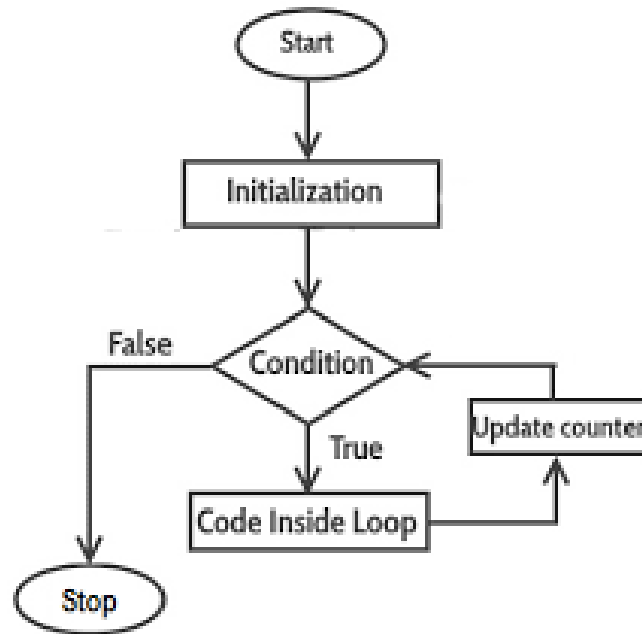
☐ STL

☐ Inheritance

☐ Debugging

☐ Other Concepts

# Loops



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

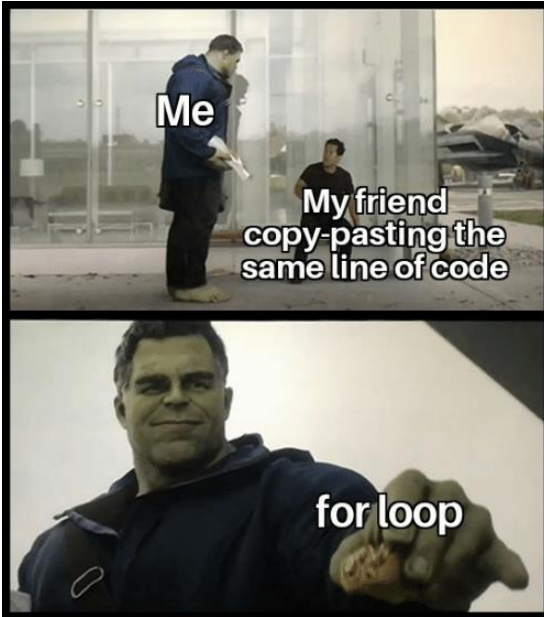
int main()
{
    cout << "I love Programming <3 \n";
    cout << "I love Programming <3 \n";
    cout << "I love Programming <3 \n";
    cout << "I love Programming <3 \n";
    cout << "I love Programming <3 \n";
    cout << "I love Programming <3 \n";
}
```



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

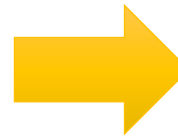
int main()
{
    while (1)
    {
        cout << "I love Programming <3 \n";
    }
}
```

# For loop



```
for (initialization expr; test expr; update expr)
{
    // body of the loop
    // statements to execute
}
```

```
for (int i = 0; i < 5; i++)
{
    cout << i << '\n';
}
```



0  
1  
2  
3  
4

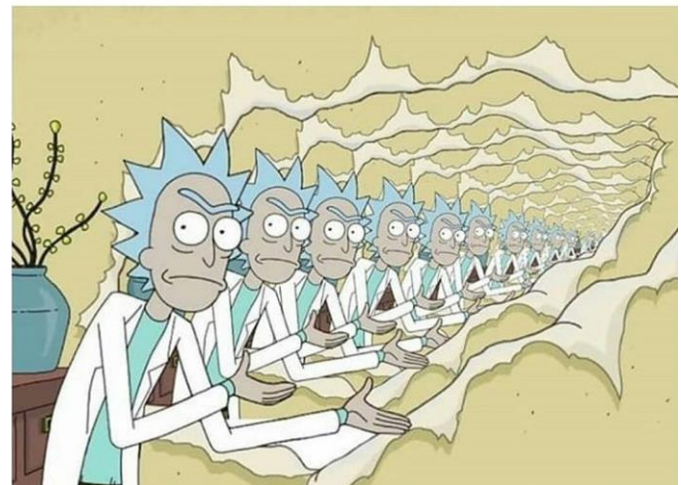
# While loop

```
initialization expression;  
while (test_expression)  
{  
    // statements  
  
    update_expression;  
}
```

```
int T = 6;  
while (T)  
{  
    cout << T << '\n';  
    T--;  
}
```



When you forget to break out of the while loop



# do while loop

```
initialization expression;  
do  
{  
    // statements  
  
    update_expression;  
} while (test_expression);
```



```
int i = 3;  
do  
{  
    cout << "Hey !!\n";  
    i++;  
} while (i < 3);
```



# Lets Print this pattern

```
01 02 03 04 05 06 07 08 09 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50
```

```
01 02 03 04 05 06 07 08 09 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50
```

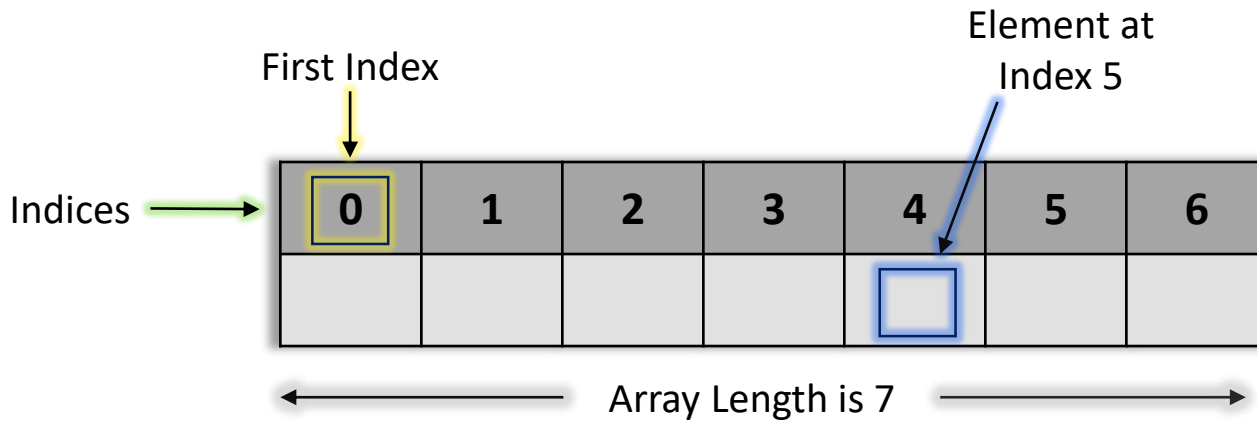
```
int count = 1;
while (count <= 50)
{
    if (count < 10)
    {
        cout << "0" << count << ' ';
    }
    else
    {
        cout << count << ' ';
    }

    if (count % 10 == 0)
    {
        cout << '\n';
    }

    ++count;
}
```

# Arrays

A data structure that contains a group of elements of the same type



# Initialize Arrays

```
float arrFloat[] = {10.56, 4.6, 3.3, 7.8};
```

```
int arr1[10];
```

```
int n = 10;  
int arr2[n];
```

```
int arr[5];  
arr[0] = 5;  
arr[1] = 3;  
arr[2] = 65;  
arr[3] = 467;  
arr[4] = -98;
```

# Accessing Elements of an Array

```
int n;  
cin >> n;  
int arr[n];  
for (int i = 0; i < n; i++)  
{  
    cin >> arr[i];  
}
```

```
for (int i = 0; i < 5; i++)  
{  
    cout << arr[i] << " ";  
}
```

# Multidimensional Array

1D Array

3	2
---	---

2D Array

1	0	1
3	4	1

3D Array

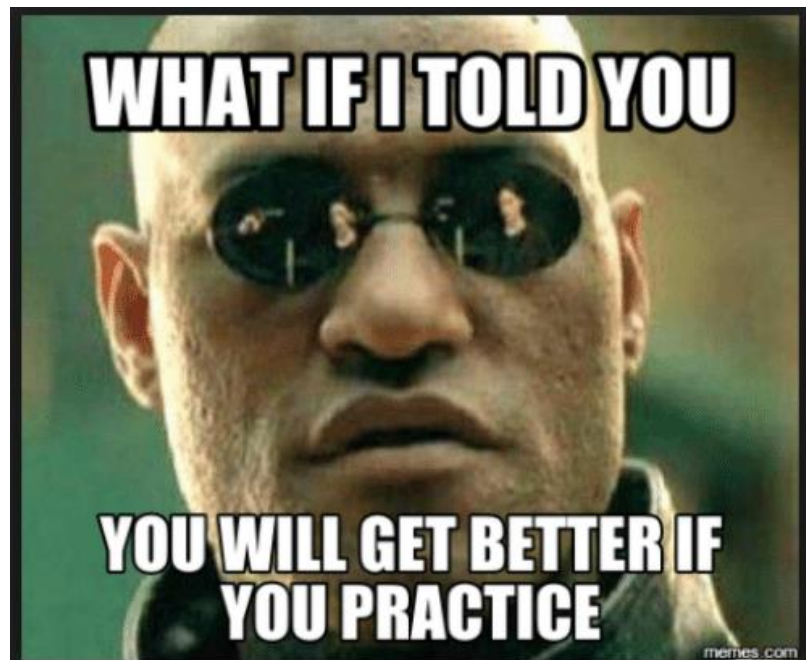
1	7	9
5	9	3
7	9	9

```
int arr_1d[2];  
int arr_2d[2][3];  
int arr_3d[3][3][2];
```

# 2D Array

```
int arr[3][2] = {{1, 2}, {3, 4}, {5, 6}};
```

```
for (int i = 0; i < 3; i++)  
{  
    for (int j = 0; j < 2; j++)  
    {  
        cout << arr[i][j] << " ";  
    }  
    cout << '\n';  
}
```



Write a code to print *this* pattern ->

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```



## Make a Calculator

Take two numbers and  
a mathematical operator as input.  
print the output of the arithmetic operation.

Given the size of an array and its elements,  
write a function to get its maximum element.

## Matrix Addition

Take the dimensions  $m \times n$  and the elements of two 2D arrays as input from the user and print the resultant array of the matrix addition.