

# 1. What is C++?

As an extension of the C language, C++ was developed by Bjarne Stroustrup as a general purpose cross-platform language which gives programmers a high level of control over system resources and memory.

## 2. What is namespace in C++?

If there are two or more functions with the same name defined in different libraries then how will the compiler know which one to refer to? Thus namespace came to picture. A namespace defines a scope and differentiates functions, classes, variables etc. with the same name available in different libraries. The namespace starts with the keyword "namespace". The syntax for the same is as follows:

```
1 namespace namespace_name {  
2     // code declarations  
3 }
```

## 3. How to input string in C++?

There are three ways to input a string, using cin, get, and getline. All three methods are mentioned in the sample program below.

```
#include <iostream>  
1 using namespace std;  
2  
3 int main()  
4 {  
5     char s[10];  
6  
7     cout << "Enter a string: ";  
8     cin >> str;  
9 }
```

```
10     cout << "\nEnter another string: ";
11     cin.get(s, 10);
12
13     getline(cin, str);
14
15     return 0;
16 }
17
```

## 4. What is operator overloading in C++?

An overloaded declaration is a declaration in the same scope of function or operator declared with the same name more than once.

## 5. How to learn C++?

C++ is a programming language which is an extension of C. Thus, one should prefer to learn C first (it's not necessary). After learning C, then understand the basic difference between C and C++. Implement all the basic programs you learnt in C in C++ also. Then dive into the OOPs concept of C++. Do as many hands-on as possible to understand basic OOPs, and then dive into advanced level OOPs. When all the basics are clear, build a small game to understand the structure and remain concepts if any. By following all these steps one can learn C++.

## 6. What is the difference between C and C++?

The difference between c and c++ is that C++ is a object oriented language, which means that it has all the features of C as well as its own thing that is the concept of OOP. C++ has many functionalities of OOP that

are missing from C such as encapsulation, abstraction, classes, objects, etc.

## 7. How to reverse a string in C++?

To reverse a string, a sample code is mentioned below.

```
1
2#include<iostream>
3#include<string.h>
4using namespace std;
5int main ()
6{
7    char n[50], t;
8    int i, j;
9    cout << "Enter a string : ";
10   gets(n);
11   i = strlen(n) - 1;
12   for (j = 0; j < i; j++,i--)
13   {
14       t = s[j];
15       s[j] = s[i];
16       s[i] = t;
17   }
18   cout << "\nReverse string : " << s;
19   return 0;
```

## 8. What is template in C++?

A template in C++ is used to pass data types as parameters . These make it easier and more simpler to use classes and functions.

```
1template <typename T>
2
3    int fun (T a,T b)
4    {
5        return (a+b);
6    }
7
```

```
8         int main(){
9             cout<<fun<int>(11,22);
10        }
```

## 9. What is using namespace std in C++?

Using namespace std in C++ tells the compiler that you will be making use of the name space called 'std'. The 'std' namespace contains all the features of the standard library. You need to put this statement at the start of all your C++ codes if you don't want to keep on writing std:: in front of every variable/string or whatever standard library feature you are making use of, as it becomes tedious to do so.

## 10. How to download turbo C++ for windows 10?

To download turbo c++ follow the steps mentioned below:

Step-1: Download turbo C++ from

<http://www.turboc8.com/p/download.html>

Step-2: Extract Turbo.C.3.2.zip file.

Step-3: Run setup.exe file.

Step-4: Follow the instructions mentioned.

## 11. How to paste in turbo C++?

Paste in turbo C++ can be done by two techniques:

1. Shift+Insert

2. Open the file in notepad with .cpp extension. Make the changes and save it. After saving the file, you can open it from the Turbo C++ application file menu from where you stored the cpp file.

## 12. What is pointer in C++?

Pointers in C++ are a data type that store the memory address of another variable.

For eg.

```
1 char *str = "Hi, How are you?";
2     Here the pointer variable *str points to the string "Hi, How are you?"
3
4     or
5
6     int age;
7     int *int_value;
8
9     *int_value = &age;
10
11    cout<<"Enter your age please:";
12    cin>>age;
13
14    cout<<"\n Your age is:"<<*int_value;
15
16    // this will print your age as the variable is pointing to the variable age.
```

## 13. What is function in C++?

A function in C++ is a block of code that can be referenced from anywhere in the system and that serves a specific purpose.

```
1 int fun(){
2     int a = 11;
3     return 11;
4 }
5
6 int main(){
7
8     int b = fun();
9 }
```

## 14. What is destructor in C++?

Destructors in c++ are special function/methods that are used to remove memory allocation for objects. They are called usually when the scope of an object ends. eg. when a function ends you can call a destructor. They are of the same name as the class – syntax – ~<classname>();

## 15. Who invented C++?

Bjarne Stroustrup invented C++ in 1985.

## 16. How to convert integer to string in C++?

There are 2 approaches to convert integer variables to string. Both the approaches with a sample code are mentioned below.

```
1 Approach-1
2 #include<iostream>
3 #include<string>
4 using namespace std;
5 void main()
6 {
7     int n= 1;
8     string s= to_string(n);
9     cout << s;
10 }
11
12 Approach-2
13
14 #include<iostream>
15 #include <sstream>
16 #include <string>
17 using namespace std;
18 int main()
19 {
20     int n = 17;
21     // declaring output string stream
22     ostringstream s1;
23
```

```

24 // Sending a number as a stream into output str
25 s<< n;
26 // the str() converts number into string
27 string fin = s.str();
28 // Displaying the string
29 cout << fin;
30 return 0;
31 }
32

```

## 17. What is function overloading in C++?

Function Overloading happens in C++ when two or more functions share the same name. They can be differentiated on the basis of the type of data they are passing as parameters or even the number of parameters they are passing. eg. `int fun(char a);` & `int fun(int b);` & `void fun(int a, int b)`

## 18. What is stl in C++?

Stl is the standard template library. It is a library that allows you to use a standard set of templates for things such as: Algorithms, functions, Iterators in place of actual code.

```

1 queue<int> Q;
2
3     for(k=0;k<10;k++)
4     {
5         Q.push(k);
6     }

```

## 19. How to run C++ program in cmd?

```

1 verify gcc installation using the command:
2     $ gcc -v
3
4 then go to your working directory or folder where your code is:
5     $ cd <folder_name>

```

```
6
7 then build the file containing your c code as such:
8     $ gcc main.cpp
9
10         or
11
12     $ g++ -o main main.cpp
13
14 then run the executable generated in your system:
15     $ main.exe
```

## 20. What is type casting in C++?

Type casting in C is used to change the data type. They are of two types: Implicit Type Conversion: It is automatic. Explicit Type Conversion: It is user-defined.

## 21. How to use string in C++?

A string is a sequence of characters. In C++, string is a data type as well as a header file. This header file consists of powerful functions of string manipulation. A variable of string is declared as follows:

```
1 string str= "Hello";
2
3 And to use string one needs to include the header file.
4
5 // Include the string library
6 #include <string>
7
8 // Create a string variable
9 string str= "Hello";
```

## 22. How to input string in C++ with spaces?

The code to input a string in C++ with spaces is as follows:



```

1
2#include <iostream>
3#include <string>
4using namespace std;
5
6int main()
7{
8    string s;
9
10    cout << "Enter the sentence";
11    getline(cin, s);
12    cout << str;
13    return 0;
14}

```

## 23. What is stream in C++?

Stream refers to a stream of characters to be transferred between program thread and i/o.

## 24. What is the difference between structure and class in C++?

The difference between structure and class is as follows:

- By default, the data members of class are private whereas data members of structure are public.
- While implementing inheritance, the access specifier for struct is public whereas for class its private.
- Structures do not have data hiding features whereas class does.
- Structures contain only data members whereas class contains data members as well as member functions.
- In structure, data members are not initialized with a value whereas in class, data members can be initialised.

– Structures are stored as stack in memory whereas class is stored as heap in memory.

## **25. How to clear screen in C++?**

One can clear screen using – `clrscr()` or `system("clear")`.

## **26. Who developed C++?**

Bjarne Stroustrup in 1998 at Bell Labs developed the language C++.

## **27. How to compile and run C program in notepad++ ?**

To compile and run c program in notepad++ follow the steps mentioned below:

Step-1: Download and install notepad++

Step-2: Download and install MinGw gcc along with gcc.

Step-3: Configure notepad++ for gcc. This step can be further divided into two sub-steps. A: Create C compiler tool in Notepad++

B: Creating C execution tool.

Step-4: Execute C program in Notepad++

## **28. How many keywords in C++ ?**

There are 95 reserved keywords in C++ which are not available for re-definition or overloading.

## 29. What is iostream in C++?

It is a header file that includes basic objects such as cin, cout, cerr, clog.

## 30. How to give space in C++?

In C++ programming, the space can be given using the following code.

```
cout << " ";
```

## 31. How to dynamically allocate a 2d array in C++ ?

There are several methods by which one can allocate memory to 2D array dynamically one of which is as follows.

```
1
2#include <iostream>
3int main()
4{
5    int row = 2, col = 2;
6    int* a = new int[row * col];
7
8    int i, j, count = 0;
9    for (i = 0; i < row; i++)
10        for (j = 0; j < col; j++)
11            *(a + i*col + j) = count++;
12
13    for (i = 0; i < row; i++)
14        for (j = 0; j < col; j++)
15            printf("%d ", *(a + i*col + j));
16
17    delete[ ] a;
18    return 0;
19}
```

## 32. How to use goto statement in C++ ?

Goto statement provided unconditional jump in the code. The syntax is:  
goto label;

```
1
2label: statement;
3
4#include <iostream>
5using namespace std;
6
7void main () {
8    float d, avg, add = 0.0;
9    int j, n;
10   cin >> n;
11
12   for(j = 1; j <= n; ++j)
13   {
14       cout << "Enter number" << i;
15       cin >> d;
16
17       if(d < 0.0)
18       {
19           goto jump;
20       }
21       add+= d;
22   }
23jump:
24   avg = add/ (j- 1);
25   cout << avg;
26 }
```

### 33. What is function overriding in C++ ?

When a function with same name is present in both parent and child class then it is called function overriding.

```
1#include <iostream>
2using namespace std;
3class parent {
4public:
5    void display(){
6        cout<<"Parent Class";
7    }
```

```

8};
9class child: public parent{
10public:
11    void display() {
12        cout<<"Child Class";
13    }
14};
15int main() {
16    child o = parent();
17    o.display();
18    return 0;
19}

```

## 34. Which operator cannot be overloaded in C++ ?

Some of the operators that cannot be overloaded are as follows:

- Dot operator- "."
- Scope resolution operator- "::"
- "sizeof" operator
- Pointer to member operator- ".\*"

## 35. How to copy and paste in turbo C++ ?

Press Ctrl + Insert to copy.

Press Shift + Insert to paste.

## 36. Why C++?

The use of C++ is varied such as:

- It is used in developing graphic user interface based applications like adobe photoshop.
- It is used in developing games as it overrides the complexity of 3D

games.

- There are many animated softwares developed in C++
- Most of the compilers are written in C++.
- Google Chrome, Mozilla Firefox etc. web browser are developed using C++

There are many more such uses that make C++ a desired language.

## 37. What is bool in C++?

Bool is a data type in C++ which takes two values- True and False. Syntax is as follows:

```
bool b1 = true;
```

A sample code is as follows:

```
1
2#include<iostream>
3using namespace std;
4int main()
5{
6    int a= 60, b= 70;
7    bool c, d;
8    c= a== b; // false
9
10   c= a< b; // true
11
12   cout <<b1;
13   cout << b2 ;
14   return 0;
15}
```

## 38. What is exception in C++ ?

Runtime abnormal conditions that occur in the program are called exceptions. These are of 2 types:

- Synchronous
- Asynchronous

C++ has 3 specific keywords for handling these exceptions:

- try
- catch
- throw

## 39. How to set decimal places in C++ ?

For limiting the decimal places in C++ there are five functions : floor(), ceil(), trunc(), round() and setprecision(). Out of these five, only setprecision() function is used for setting the decimal places to put as output. All the functions are mentioned in the following sample code.

```
1
2#include<bits/stdc++.h>
3using namespace std;
4
5int main()
6{
7    float a =2.33333;
8    cout << floor(a) << endl;
9    cout << ceil(a) << endl;
10   cout << trunc(a) << endl;
11   cout << round(a) << endl;
12   cout << setprecision(2) << a;
13   return 0;
```

## 40. How to get absolute value in C++?

In C++, there are three functions in the `cstdlib` header file to return the absolute value of the integer. Those are:

- `abs()`
- `labs()`
- `llabs()`

The syntax for all the functions is same – `function_name(integer value)`

The difference lies in the range for integer value being passed as an argument. For `abs()` its type `int` in C++. For `labs()`, its type `long int` in C++ and for `llabs()` its `long long int` in C++.

Sample code for the illustrating the three functions is as follows:

```
1
2#include <cstdlib>
3#include <iostream>
4
5using namespace std;
6
7int main()
8{
9    int a, b, c;
10
11    a = abs(22);
12    b= labs(1234355L);
13    c= llabs(1234863551LL);
14    cout << a;
15    cout << b;
16    cout<< c;
17    return 0;
18}
```

## 41. What is the difference between C++ and Java?

The difference between c++ and java are as follows:



- C++ supports goto statements whereas Java does not.
- C++ is majorly used in system programming whereas Java is majorly used in application programming.
- C++ supports multiple inheritance whereas Java does not support multiple inheritance
- C++ supports operator overloading whereas Java does not support operator overloading.
- C++ has pointers which can be used in the program whereas Java has pointers but internally.
- C++ uses a compiler only whereas Java uses both compiler and interpreter.
- C++ has both call by value and call by reference whereas Java supports only call by value.
- C++ supports structures and unions whereas Java does not support structure and unions
- Java supports unsigned right shift operator (>>) whereas C++ does not.
- C++ is interactive with hardware whereas Java is not that interactive with hardware.

## 42. How to concatenate string in C++ ?

The strings in C++ can be concatenated in two ways- one considering them string objects and second concatenating them C style strings.

```

#include <iostream>
1 using namespace std;
2
3 int main()
4 {
5     string s_1, s_2, fin;
6     cout << "Enter string";
7     getline (cin, s_1);

```

```

8   cout << "Enter string ";
9   getline (cin, s_2);
10  fin= s_1 + s_2;
11  cout << fin;
12
13  char str1[50], str2[50], fin[100];
14
15  cout << "Enter string";
16  cin.getline(str1, 50);
17
18  cout << "Enter string";
19  cin.getline(str2, 50);
20
21  strcat(str1, str2);
22
23  cout << "str1 = " << str1 << endl;
24  cout << "str2 = " << str2;
25
26  return 0;
27
28

```

## 43. How to convert char to int in C++ ?

There are three methods for converting char variable to int type variable.

These are as follows: – atoi()

– sscanf()

– typecasting

A sample code depicting all three functions are as follows:

```

1  #include<stdio.h>
2  #include<stdlib.h>
3  int main() {
4      char *s = "6790";
5      char d = 's';
6      int a,b,c;
7
8      sscanf(s, "%d", &a); // Using sscanf
9      printf("a : %d", a);
10
11     b = atoi(s); // Using atoi()

```

```

11  printf("b : %d", b);
12
13  c = (int)(d); // Using typecasting
14  printf("c : %d", c);
15
16  return 0;
17}
18

```

## 44. How to generate random numbers in C++ with a range?

Using the rand() function we can generate random numbers in C++ within a range.

```

1
2#include <iostream>
3#include <random>
4int main()
5{
6    int max=100, min=54,i;
7    int range = max - min + 1;
8    for (i=min; i<max;i++)
9    {
10        int num = rand() % range + min;
11        cout<<num;
12    }
13    return 0;
14}

```

## 45. What is stack in C++?

A linear data structure which implements all the operations (push, pop) in LIFO (Last In First Out) order. Stack can be implemented using either arrays or linked list. The operations in Stack are

- Push: adding element to stack
- Pop: removing element from stack

- isEmpty: returns true if stack is empty
- Top: returns the top most element in stack

## 46. What is conio.h in C++?

Conio.h is a header file used for console input and output operations and is used for creating text based user interfaces.

## 47. How to find absolute value in C++?

To find the absolute value in c++, we can use abs() function. The abs() function in C++ returns the absolute value of an integer number.

```
1
2#include <iostream>
3#include <cstdlib>
4using namespace std;
5
6int main()
7{
8    int a=3.456;
9    int x = abs(a);
10    cout << x;
11    return 0;
12}
```

## 48. How to exit from turbo C++?

To exit Turbo C++, use the Quit option under the File Menu, or press Alt + X.

## 49. What is iterator in C++?

Any object which has an ability to iterate through elements of the range it has been pointing to is called iterator.

## 50. What is :: in C++?

:: is called a scope resolution operator which is used to access global variables with the same name as of local variables, for defining functions outside the class, for accessing static variables, and for referring to a class inside of another class.

## 51. What is enum in C++?

enum is abbreviation of Enumeration which assigns names to integer constant to make a program easy to read. Syntax for the same:

```
enum enum_name{const1, const2, ..... };
```

## 52. What is endl in C++?

Endl is a predefined object of ostream class to insert a new line characters.

## 53. How to save a file in C++?

When you have written code in the file (notepad), save the file as "hello.cpp." If you want to write in a file using C++ code, you can do it using iostream and fstream libraries in C++.

```
1#include <iostream>
```

```

2#include <fstream>
3using namespace std;
4
5int main () {
6    ofstream file_name;
7    file_name.open ("sample.txt");
8    file_name<< "Write in the file";
9    file_name.close();
10    return 0;
11}

```

## 54. Which operators can be overloaded in C++?

List of operators that can be overloaded are:

+ , - , \* , / , % , ^ , & , | , ~ , ! , = , ++ , - , == , != , && , ||  
 += , -= , /= , %= , ^= , &= , |= , \*= , = , [ ] , ( ) , -> , ->\* , new , new [ ] , delete ,  
 delete [ ]

## 55. How to include all libraries in C++?

The library <bits/stdc++.h> in c++ is used to include all the libraries.

## 56. How to maximize turbo C++ window?

Alt+Enter is the keyboard shortcut used to maximize (full screen) turbo C++.

## 57. What is an expression in C++?

An expression is a combination of operators, constants and variables.

There seven types of expressions for examples:

- Constant expressions:  $89 + 10 / 4.0$
- Integral expressions:  $x * y$
- Floating expressions:  $17.89$
- Relational expressions:  $a <= b$
- Logical expressions:  $a > b \ \&\& \ a == 7$
- Pointer expressions:  $*ptr$
- Bitwise expressions:  $p \ll 5$

## 58. How to write a class in C++?

A class in C++ is the building block that leads to Object-Oriented programming and is a user-defined data type which holds data and functions. The syntax to write a class in C++ is as follows:

```

1 Class (keyword) Class_Name (this is user defined)
2 {
3     Access specifier: // private, public, protected
4     Data members //int, char, float, double etc. variables to be used
5     Member function() { } // Methods to access data members
6 };    //Class end

```

For example:

```

1
2 class Sample
3 {
4     // Access specifier
5     private:
6
7     // Data Members
8     string s;
9
10    // Member Functions()
11    void printname()
12    {
13        cout << s;
14    }
15 };

```

## 59. Which is the best C++ compiler?

There are several good compilers for C++ such as:

- MinGW / GCC
- Borland c++
- Dev C++
- Embracadero
- Clang
- Visual C++
- Intel C++
- Code Block

GCC and clang are great compilers if the programmer's target more portability with good speed.

Intel and other compilers target speed with relatively less emphasis on portability.

## 60. How to use strcmp function in C++?

strcmp() function is an in-built function of <string.h> header file which takes two strings as arguments and compares these two strings lexicographically.

The syntax of the function is as follows:

```
int strcmp(const char *l, const char *r);
```

```
1#include<stdio.h>
2#include<string.h>
3int main()
4{
5    // z has greater ASCII value than g
```



```

6   char a[] = "zfz";
7   char b[] = "gfg";
8
9   int r = strcmp(a, b);
10
11  if (r==0)
12      printf("Strings are equal");
13  else
14      printf("Strings are unequal");
15
16  printf("%d" , r);
17
18  return 0;
19}

```

## 61. How to write to a file in C++?

A file is read in c++ using a fstream header file.

```

1  #include <iostream>
2  #include <fstream>
3  using namespace std;
4  int main()
5  {
6      ofstream fout;
7      string r;
8
9      fout.open("test.txt");
10
11     while (fout) {
12         getline(cin, r);
13         if (r == "-1")
14             break;
15         fout << line << endl;
16     }
17     fout.close();
18
19     ifstream fin;
20     fin.open("test.txt");
21     while (fin) {
22         getline(fin, line);
23         cout << line << endl;
24     }
25     fin.close();
26     return 0;

```

```
26}  
27
```

## 62. What is stringstream in C++?

Stringstream is a class in c++ which associates a string object with a stream allowing to read from the string as if it were a stream. Syntax is as follows:

```
stringstream string_name(str);
```

Basic operations are as follows:

```
clear()  
str()  
<<  
>>
```

## 63. Why namespace std is used in C++?

If the program does not have using namespace std; then when you write cout <<; you would have to put std::cout <<; same for other functions such as cin, endl etc.

## 64. How to write hello world in C++?

Hello world in c++ is as follows:

```
1#include <iostream>  
2int main()  
3{  
4    std::cout << "Hello, World!";
```

```
5 return 0;
6}
```

## 65. How to calculate length of a string in C++?

The length of a string can be calculated by using in-built functions such as `length()`, `size()`, `strlen()` and also by loops (while and for).

```
1
2#include<iostream>
3#include<cstring>
4using namespace std;
5main() {
6    string s = "Hi I am Mr X";
7    char arr[] = "Hi I am Mr X";
8    cout << s.length();
9    cout << s.size();
10   cout << strlen(arr);
11
12   char *c = arr;
13   int count = 0;
14   while(*c != '\0'){
15       count++;
16       c++;
17   }
18   cout << count;
19   count = 0;
20   for(int i = 0; arr[i] != '\0'; i++){
21       count++;
22   }
23   cout << count;
24}
```

## 66. How to find length of string in C++?

There is an in-built function- `length()`- in C++ to find the length of the string. The code snippet to find the length of string is as follows

```
string str_1= "abcd";
cout << "The length of the string is: " << str_1.length();
```

# Advanced C++ Interview Questions

## 67. What is class in C++?

C language is not an object oriented programming language, so it is a constant attempt of C++ to introduce OOPs. Class is a user defined data type which defines a blueprint of data type. For example,

```
class Circle{  
  
public:  
float radius;  
}
```

## 68. What is inline function in C++?

Inline functions are functions used to increase the execution time of a program. Basically, if a function is inline, the compiler puts the function code wherever the function is used during compile time. The syntax for the same is as follows:

```
inline return_type function_name(argument list) {  
//block of code  
}
```

## 69. What is friend function in C++?

A friend function has the access rights to all private and protected members of the class.

```
1
2class Circle{
3    double radius;
4
5    public:
6        friend void printradius( Circle c );
7    };
8void printradius(Circle c ) {
9    /* Because printradius() is a friend of Circle, it can
10   directly access any member of this class */
11    cout << "Radius of circle: " << c.radius;
12}
13int main() {
14    Circle c;
15
16    // Use friend function to print the radius.
17    printradius( c);
18
19    return 0;
20}
```

## 70. What is exception handling in C++?

Exceptions are errors that happen during execution of code. To handle them we use throw, try & catch keywords.

## 71. How to use vector in C++?

A sample code to see how to use vector in C++ is as follows:

```
1#include<iostream>
2#include<vector>
3using namespace std;
4int main()
5{
6vector <string> vec_1;
```

```

7vec_1.push_back("sample code");
8vec_1.push_back("change example");
9for(vector <string>::iterator i=vec_1.begin();i!=vec_1.end();++i)
10cout<<*i;
11return 0;
12}

```

## 72. What is vector in C++?

A sequence of containers to store elements, a vector is a template class of C++. Vectors are used when managing ever-changing data elements. The syntax of creating vector.

vector <type> variable (number of elements)

For example:

```
vector <int> rooms (9);
```

## 73. What is scope resolution operator in C++?

Scope resolution operator in c++ is denoted by double colon (::). It can be used:

- when there is a local variable with same name as of global variable
- When a function has to be defined outside a class
- When class's static variables needs to be accessed
- When a class inside another class has to be referred
- In case of multiple Inheritance

## 74. What are character constants in C++?

Character constant are members of the character set in which a program is written which is surrounded by single quotation marks (').

## 75. What are templates in C++?

A feature that allows functions and classes to operate with generic types that means a function or class can work on different data types without being rewritten is called template.

## 76. How to sort vector in C++?

```
1  "#include <bits/stdc++.h>
2  using namespace std;
3  int main()
4  {
5      vector<int> vec{ 1,9,4,3,2,8,5,7};
6
7      sort(vec.begin(), vec.end());
8
9      for (auto x : v)
10         cout << x << " ";
11
12     return 0;
13 }
14 "
```

## 77. What is pure virtual function in C++?

A pure virtual function is a type of virtual function which does not have implementation, but is only declared. It is declared by assigning 0 in declaration. Syntax for the same is as follows:

```
1 class Test
2 {
3     // Data members of class
```

```

4public:
5
6    virtual void show() = 0;
7
8    /* Other members */
9};

```

## 78. How to use map in C++?

Associative containers storing a combination of a key value or mapped value is called Maps. Syntax: `map<key_type , value_type> map_name;`

```

1
2#include <iostream>
3#include <iterator>
4#include <map>
5
6using namespace std;
7
8int main()
9{
10    map<int, int> test;
11
12    // inserting elements
13    test.insert(pair<int, int>(1, 2));
14    test.insert(pair<int, int>(2, 3));
15
16    map<int, int>::iterator itr;
17    for (itr = test.begin(); itr != test.end(); ++itr) {
18        cout << itr->first
19        cout << itr->second << '\n';
20    }
21    return 0;
22)

```

## 79. How to empty a vector in C++?

`Std::vector::empty` tests whether a vector is empty or not. A sample code for illustrating the same is as follows:

```

1#include <iostream>
2#include <vector>

```



```

3
4int main ()
5{
6    std::vector<int> vec;
7    int add (0);
8
9    for (int i=1;i<=5;i++) vec.push_back(i);
10
11    while (!vec.empty())
12    {
13        add+= vec.back();
14        vec.pop_back();
15    }
16    std::cout << add;
17
18    return 0;
19}
20

```

## 80. What is visual C++?

C++ is a standardized language and Visual C++ is a product that implements the standard of C++. One can write portable C++ programs using Visual C++, but one can also use Microsoft-only extensions which destroys portability but enhances your productivity.

## 81. How to remove segmentation fault in C++?

Segmentation fault indicates an error memory corruption. In layman terms, when a piece of code tries to do read and write operation in a read only location in memory. Below are the reasons and solutions for segmentation error:

Reason: Accessing an address that is freed

```

1int* p = malloc(8);
2*p = 100;
3
4 free(p);

```

```

5 *p = 110;
6
7Solution: Before freeing the pointer check the assignment or any operation required to perform
8
9Reason: Accessing out of array index bounds
10int arr[2];
11arr[3] = 10;
12Solution: Correcting the array bound
13
14Reason: Improper use of scanf()
15int n = 2;
16scanf("%d",n);
17Solution: To avoid this is the only solution
18
19Reason: Dereferencing uninitialized pointer
20int *p;
21printf("%d",*p);
22Solution: A pointer must point to valid memory before accessing it.
23
24Reason: Stack Overflow
25Solution: It can be resolved by having a base condition to return from the recursive function
26

```

## 82. What is stl in C++ with example?

STL in C++ is a library and abbreviation of Standard Template Library. STL is a generalized library that provides common programming data structures/ container classes, functions, algorithms, and iterators. STL has four components

- Algorithms: Searching and sorting algorithms such as binary search, merge sort etc.
- Containers: Vector, list, queue, arrays, map etc.
- Functions: They are objects that act like functions.
- Iterators: It is an object that allows transversing through elements of a container, e.g., `vector<int>::iterator`.

### 83. What is flush in C++?

std::flush synchronizes the stream buffer with its controlled output sequence.

### 84. How to initialize a 2d vector in C++?

The syntax to initialize a 2d vector is as follows:

```
std::vector<std::vector<int> > name_of_vector;
```

For example: `std::vector<std::vector<int> > v { { 1, 2, 1 }, { 2, 6, 7 } };`

## C++ Programming Interview Questions

### 85. How to input a string in C++?

There are two ways to input a string in C++.

Way 1:

```
1string str_1;  
2cout << "Enter the string";  
3cin >> str_1;
```

Way 2:

```
1string str_1;  
2cout << "Enter the string";  
3getline (cin, str_1)
```

### 86. What is virtual function in C++?

A function is said to be virtual if it is defined in base class and is expected to be redefined in derived class.

```
1
2#include <iostream>
3using namespace std;
4
5class Base_Class {
6    public:
7        virtual void print_msg() {
8            cout << "Base";
9        }
10};
11
12class Derived_Class : public Base_Class {
13    public:
14        void print_msg() {
15            cout << "Derived";
16        }
17};
```

## 87. How to find length of array in C++?

The length of an array in C++ can be calculated using sizeof() function. The code depicting the same is mentioned below.

```
1
2#include <iostream>
3using namespace std;
4
5void main()
6{
7    int a[] = {0,1,2,3,4,5};
8    int a_size = sizeof(a)/sizeof(a[0]);
9    cout << "Size of the array is: " << a_size;
10}
```

## 88. How to convert int to string in C++?

There are 2 approaches to convert integer variables to string. Both the approaches with a sample code are mentioned below.

Approach 1:

```
1#include<iostream>
2#include<string>
3using namespace std;
4void main()
5{
6    int n= 1;
7    string s= to_string(n);
8    cout << s;
9}
```

Approach 2:

```
1
2#include<iostream>
3#include <sstream>
4#include <string>
5using namespace std;
6int main()
7{
8    int n = 17;
9
10    // declaring output string stream
11    ostringstream s1;
12
13    // Sending a number as a stream into output str
14    s<< n;
15    // the str() converts number into string
16    string fin = s.str();
17    // Displaying the string
18    cout << fin;
19    return 0;
20}
```

## 89. How to sort a string in C++?

To sort a string, the sort function in c++ can be used. The sample code for the same is as follows.

```
1#include<iostream>
2#include <stdio.h>
3using namespace std;
4void str_sort(string &s)
```

```

5{
6    sort(s.begin(), s.end());
7    cout << s;
8}
9
10int main()
11{
12    string s = "anmbdfc";
13    str_sort(s);
14    return 0;
15}
16Output: abcdmfn
17"
18

```

## 90. How to convert string to int in C++?

This can be done using the `stoi()` or `atoi()` function:

```

1
2int main()
3    {
4        string str_value = "1122";
5        int int_value = stoi(str_value);
6    }
7    or
8    int main()
9    {
10        const char *str_ptr = "1122";
11        int int_value = atoi(str_ptr);

```

## 91. How to compare two strings in C++?

Two string can be compared using `strcmp()` function. It return boolean value; if it returns '0' then the strings are same and if it returns '1' then the two strings are not same.

```

1int main()
2{
3    if (strcmp(str_value_a, str_value_b) == 0)
4        cout<<"These strings are the same";

```

```

5         else
6             cout<<"These strings are not the same";
7     }

```

## 92. How to set precision in C++?

Precision in C++ can be set by using the following functions- floor(), ceil(), round(), trunc() and setprecision(). Using setprecision() in a program.

```

1 #include<bits/stdc++.h>
2 using namespace std;
3
4 void main()
5 {
6     double p = 8.04149;
7     cout << fixed << setprecision(2) << p<<endl;
8 }
9
10 The output will be 8.04.

```

## 93. What is this pointer in C++?

Using this pointer, every object is provided access to its own address. It is an implicit parameter to all member functions. Only member functions have a this pointer and not a friend function.

```

1 #include<iostream>
2 using namespace std;
3
4 class sample
5 {
6 private:
7     int a;
8 public:
9     void set_var (int a)
10    {
11        this->a = a;
12    }
13    void print()
14    {
15        cout << x ;
16    }
17 }

```

```

15     }
16};
17
18int main()
19{
20    sample obj;
21    int a = 2;
22    obj.set_var(a);
23    obj.print();
24    return 0;
25}
26

```

## 94. How to concatenate two strings in C++?

```

1
2#include <iostream>
3using namespace std;
4int main
5{
6    string str_a = "Hi, My name is";
7    string str_b = "Raj";
8    string str_c = str_a + str_b;
9    cout<<"The string is:"<<str_c;
10    return 0;
11}

```

## 95. How to find string length in C++?

You can do this by using `size()` function.

```

1int main()
2{
3    string str[]="Hello World!";
4    int g = str.size();
5    cout<<"The size of the string is"<<g;
6}

```

7or you can use the `strlen` function."

## 96. How to initialize vector in C++?



There are multiple ways to do it:

You can do it like arrays:

```
vector<int> value{ 11, 22, 33 };
```

or by pushing values one by one:

```
vector<int> value;
```

```
value.push_back(11);
```

```
value.push_back(22);
```

```
value.push_back(33);
```

```
value.push_back(44);
```

```
value.push_back(55);
```

## 97. How to use getline in C++?

```
1int main()
2{
3    string yourname;
4    getline (cin,yourname);
5
6}
```

## 98. How to take input in C++?

You can use the cin function to take in values, like such:

```
1int main()
2{
3    int age;
4    cout<<"Enter your name! ";
5    cin>>age;
6}
```

## 99. How to print a string in C++?

```
int main()
1{
```

```

2      string str_value[]="Hello-World!";
3      cout<<"The string is:"<<str_value;
4}"
5

```

## 100. How to use sort function in C++?

```

1"syntax: sort(the element of the array from where you want to start the sorting,the element of
2int main()
3{
4    int int_value[5]={1,2,3,4,5};
5    sort(int_value,int_value+5);
6    cout<<int_value;
7}"

```

## 101. How to reverse a vector in C++?

syntax: reverse(the index you want to start reversing at,the index you want to end reversing at)

```

vector<int> value = {11,22,33};
reverse(value.begin(),value.end());

```

## 102. How to return a vector in C++?

```

1
2#include<iostream>
3#include<vector>
4using namespace std;
5
6vector<int> fun(vector<int> value_c)
7{
8    vector<int> value_d;
9    for(int j=0;j<value_c.size();j++)
10
11        value_d.push_back(value_c[j]+4);
12
13    return value_d;
14    //returning the vector
15}

```

```

16
17int main()
18{
19
20    vector<int> value_a,value_b;
21
22    //We put values in vector value_a
23    value_a.push_back(1);
24    value_a.push_back(2);
25    value_a.push_back(3);
26
27
28    value_b = fun(value_a);
29    //receiving the vector
30
31    return 0;
32} "
```

## 103. How to reverse an array in C++?

```

1
2#include<iostream>
3using namespace std;
4
5int main()
6{
7int n;
8cin >> n;
9int a[n];
10int i;
11for(i = 0; i < n; i++)
12{
13cin >> arr[i];
14}
15for(i = n-1; i >= 0; i--)
16{
17cout << arr[i] << " ";
18}
19cout << endl;
20return 0;
21}
22"
```

## 104. How to split a string in C++?

```
1
2#include <stdio.h>
3#include <string.h>
4
5int main ()
6{
7    char * flag_pointer;
8    char string_value[10]="Great Learning!";
9    flag_pointer =strtok (string_value," !");
10
11    while (flag_pointer!=NULL)
12    {
13        cout<<string_value;
14        flag_pointer=strtok(NULL," !");
15    }
16    return 0;
17}
```

## 105. How to sort string in C++?

To sort a string, the sort function in c++ can be used. The sample code for the same is as follows.

```
1
2#include<iostream>
3#include <stdio.h>
4using namespace std;
5void str_sort(string &s)
6{
7    sort(s.begin(), s.end());
8    cout << s;
9}
10
11int main()
12{
13    string s = "anmbdfc";
14    str_sort(s);
15    return 0;
16}
17Output: abcdfmn
18"
```

# OOPS Interview Questions C++

## 106. What is constructor in C++?

Constructor is a method in class which has the same name as that of class and is followed by parentheses (). It is automatically called when an object of a class is created.

```
1
2 class Hello {           // The class
3     public:             // Access specifier
4     Hello() {           // Constructor
5         cout << "Hello World!";
6     }
7 };
8
9 int main() {
10     Hello obj;         // Create an object of Hello (this will call the constructor)
11     return 0;
12 }
```

## 107. What is inheritance in C++?

Just like a child inherits some features and attributes from his parent similarly a class inherits attributes and methods from another class. The parent class is called base class and the child class is called derived class.

```
1 // Base class
2 class Food_Item{
3     public:
4     void taste() {
5         cout << "The taste of every food item is different. \n" ;
6     }
7 };
8 // Derived class
9 class Chips: public Food_Item{
10     public:
```

```

11 void taste() {
12     cout << "The taste of chips is salty \n" ;    }
13};
14"
15

```

## 108. What is object in C++?

Class in C++ provides a blueprint for object, that means, object is created from the class.

```

1 For example,
2 class Circle{
3
4 public:
5     float radius;
6 }
7
8 Circle C1;
9 Circle C2;

```

## 109. What is encapsulation in C++?

To prevent access to data directly, Encapsulation is the process that combines data variables and functions in a class. This is achieved by doing the following:

1. Making all data variables private.
2. Creating getter and setter functions for data variables.

## 110. What is abstraction in C++?

Abstraction in C++ means showing only what is necessary. It's part of Object oriented Programming concept. Abstraction is used to hide any irrelevant data to the outside world and only showing what is absolutely

necessary for the outside world to use.

eg. Classes use the abstraction concept to only show relevant data types or elements. This is done through access specifiers such as: public, private, protected.

## 111. What is oops in C++?

OOP or Object Oriented Programming in C++ is a type of programming in which you create objects and classes to emulate real world concepts such as Abstraction, Polymorphism, Encapsulation, Inheritance.

Here classes are data types that allow you list several types of data within it and even functions. You can access these classes with the help of class objects.

## 112. What is member function in C++?

Member functions are those functions that you declare within a class, they are members of the class. You can reference them using class objects. Eg.

```
1 class A
2 {
3     public:
4         int add(int b)
5         {
6             a = b * 10;
7             return a;
8         };
9 };
```

## 113. What is virtual base class in C++?

Let's understand this with an example.

You Have 4 classes: W,X,Y,Z

Here X & Y inherit from W. So they both have similar features being inherited from W.

Now, Z inherits from both X & Y

Here Z may inherit similar features from X & Y as they both have inherited them from W. This can cause issues and that's why we use virtual base classes as they stop multiple features of a class from appearing in another class.

## 114. How to access private members of a class in C++?

Private members of the class are not accessible by object or function outside the class. Only functions inside the class can access them or friend functions. However, pointers can be used to access private data members outside the class. Sample code is as follows:

```
1
2#include <iostream>
3using namespace std;
4
5class sample_test{
6private:
7    int n;
8
9public:
10    sample_test() { n = 45; }
11    int display() {
12return n;
13    }
13};
```



## **115. How to call base class constructor from derived class in C++?**

A base class constructor will be called whenever the derived class constructor is called. Upon the creation of a derived class object the order of constructor execution is : base class constructor then Default class constructor.

## **116. What is an abstract class in C++?**

An abstract class in C++ is such that cannot be used directly and is used to form a base class for others to inherit from.

If you create an object for an abstract class the compiler will throw an error at you.

## **117. What is containership in C++?**

Containership in C++ is a relationship in which a class's object is nested within another class. The class that contains the object is called a container class and the class whose object is stored is called a contained class.

## **118. What is data hiding in C++?**

An object oriented technique of hiding data members is called data hiding. In other words, giving restricted access to the data members so as to maintain object integrity.

## 119. What is runtime polymorphism in C++?

Polymorphism means having many forms either it is a function or operator in programming.

Runtime polymorphism is achieved by function overriding.

```
1
2#include <bits/stdc++.h>
3using namespace std;
4
5class parent
6{
7public:
8
9    void print()
10    { cout<< ""base class""; }
11};
12
13class child:public parent
14{
15public:
16
17    void print()
18    { cout<< ""derived class""; }
19};
20
21int main()
22{
23    parent *p;
24    child c;
25    p = &c;
26
27    //virtual function, binded at runtime (Runtime polymorphism)
28    p->print();
29    return 0;
30}
```

## 120. What is copy constructor in C++?

A copy constructor is a constructor which creates an object by initializing it with an object of the same class, which has been created previously. The

syntax for copy constructor is as follows:

```
classname (const classname &obj) {  
    // body of constructor  
}
```

## **121. How is modularity introduced in C++?**

Modularity is a way of mapping encapsulated abstractions into real and physical modules which is closely related to Encapsulation. It is a concept in which separate programs are divided into separate modules.

For example, when building a house it is built in modular way. First foundation is laid, then structure is made and so on.

## **122. What is the size of empty class in C++?**

Size of an empty class is 1 byte generally just to ensure that the two different objects will have different addresses.