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Console Input Output Operations, Methods in C++

Learn: What are the **console input, output related methods, operations in C++**? In this topic we learn how to use input / output operations in C++ language.
Submitted by Amit Shukla, on June 17, 2017

Console input / output function take input from standard input devices and compute and give output to standard output device.

Generally, keyboard is standard input device and monitor is standard output device.

In case of C++ it uses streams to perform input and output operations in standard input output devices (keyboard and monitor). A stream is an object which can either insert or extract the character from it.

The standard C++ library is `iostream` and standard input / output functions in C++ are:

1. **cin**
2. **cout**

There are mainly two types of consol I/O operations form:

1. Unformatted consol input output
2. Formatted consol input output

1) Unformatted consol input output operations

These input / output operations are in unformatted mode. The following are operations of unformatted consol input / output operations:

A) void get()

It is a method of `cin` object used to input a single character from keyboard. But its main property is that it allows wide spaces and newline character.

Syntax:

```
char c=cin.get();
```

Example:

Copy

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

int main()
{
        char c=cin.get();
        cout<<c<<endl;

        return 0;
}
```

Output

B) void put()

It is a method of `cout` object and it is used to print the specified character on the screen or monitor.

Syntax:

```
cout.put(variable / character);
```

Example:

Copy

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

```cpp
int main()
{
        char c=cin.get();
        cout.put(c); //Here it prints the value of variable c;
        cout.put('c'); //Here it prints the character 'c';

        return 0;
}
```

Output

```
I
Ic
```

C) getline(char *buffer,int size)

This is a method of `cin` object and it is used to input a string with multiple spaces.

Syntax:

```cpp
char x[30];
cin.getline(x,30);
```

Example:

Copy

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

int main()
{
        cout<<"Enter name :";
        char c[10];
        cin.getline(c,10); //It takes 10 charcters as input;
        cout<<c<<endl;

        return 0;
}
```

Output

```
Enter name :Divyanshu
Divyanshu
```

D) write(char * buffer, int n)

It is a method of cout object. This method is used to read n character from buffer variable.

Syntax:

```
cout.write(x,2);
```

Example:

Copy

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

int main()
{
        cout<<"Enter name : ";
        char c[10];
        cin.getline(c,10); //It takes 10 charcters as input;
        cout.write(c,9); //It reads only 9 character from buffer c;

        return 0;
}
```

Output

```
Enter name : Divyanshux
Divyanshu
```

E) cin

It is the method to take input any variable / character / string.

Syntax:

```
cin>>variable / character / String / ;
```

Example:

Copy

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

int main()
{
    int num;
    char ch;
    string str;

    cout<<"Enter Number"<<endl;
    cin>>num; //Inputs a variable;
    cout<<"Enter Character"<<endl;
    cin>>ch; //Inputs a character;
    cout<<"Enter String"<<endl;
    cin>>str; //Inputs a string;

    return 0;
}
```

Output

```
Enter Number
07
Enter Character
h
Enter String
Deepak
```

F) cout

This method is used to print variable / string / character.

Syntax:

```
cout<< variable / charcter / string;
```

Example:

Copy

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

int main()
{
    int num=100;
    char ch='X';
```

```cpp
    string str="Deepak";

    cout<<"Number is "<<num<<endl; //Prints value of variable;
    cout<<"Character is "<<ch<<endl; //Prints character;
    cout<<"String is "<<str<<endl; //Prints string;

    return 0;
}
```

Output

```
Number is 100
Character is X
String is Deepak
```

2) Formatted console input output operations

In formatted console input output operations we uses following functions to make output in perfect alignment. In industrial programming all the output should be perfectly formatted due to this reason C++ provides many function to convert any file into perfect aligned format. These functions are available in header file `<iomanip>`. `iomanip` refers input output manipulations.

A) width(n)

This function is used to set width of the output.

Syntax:

```cpp
cout<<setw(int n);
```

Example:

Copy

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

int main()
{
        int x=10;
        cout<<setw(20)<<variable;

        return 0;
}
```

Output

```
                        10
```

B) fill(char)

This function is used to fill specified character at unused space.

Syntax:

```
cout<<setfill('character')<<variable;
```

Example:

Copy

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

int main()
{
        int x=10;
        cout<<setw(20);
        cout<<setfill('#')<<x;

        return 0;
}
```

Output

```
##################10
```

D) precison(n)

This method is used for setting floating point of the output.

Syntax:

```
cout<<setprecision('int n')<<variable;
```

Example:

Copy

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

int main()
{
        float x=10.12345;
        cout<<setprecision(5)<<x;

        return 0;
}
```

Output

```
10.123
```

E) setflag(arg 1, arg,2)

This function is used for setting format flags for output.

Syntax:

```
setiosflags(argument 1, argument 2);
```

F) unsetflag(arg 2)

This function is used to reset set flags for output.

Syntax:

```
resetiosflags(argument 2);
```

G) setbase(arg)

This function is used to set basefield of the flag.

Syntax:

```
setbase(argument);
```

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Run-length encoding (find/print frequency of letters in a string)

Sort an array of 0's, 1's and 2's in linear time complexity

Checking Anagrams (check whether two string is anagrams or not)

Relative sorting algorithm

Finding subarray with given sum

Find the level in a binary tree with given sum K

Check whether a Binary Tree is BST (Binary Search Tree) or not

1[0]1 Pattern Count

Capitalize first and last letter of each word in a line

Print vertical sum of a binary tree

Print Boundary Sum of a Binary Tree

Reverse a single linked list

Greedy Strategy to solve major algorithm problems

Job sequencing problem

Root to leaf Path Sum

Exit Point in a Matrix

Find length of loop in a linked list

Toppers of Class
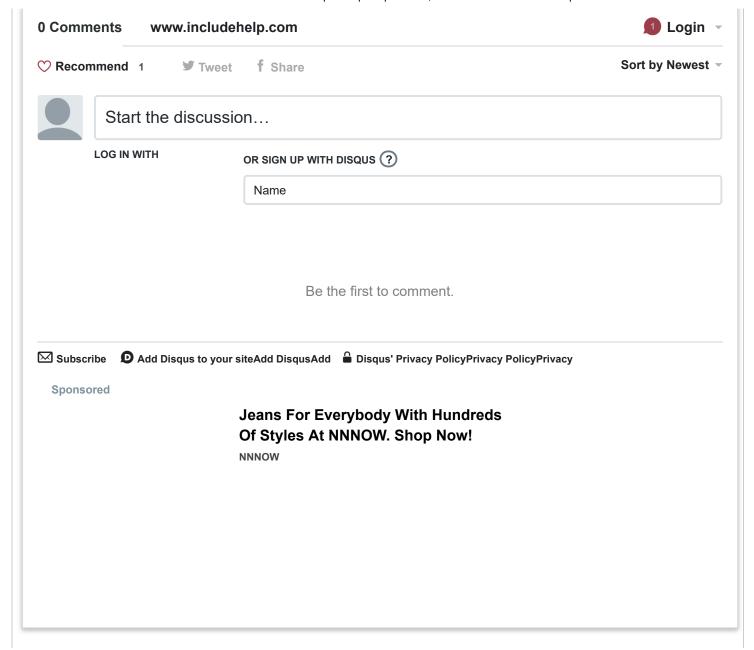
Print All Nodes that don't have Sibling

Transform to Sum Tree

Shortest Source to Destination Path

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