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# C++ Return by Reference

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In this article, you'll learn how to return a value by reference in a function and use it efficiently in your program.

In C++ Programming, not only can you pass values by reference to a function but you can also return a value by reference.

To understand this feature, you should have the knowledge of:

Global variables

### **Example: Return by Reference**

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

// global variable
int num;

// function declaration
int& test();

int main() {

    // assign 5 to num variable
    // equivalent to num = 5;
    test() = 5;

    cout << num;

    return 0;
}

// function definition
// returns the address of num variable
int& test() {
    return num;
}</pre>
```

### Output

5

In program above, the return type of function <code>[test()]</code> is <code>[int&]</code>. Hence, this function returns a reference of the variable <code>[num]</code>.

The return statement is return num; . Unlike return by value, this statement doesn't return value of num, instead it returns the variable itself (address).

So, when the **variable** is returned, it can be assigned a value as done in test() = 5;

This stores 5 to the variable num, which is displayed onto the screen.

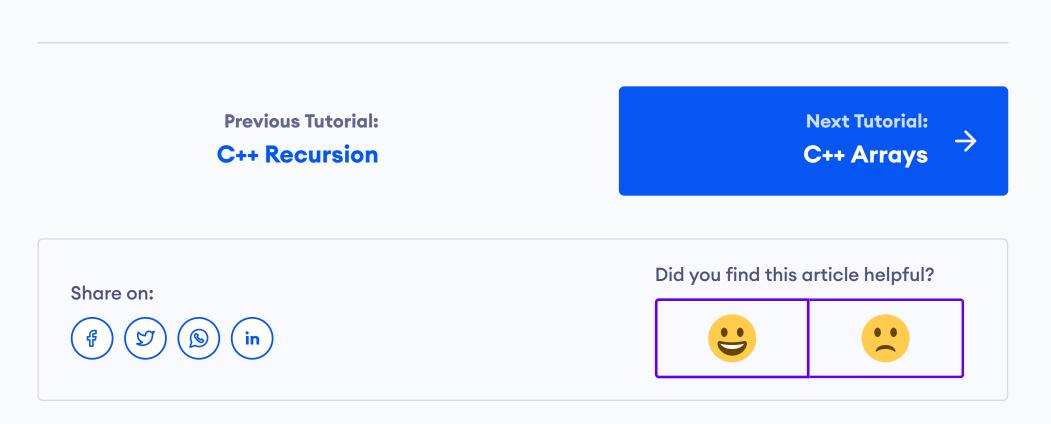
## Important Things to Remember When Returning by Reference.

• Ordinary function returns value but this function doesn't. Hence, you cannot return a constant from the function.

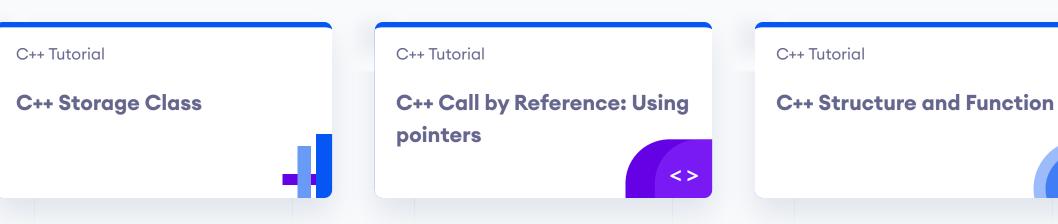
```
int& test() {
   return 2;
}
```

You cannot return a local variable from this function.

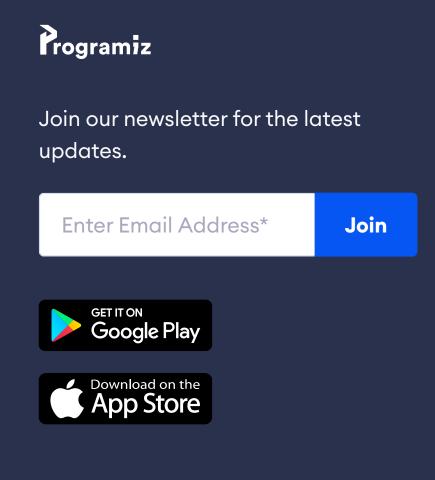
```
int& test() {
   int n = 2;
   return n;
}
```



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