Pass by Reference in Functions

In this lesson, you will learn a method to pass the reference of the actual parameters to the function.

We'll cover the following

Introduction

Suppose you have sent an email to your friend with a link to a file present on **Google Drive**. Your friend made some changes to the document. Since you and your friend are sharing the same file, you will both see the change made by either of you in the document.

Pass by reference is just like sending a link to the file that is present on the Google Drive.

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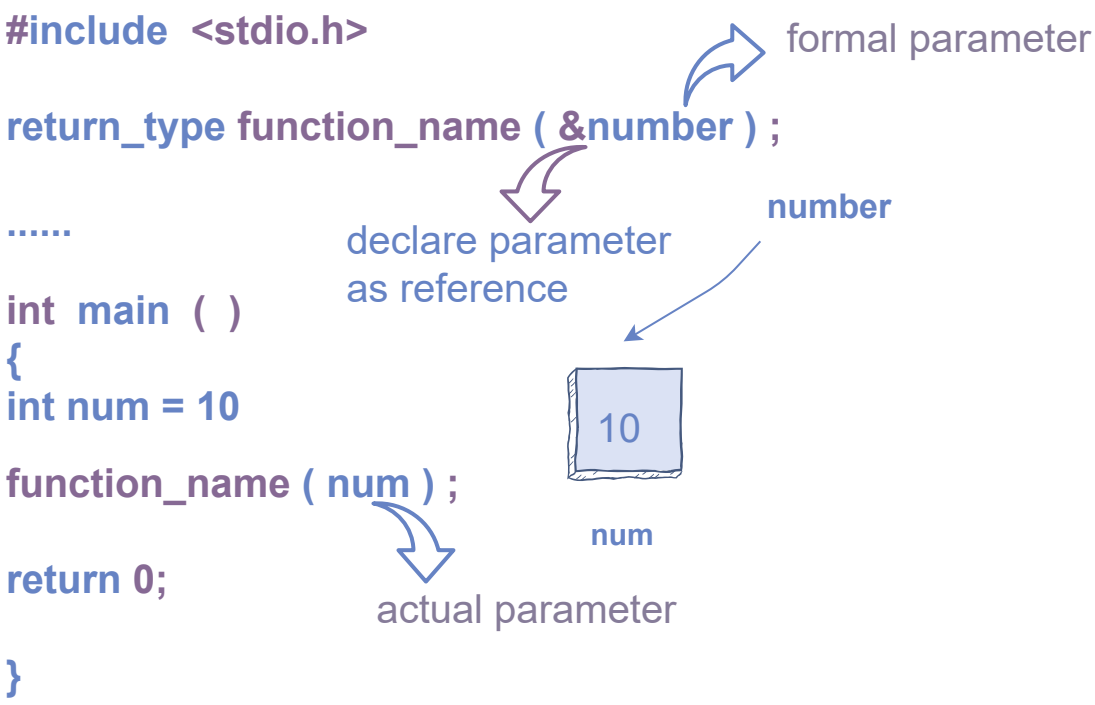
*In **pass by reference**, when we call a function, we pass the address of the actual parameters to the formal parameters in the function.*

In pass by reference, the actual and formal parameters refer to the same memory location. Any changes made in the formal parameters inside the function affect the values of actual parameters in the main function.

Basic syntax

The general syntax for passing a reference to the function parameters is given

below:



When we want to pass the value by reference, we declare function parameters as references rather than the normal parameters. To declare a function parameter as a reference, we have to ampersand `&` before the function parameter.

Example program

Press the **RUN** button and see the output!

```
#include <iostream>

using namespace std;
// function definition
void passReference(int &number) {
  // Multiply the number by 10
  number = number * 10;
  cout << "Value of number inside the function = " << number << endl;
}

int main() {
  // Initialize variable
  int number = 10;
  cout << "Value of number before function call = " << number << endl;
  // Call function
  passReference(number);
  cout << "Value of number after function call = " << number << endl;

  return 0;
}
```

Explanation

In the code above, we have two functions:

- passReference function
- main function

passReference function

Line No. 5: The `passReference` function takes a value of type `int` by reference. It performs its task and then returns nothing in output.

Line No. 7: Multiplies the `number` by `10` and stores the result in the `number`

Line No. 8: Prints the updated value of the `number`

main function

Line No. 13: Initializes a variable `number`

Line No. 14: Prints the value of the `number` before the function call

Line No. 16: Calls a function `passReference`. The execution control is transferred to **Line No. 5**

Line No. 17: Prints the value of the `number` after the function call

Q

What is the output of the following code?

```
void cube(int &number) {
  number = number * number * number;
  cout << "number = " << number << endl;
}

int main() {
  int number = 5;
  cube(number);
  cout << "number = " << number << endl;

  return 0;
}
```

Retake Quiz

This is all about passing values to the functions. In the next lesson, we will classify the variable according to their scope in the program.