

Computer science : c++

Functions in C++

A function is block of code which is used to perform a particular task, for example let's say you are writing a large C++ program and in that program you want to do a particular task several number of times, like displaying value from 1 to 10, in order to do that you have to write few lines of code and you need to repeat these lines every time you display values. Another way of doing this is that you write these lines inside a function and call that function every time you want to display values. This would make you code simple, readable and reusable.

Syntax

```
return_type function_name (parameter_list)
{
    //C++ Statements
}
```

A simple function

```
#include <iostream>
using namespace std;
/* This function adds two integer values
 * and returns the result
 */int
sum(int num1, int num2){
    int num3 = num1+num2; return num3;
}

int main(){
    //Calling the function
    cout<<sum(1,99);
    return 0;
}
```

Output: 100

The above program can be written like this:

```
#include <iostream>
using namespace std;
//Function declaration
int sum(int,int);

//Main function
int main(){
    //Calling the function
    cout<<sum(1,99);
    return 0;
}
/* Function is defined after the main method
*/
int sum(int num1, int num2){
    int num3 = num1+num2;
    return num3;
}
```

Function Declaration: You have seen that I have written the same program in two ways, in the first program I didn't have any function declaration and in the second program I have function declaration at the beginning of the program. The thing is that when you define the function before the main() function in your program then you don't need to do function declaration but if you are writing your function after the main() function like we did in the second program then you need to declare the function first, else you will get compilation error.

syntax of function declaration:

```
return_type function_name(parameter_list);
```

Function definition: Writing the full body of function is known as defining a function.

syntax of function definition:

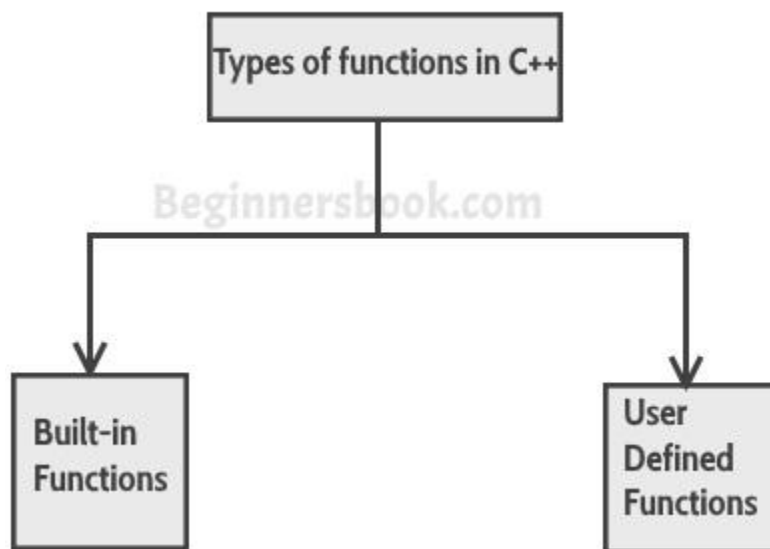
```
return_type function_name(parameter_list) {  
    //Statements inside function  
}
```

Calling function: We can call the function like this:

```
function_name(parameters);
```

Types of function

We have two types of function in C++:



- 1) Built-in functions
- 2) User-defined functions

1) Built-in functions

Built-in functions are also known as library functions. We need not to declare and define these functions as they are already written in the C++ libraries such as `iostream`, `cmath` etc. We can directly call them when we need.

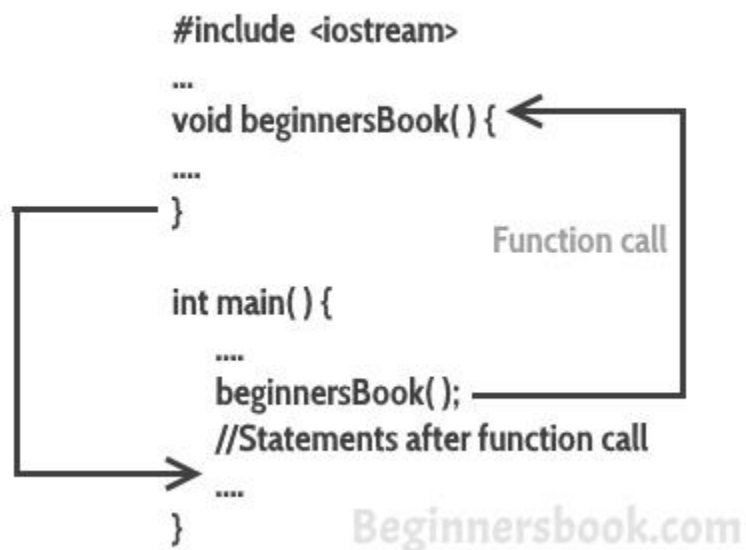
C++ built-in function

Here we are using built-in function `pow(x,y)` which is x to the power y . This function is declared in `cmath` header file so we have included the file in our program using `#include` directive.

```
#include <iostream>
#include <cmath>
using namespace std;
int main(){
    /* Calling the built-in function
     * pow(x, y) which is x to the power y
     * We are directly calling this function
     */
    cout<<pow(2,5);
    return 0;
}
```

Output: 32

2) User-defined functions



User-defined functions

```
#include <iostream>
#include <cmath>
using namespace std;
//Declaring the function sum
int sum(int,int);

int main(){
    int x, y;
    cout<<"enter first number: ";
    cin>> x;

    cout<<"enter second number: ";
    cin>>y;

    cout<<"Sum of these two :"<<sum(x,y);
    return 0;
}
//Defining the function sum
int sum(int a, int b) {
    int c = a+b;
    return c;
}
```

Output:

```
enter first number: 22  
enter second number: 19  
Sum of these two :41
```