

Creating a Function

In this lesson, we will learn how to create functions in C++ and use them in our program.

WE'LL COVER THE FOLLOWING ^

- Declaration
- Definition

Similar to variables, functions need to be defined before compilation. Every function has a name and a set of operations it needs to perform. The first part of creating a function **declaration**.

Declaration

The declaration of a function means defining its **name**, **type**, and **argument(s)**. This may sound confusing right now but we'll get the hang of it really soon. Here's the template for function declaration:

```
type functionName(argument(s));
```



Let's take a look at the three components one by one:

- **type** refers to the type of value the function produces. In formal terms, we say that a function **returns** something when we use it. The type of object it returns must be specified in the declaration. So, if a function returns a number, its **type** would be **int** or **double** etc. Any data type available in C++ can be used as the function's type. If the function does not return anything, its type will be **void**.
- **functionName** is simply the label we'll use for the function, just like we do for variables.
- **arguments** are the inputs of a function. We can give a function different

objects as arguments, and the function will then perform operations using them. For each argument, a data type and name must be defined. A function could also have no arguments at all. In that case, the **arguments** section remains empty.

Now that we've been through all the components of function declaration, let's see a few examples:

```
int sum(int num1, int num2); // Returns an integer which is a sum of
                             //two integers, num1 and num2

string blah(); // Returns a string and does not contain any arguments

double[] createSortedArray(int size); // Returns an array of doubles

void printName(string name); // Prints a string
```

Note: It is a good practice to give meaningful names to the function and its arguments. That makes the code much more readable.

It's time to move on to the second part of creating a function: **definition**.

Definition

The definition (also known as implementation) of a function refers to the set of instructions which the function performs. Without the definition, a function will not know what to do. Hence, we need to make sure our implementation is flawless and doesn't produce any bugs. Here's the template for the definition of a function:

```
type functionName(arguments) {
    // Definition
}
```

The curly braces, **{ }**, contain the definition of a function. This is known as the **scope** of the function (more on this later). Here, we can write a normal C++ code which will execute once every time the function is called.


You may have noticed by now that the **int main(){ }** in a C++ program is also a function! It is the function that the compiler runs to execute our code.

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To return something from a function, we use the `return` command. This ends the function.

Below, we've defined a few functions and called them in the main program. The first approach only uses the definition to create a function. The second approach first declares the functions and then defines them below the `main()`.

 Definition

 Declaration+Definition

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

int sum(int num1, int num2){
    return num1 + num2;
}




string blah(){
    string s = "Hello World";
    return s;
}

void printName(string name){
    cout << name << endl;
    // No return statement needed as this is a void function
}

int main()
{
    int x = 10;
    int y = 20;
    int total = sum(x, y); // We store the returned value into a variable
    // of the corresponding type
    cout << total << endl;

    string str = blah();
    cout << str << endl;

    printName("Educative"); // This is a void function, so it doesn't need to be stored
}
```



At this point, we're equipped to write basic functions. The basic structure of the functions is clear. Remember, a function can call other functions as well. After all, the `main` function does that as well.

In the next lesson, we will learn some interesting details about the arguments of a function.

