The Islamic University of Diwaniya

Computer Technique Engineering Department

Functions

Lecture:4

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C++ Functions

A function is a block of code that performs a specific task. Dividing a complex problem into smaller chunks makes our program easy to understand and reusable.

There are two types of function:

1. **Standard Library Functions:** Predefined in C++
2. **User-defined Function:** Created by users

we will focus mostly on user-defined functions.

C++ User-defined Function

C++ allows the programmer to define their own function.

A user-defined function groups code to perform a specific task and that group of code is given a name (identifier).

When the function is invoked from any part of the program, it all executes the codes defined in the body of the function.

C++ Function Declaration

The syntax to declare a function is:

```
returnType functionName (parameters{
    // function body
}
```

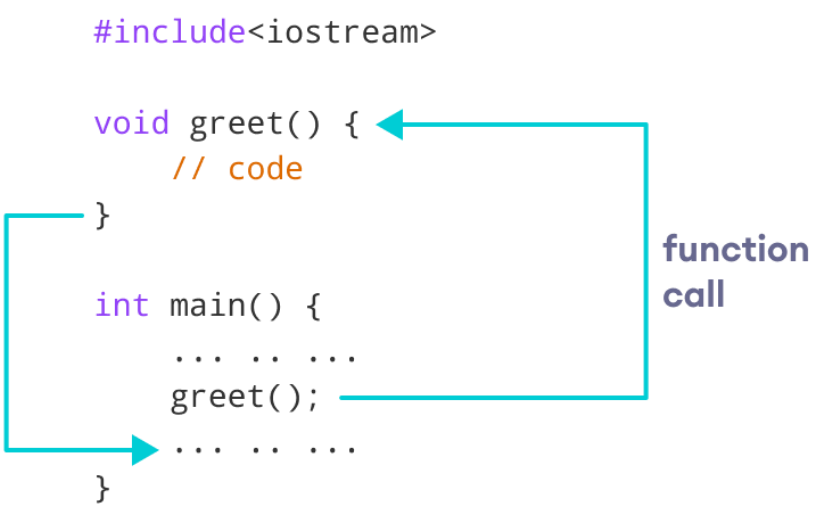
Here's an example of a function declaration.

```
// function declaration
void greet() {
    cout << "Hello World";
}
```

- the name of the function is greet()
- the return type of the function is void
- the empty parentheses mean it doesn't have any parameters
- the function body is written inside {}

Here's how we can call the above greet() function.

```
int main() {

   // calling a function
   greet();
}
```



Output

```
Hello there!
```

Function Parameters

As mentioned above, a function can be declared with parameters (arguments).

A parameter is a value that is passed when declaring a function.

For example, let us consider the function below:

```
void printNum(int num)
{
   cout << num;
}
```

```
int main() {
    int n = 7;
    // calling the function
    // n is passed to the function as argument
    printNum(n);

    return 0;
}
```

Example 1:Write C++ program to print two numbers(int and float) using function.

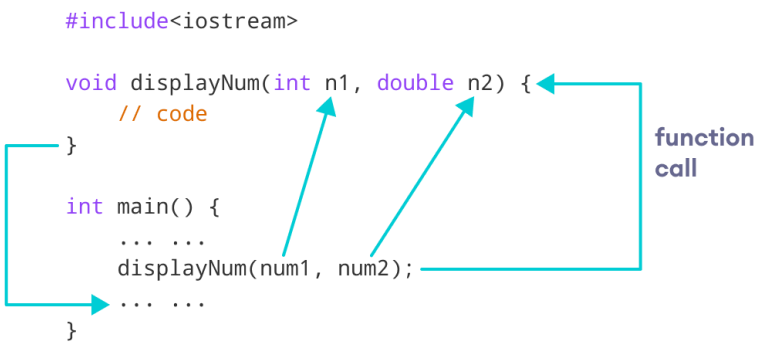
```
#include <iostream>
using namespace std;
// display a number
void displayNum(int n1, float n2) {
   cout << "The int number is " << n1<< endl;
   cout << "The double number is " << n2<< endl;
}

int main() {
    int num1 = 5;
    float num2 = 5.5;
   // calling the function
   displayNum(num1, num2);
   return 0;
}
```

Output

```
The int number is 5
The double number is 5.5
```

In the above program, we have used a function that has one int parameter and one float parameter.

We then pass num1 and num2 as arguments. These values are stored by the function parameters n1 and n2 respectively.



Example 2: Write C++ program to add two numbers using a function..

```
#include <iostream>
using namespace std;
// declaring a function
int add(int a, int b) {
    return (a + b);
}
int main() {
    int sum;

    // calling the function and storing
    // the returned value in sum
    sum = add(100, 78);
    cout << "100 + 78 = " << sum << endl;
    return 0;
}
```

Output

```
100 + 78 = 178
```

Example 3: Write C++ program to finds the maximum of two numbers using a function.

```
#include <iostream>
using namespace std;
// Function to find maximum
int findMax(int num1, int num2) {
   if (num1 > num2)
      return num1;
   else
      return num2;
```

```
}
int main() {
    int a = 5, b = 10;
    int maxNum = findMax(a, b); // Call the function
    cout << "The maximum number is: " << maxNum << endl;
    return 0;
}
```

Example 4: Write program to input person information and print it using structure and function

```
#include <iostream>
using namespace std;
struct Person {
    string first_name;
    string last_name;
    int age;
    float salary;
    // member function to display information about the person
    void display_info() {
        cout << "First Name: " << first_name << endl;
        cout << "Last Name: " << last_name << endl;
        cout << "Age: " << age << endl;
        cout << "Salary: " << salary << endl;
    }
};
int main() {
    Person p1;
    cout << "Enter first name: ";
    cin >> p1.first_name;
    cout << "Enter last name: ";
    cin >> p1.last_name;
    cout << "Enter age: ";
    cin >> p1.age;
    cout << "Enter salary: ";
    cin >> p1.salary;
    // display information using member function
    cout << "\nDisplaying Information." << endl;
    p1.display_info();
    return 0;
}
```

Output

```
Enter first name: Jane
Enter last name: Smith
Enter age: 27
Enter salary: 10000

Displaying
Information.
First Name: Jane
Last Name: Smith
Age: 27
Salary: 10000
```

H.W

Example: Write C++ program to Calculate the Area of a Circle using function.

Example: Write C++ program to Check if a Number is Even or Odd using function.

Example: Write C++ program to Find the Square of a Number using function.