LIVE STREAM

Classes and Objects in C++

Understanding the Fundamental Building Blocks of C++ Programming

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Understanding Classes and Objects in C++

In C++, **classes** and **objects** are fundamental concepts that form the backbone of object-oriented programming. They allow for the modeling of real-world entities and encapsulation of data and functions.

What is a Class?

A **class** in C++ is a blueprint for creating objects. It defines a data type by bundling data and methods that operate on the data into a single unit. A class outlines the properties and behaviors that its objects will have.

Key Features of a Class:

- **Data Members**: Variables that hold the data.
- **Member Functions**: Functions that define the behavior of the class.
- **Access Specifiers**: Keywords like public, private, and protected that control access to the class members.

Example of a Class in C++:

```
class Car {
public:
   // Data members
   string brand;
   string model;
   int year;

   // Member function
   void displayInfo() {
      cout << "Brand: " << brand << ", Model: " << model << ", Year: " << year << endl;
   }
};
```

In the example above, Car is a class with data members brand, model, and year, and a member function displayInfo.

What is an Object?

An **object** is an instance of a class. It is created from a class and can be used to access the data and functions defined in the class.

Creating an Object:

To create an object of a class, you simply declare a variable of the class type:

```
int main() {
   Car myCar; // Creating an object of class Car

   // Accessing data members and member function
   myCar.brand = "Toyota";
   myCar.model = "Corolla";
   myCar.year = 2020;
   myCar.displayInfo();

   return 0;
}
```

In this example, myCar is an object of the Car class. We access the data members and call the member function using the dot (.) operator.

Key Differences Between Class and Object

- **Class**: A template or blueprint for creating objects. It defines properties and methods.
- **Object**: An instance of a class. Objects hold actual values and can perform operations defined by their class.

Class in C++

- A class is a blueprint for creating objects.

Example of Creating and Using an Object:

```
#include <iostream>

using namespace std;

class Car {  // Class definition
public:
    string brand;
    int year;

    void display() {  // Member function
        cout << "Brand: " << brand << ", Year: " << year << endl;
    }
};
```

Object in C++

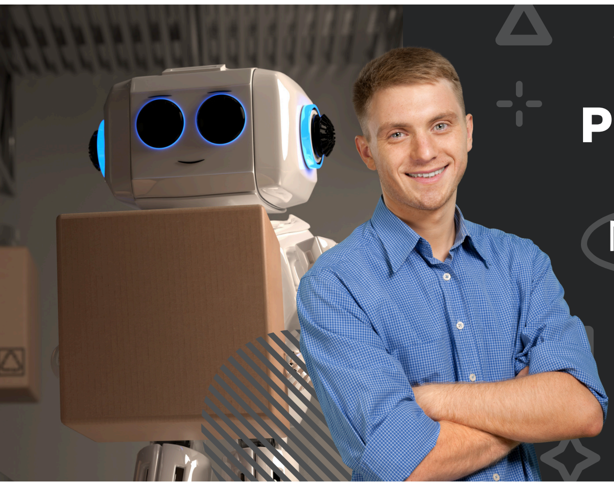
- An object is an instance of a class.

```
int main() {
    Car car1;  // Creating an object of class Car
    car1.brand = "Toyota";
    car1.year = 2023;

    car1.display();  // Calling member function
    return 0;
}
```

Output:

```
Brand: Toyota, Year: 2023
```



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