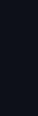
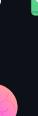
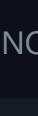


Understanding C++ Classes

-  What is a Class?
-  Syntax of a Class
-  Access Modifiers in C++
 - 1. `private`
 - 2. `public`
 - 3. `protected`
-  Example: A Simple `Car` Class
-  Summary Table

What is a Class?

A class in C++ is a user-defined data type that serves as a blueprint for creating **objects**. It encapsulates **member variables** (fields) and **member functions** (methods) that operate on the data, following the principles of **Object-Oriented Programming (OOP)**.

Syntax of a Class

NOTE: classes are usually declared in header files.

```
class ClassName {  
    private:  
        // Private data members  
  
    protected:  
        // Protected members  
  
    public:  
        // Public methods and constructors  
};
```

Access Modifiers in C++

Access modifiers control the **visibility** and **accessibility** of class members (variables and functions). C++ provides three main access specifiers:

1. `private`

- Default access level for class members.
- Members are **only accessible** within the class itself.
- Used to **encapsulate** and protect internal data.

```
class Example {  
    private:  
        int secret;  
  
    public:  
        void setSecret(int s) { secret = s; }  
        int getSecret() { return secret; }  
};
```

2. `public`

- Members are **accessible from outside** the class.
- Used to define the **interface** of the class.

```
class Example {  
    public:  
        int id;  
        void showID() { cout << "ID: " << id << endl; }  
};
```

3. `protected`

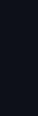
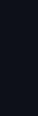
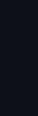
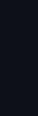
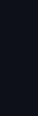
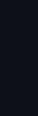
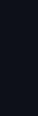
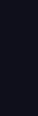
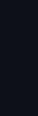
- Members are **not accessible** from outside the class.
- But they are accessible in **derived (child) classes**.
- Useful in **inheritance** scenarios.

```
class Base {  
    protected:  
        int value;  
};  
  
class Derived : public Base {  
    public:  
        void setValue(int v) { value = v; }  
        int getValue() { return value; }  
};
```

Example: A Simple `Car` Class

```
#include <iostream>  
using namespace std;  
  
class Car {  
    private:  
        string brand;  
        int year;  
  
    public:  
        Car(string b, int y) {  
            brand = b;  
            year = y;  
        }  
  
        void displayInfo() {  
            cout << "Brand: " << brand << ", Year: " << year << endl;  
        }  
};  
  
int main() {  
    Car car1("Toyota", 2020);  
    car1.displayInfo();  
  
    return 0;  
}
```

Summary Table

Access Modifier	Accessible Within Class	Accessible Outside Class	Accessible in Derived Class
<code>private</code>	 Yes	 No	 No
<code>protected</code>	 Yes	 No	 Yes
<code>public</code>	 Yes	 Yes	 Yes

Quiz!

Here's a short quiz on the topic: [quiz](#)

 Footer Separator

Markdown Viewer

How to view the markdown files in a browser...

- [Markdown Viewer](#)

Lecture Practices

Here are the lecture Practices...

- Day 7
- Day 8
- Day 9

Lecture Quizzes

Here are the lecture quizzes...

- Day 7
- Day 8
- Day 9

Weekly Topics

Here are the topics for the week...

- Classes
- Structs
- Fields
- Getters and Setters
- Constructors
- Instances
- Inheritance
- Polymorphism
- Pointers
- Upcasting
- Misc. Concepts
- 4 Pillars of OOP