Tutorial 37 - Inheritance Syntax & Visibility Mode in C++

Syntax for Derived Class

```
class {{derived-class-name}} : {{visibility-mode}} {{base-class-name}}
{
    class members/methods/etc...
};

```

Explanation of Syntax:

1. After `class`, write the **derived class name**.
2. Use a `:` to indicate inheritance.
3. Specify the **visibility mode** (`public`, `protected`, or `private`).
4. Follow with the **base class name**.

Notes on Visibility Modes:

1. **Default Visibility Mode**:
   - `private`, if not specified.
2. **Public Visibility Mode**:
   - Public members of the base class remain **public** in the derived class.
3. **Private Visibility Mode**:
   - Public members of the base class become **private** in the derived class.
4. **Private Members**:
   - Not inherited by the derived class.

Example Program

Code Snippet 1: Base and Derived Class

```
#include <iostream>
using namespace std;
// Base Class
class Employee {
public:
    int id;
    float salary;
    Employee(int inpId) {
        id = inpId;
        salary = 34.0;
    }
    Employee() {} // Default constructor
};
// Derived Class
class Programmer : public Employee {
public:
    int languageCode;
    Programmer(int inpId) {
        id = inpId; // Inherits 'id' from Employee
        languageCode = 9;
```

```
    }
    void getData() {
        cout << "ID: " << id << endl;
    }
};

```

Code Snippet 2: Main Program

```
int main() {
    Employee harry(1), rohan(2);
    cout << "Harry's Salary: " << harry.salary << endl;
    cout << "Rohan's Salary: " << rohan.salary << endl;
    Programmer skillF(10);
    cout << "Programmer's Language Code: " << skillF.languageCode << endl;
    cout << "Programmer's ID: " << skillF.id << endl;
    skillF.getData(); // Display ID using derived class function
    return 0;
}

```

Output Explanation

1. **Employee Objects**:
   - `harry` and `rohan` are created with IDs 1 and 2, respectively.
   - Their salaries (set to 34.0 by the constructor) are printed.
2. **Programmer Object**:
   - `skillF` is created with ID 10 and `languageCode` set to 9.
   - Prints `languageCode` and inherited `id`.
3. **Function Call**:
   - `getData()` prints the `id` of `skillF`.

Short Notes for Notebook

Inheritance Syntax

```
class Derived : visibility-mode Base {
    // Members/Methods
};

```

Visibility Modes:

1. **Public**:
   - Public → Public in derived class.
2. **Private**:
   - Public → Private in derived class.
3. **Default**:
   - Private, if not specified.
4. **Private Members**:
   - Not inherited.

Example:

```
class Employee {
public:
    int id;
    float salary;
};
class Programmer : public Employee {
    int languageCode;
};

```

Key Points:

- Use constructors for initialization.
- Derived class inherits public and protected members, not private ones.