Don Bosco Institute of Technology, Kurla(W)
Department of Electronics and Tele-Communication Engineering
ECL304 - Skill Lab: C++ and Java Programming
Sem III
2021-22

Lab Number:	**6**
Student Name:	**Russel D'mello**
Roll No :	**32**

Title:

1. To perform Multiple Inheritance in C++. Create a student class representing student roll number, name and branch and an exam class (derived class of student) representing the scores of the student in various subjects (maths, physics and chemistry) and sports class representing the score in sports. The sports and exam class isinherited by a result class which adds the exam marks and sports score to generate the final result.
2. To perform Hierarchical Inheritance in C++. Create an Employee class with attributes EmpID and EmpSalary. Also create necessary methods/constructors to accept these values from the user. Create classes permenantEmployee and TemporaryEmployee which will be derived classes of Employee. Mention hike attribute in these derived classes and calculate the total salary using generate_salary() method for respective types of employees. Objects of the derived classes should be created and salaries for the permanent and temporary employees should be calculated and displayed on the screen.

Learning Objective:

- Students will be able to perform multiple inheritance using C++.

Learning Outcome:

- Understanding the inheritance concept and reusability of the code.

Course Outcome:

ECL304.2	Comprehend building blocks of OOPs language, inheritance, package and interfaces

Theory:

- Explain in details about inheritance, its types, syntaxes and block diagrams in C++.

INHERITANCE

In C++, inheritance is a process in which one object acquires all the properties and behaviors of its parent object automatically. In such way, you can reuse, extend or modify the attributes and behaviors which are defined in other class.

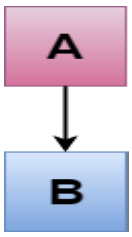
In C++, the class which inherits the members of another class is called derived class and the class whose members are inherited is called base class. The derived class is the specialized class for the base class.

TYPES

Single Inheritance

Single inheritance is defined as the inheritance in which a derived class is inherited from the only one base class.

BLOCK DIAGRAM



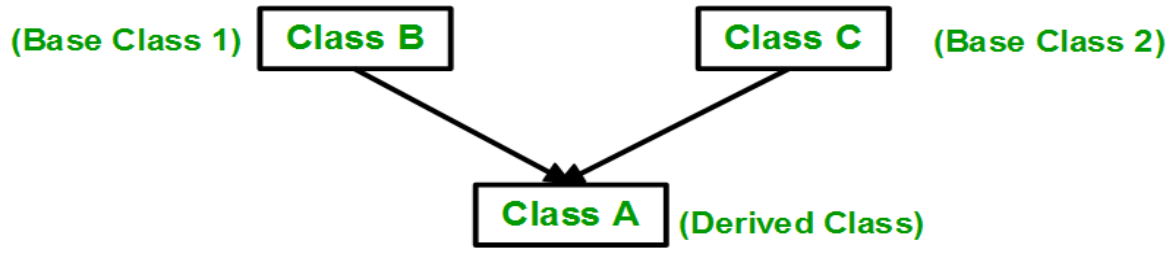
SYNTAX

```
class subclass_name : access_mode base_class
{
  //body of subclass
};
```

Multiple Inheritance

Multiple Inheritance is a feature of C++ where a class can inherit from more than one classes. i.e one sub class is inherited from more than one base classes.

BLOCK DIAGRAM



SYNTAX

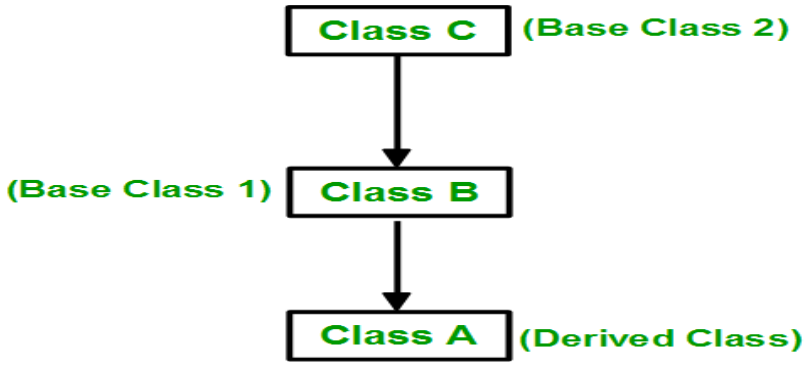
```
class subclass_name : access_mode base_class1, access_mode base_class2, ....
{
  //body of subclass
```

};

Multilevel Inheritance:

In this type of inheritance, a derived class is created from another derived class.

BLOCK DIAGRAM



SYNTAX

class A {

…….};

class B : public A {

……..};

class C : public B {

……..};

Hierarchical Inheritance:

In this type of inheritance, more than one sub class is inherited from a single base class. i.e. more than one derived class is created from a single base class.

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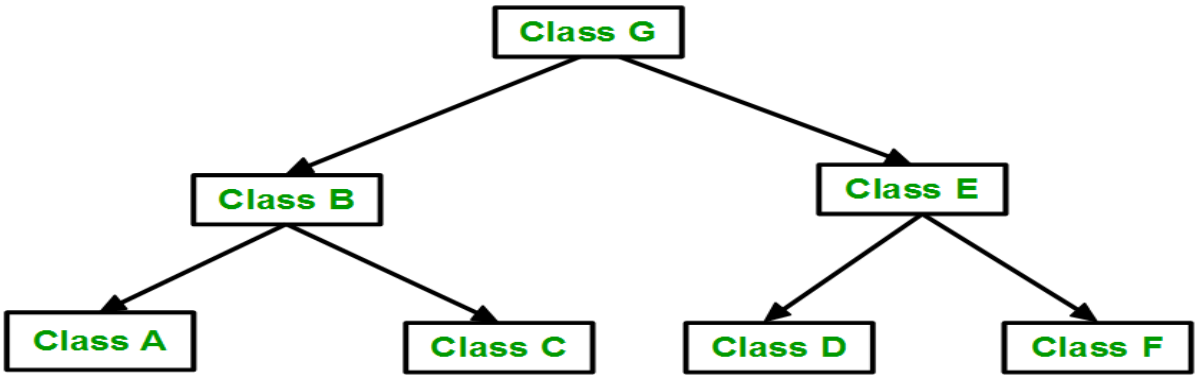


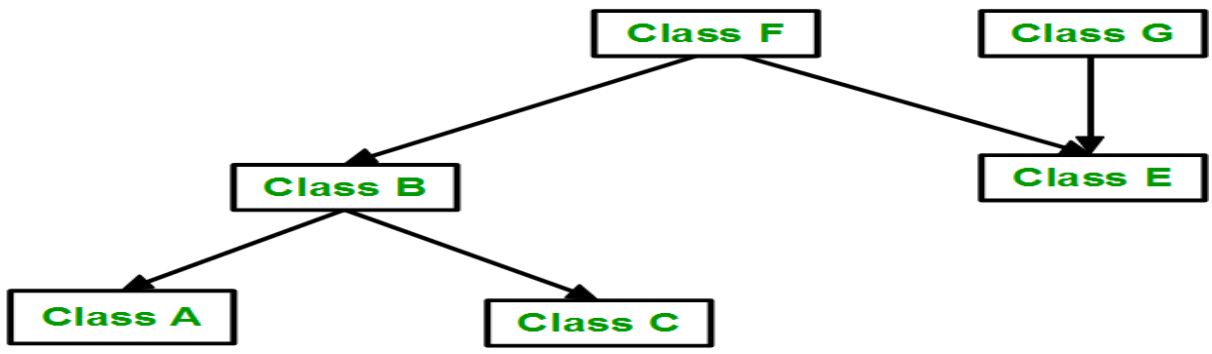
SYNTAX

```
class A // base class
{
   .............
};
class B : access_specifier A // derived class from A
{
   ...........
 } ;
 class C : access_specifier A // derived class from A
 {
   ...........
 } ;
 class D : access_specifier A // derived class from A
 {
    ...........
 } ;
```

Hybrid Inheritance:

Hybrid Inheritance is implemented by combining more than one type of inheritance. For example: Combining Hierarchical inheritance and Multiple Inheritance.

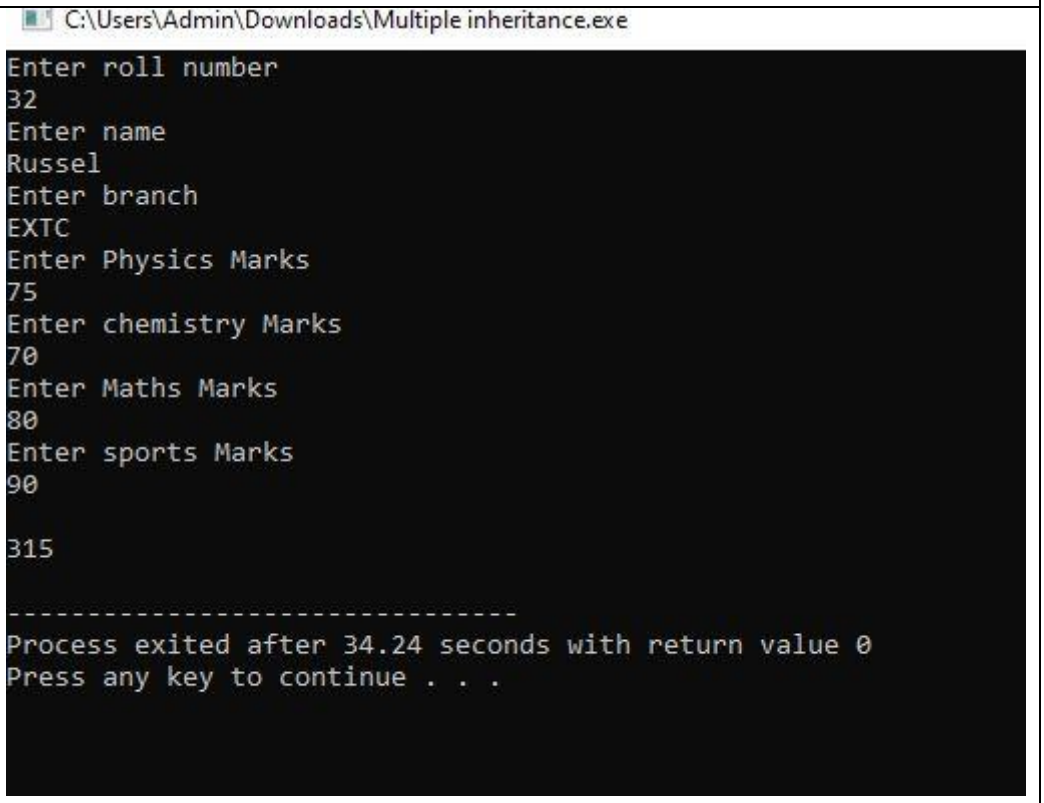
BLOCK DIAGRAM:



SYNTAX:

```
class A
{
    .....
};
class B : public A
{
    .....
} ;
class C
{
    .....
};
 class D : public B, public C
{
    .....
}
```

Algorithm:	Step1: start Step2: Declare base class student Step3: int roll no, string name, string branch Step4: Get input from the user Step5: Create multiple inheritance Step6: int maths, physics, chem Step7: Get input from user Step8: Create class sports Step9: int sports

	Step10: Get the value Step11: Add sports and exam class isinherited by a result class Step12:Result Step13: Stop
Program:	https://github.com/russ070/Skill-lab-with-OOPM/blob/main/32_Lab6.1.cpp
Input given:	32 Russel 75,70,80,90
Output Screenshot:	

Algorithm :	
Program:	

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Input given:	
Output Screenshot:	

Faculty: Ms. Deepali Kayande