

**Self-Assessment Report**

**Inheritance**

**BS Computer Science**

**Object Oriented Programming**

**2nd Semester**

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1. **Single inheritance:**

The inheritance in which a single derived class is inherited from a single base class is known as Single Inheritance.

Syntax: child class: access specifiers parent class

1. Public:

In single inheritance when we inherit a class and set its access specifier public, we can access all the data members in the child class, class, and object. In the code, I have used three access specifiers for data members public, private, and protected. Private access specifiers can not be called in object and child classes. Private access specifiers can only be called in class so to access private specifiers we use functions getter and setter (Setter is used to set values and the getter is used to get the values). Protected can be called in class and child class.

1. Private:

In single inheritance when we inherit a class and set its access specifier private, we cannot access data members of the parent class in the child class. Private can only be accessible in a class and cannot access able an in-drive class or in an object. In this modifier, I have used three access specifiers for data members public, private, and protected but they cannot be accessed in the child class because of the private modifier when we inherit the class. protected inheritance makes the public and protected members of the base class protected in the derived class.

1. Protected:

In single inheritance when we inherit a class and set its access specifier protected. We cannot access data members of the parent class in the child class. By using the specifier our inherit class becomes protected. private inheritance makes the public and protected members of the base class private in the derived class.

1. **Multiple inheritances:**

Deriving a class from more than one direct base class is called multiple inheritances**.**

1. Public:

In multiple inheritances when we inherit a class and set its access specifier public, we can access all the data members in the child class, class, and object. In the code, I have used three access specifiers for data members public, private, and protected. Private access specifiers cannot be called in object and child classes. Private access specifiers can only be called in class so to access private specifiers we use functions getter and setter (Setter is used to set values and the getter is used to get the values). Protected can be called in class and child class. In multiple inheritances, we can inherit more than one child class with a single-parent class.

1. Private:

In multiple inheritances, we can inherit more than one child class with a single-parent class. Multiple child classes are driven by single-parent classes. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.

1. Protected:

Multiple child classes are driven by single-parent classes. When we inherit a child class and set its modifier protected, makes all the data member in the parent class protected which mean we cannot access all the data member in a derived class.

1. **Multi-level:**

The multi-level inheritance includes the involvement of at least two or more two classes.

1. Public:

In multi-level inheritance when we inherit a class and set its access specifier public, we can access all the data members in the child class, class, and object. In the code, I have used three access specifiers for data members public, private, and protected. Private access specifiers cannot be called in object and child classes. Private access specifiers can only be called in class so to access private specifiers we use functions getter and setter (Setter is used to set values and the getter is used to get the values). Protected can be called in class and child class. In multiple inheritances, we can inherit more than one child class with a single-parent class.

1. Private:

In multi-level inheritances, we can inherit more than one child class with a single-parent class but the second child class is inherited by the first child class. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.

1. Protected:

There are multi-level child classes that are driven by single-parent classes and have multiple child classes. When we inherit a child class and set its modifier protected, makes all the data member in the parent class protected which mean we cannot access all the data member in a derived class.

1. **Hierarchical inheritance:**

A single base class can have multiple derived classes, and other subclasses can further inherit these derived classes, forming a hierarchy of classes.

1. Public:

In hierarchical inheritances, we can inherit more than one child class and sub-class with a single-parent class the sub-child class is inherited by the child class. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.

1. Private:

In hierarchical inheritances, we can inherit more than one child class with a single-parent class but the sub-child class is inherited by the child class. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.

1. Protected:

In hierarchical inheritances, we can inherit more than one child class with a single-parent class but the sub-child class is inherited by the child class. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.

1. **Hybrid inheritance:**

The process by which a sub-class follows multiple types of inheritance while deriving properties from the base or super class.

1. Public:

In hybrid inheritances, we can inherit more than one child class and class with a multiple-parent class the child class is inherited by the parent class. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.

1. Private:

In hybrid inheritances, we can inherit more than one child class with a multiple-parent class but the child class is inherited by the parent class. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.

1. Protected:

In hybrid inheritances, we can inherit more than one child class with a multiple-parent class but the child class is inherited by the parent class. When we inherit a child class and set its modifier private, makes all the data member in the parent class private which mean we cannot access all the data member in a derived class.