International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 01 | January - 2023 Impact Factor: 7.185 ISSN: 2582-3930

Inheritance and its Type in Object Oriented Programming Using C++

Aarya Pate, Pradnya Jadhav, Akshit Shah
KJ SOMAIYA POLYTECHNIC
Department of Computer Engineering, Vidyavihar,Mumbai

ABSTRACT

The objectiveof this review paper is to review concept of inheritance in C++ programming language.C++ is a general-purpose programming language with an influence towards system programmingthat supports efficient low-level computations,data abstraction,object oriented programming and generic programming. Programming is a fundamental course that is taught to every computer science during their initial semesters.The course introduces students to basics operations and architecture of computers, and also polishes the problem solving skills of students. The review paper begins upon the survey of C++ OOP's concept like inheritance,programming language and language technical concepts using examples to provide the reader's a feel for the language.Inheritance plays an important rule for code reusability.

INTRODUCTION

Reusability is an important feature of OOP.It is always nice if we could reuse something that already exists ratherthan trying to create the same all over again. The reuse of a class that has already been tested, debugged and used many times can save us the effort and time of developing and testing the same again.

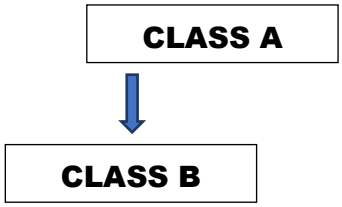
C++ strongly supports the concept of reusability. The C++ classes can be reused in several ways. Once a class has been written and tested,it can be adapted by other programmers to suit their requirements. This is basically done by creating new classes,reusing the properties of the existing ones. The mechanism of deriving a new class from an old one is call inheritance (or derivation). The old class is referred to as the base class and the new one is called the derived class or subclass.The derived class inherits some or all of the traits from the base class.

TYPES OF INHERITANCE:

- SINGLE INHERITANCE
- MULTILEVEL INHERITANCE
- MULTIPLE INHERITANCE
- HIERARCHICAL INHERITANCE
- HYBRID INHERITANCE

SINGLE INHERITANCE:

Single inheritance is the mechanism of deriving a class from only one single base class.
It allows a derived class to inherit the properties of a base class, thus enabling code reusability as well as adding new features to the existing code.



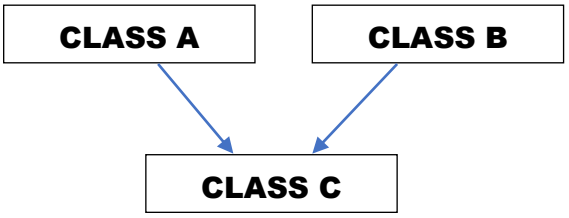
(BASE CLASS)

(DERIVED CLASS)

MULTIPLE INHERITANCE:

Derived class with several base classes is called multiple inheritance.
Multiple inheritance is complex as compared to multilevel inheritance and not widely used.

(BASE CLASS)



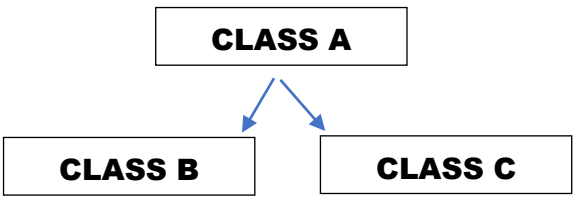
(BASE CLASS)

(DERIVED CLASS)

HIERARCHICAL INHERITANCE:

The traits of one class may be inherited by more than one class. This process is known as hierarchical inheritance.

(BASE CLASS)

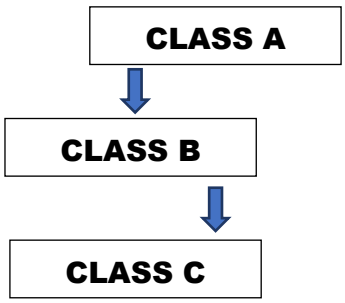


(DERIVED CLASS)

(DERIVED CLASS)

MULTILEVEL INHERITANCE:

The mechanism of deriving a class from another 'derived class' is known as multilevel inheritance**.**



(BASE CLASS)

(INTERMEDIATEBASE CLASS)

(DERIVED CLASS)

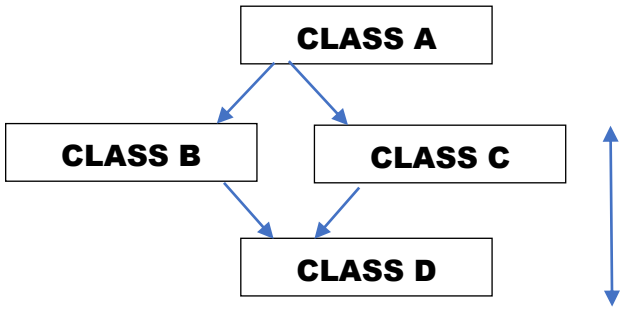
HYBRID INHERITANCE:

The mechanism of combining various types of inheritance like hierarchical, multiple etc. is known as hybrid inheritance.

hierarchical

inheritance

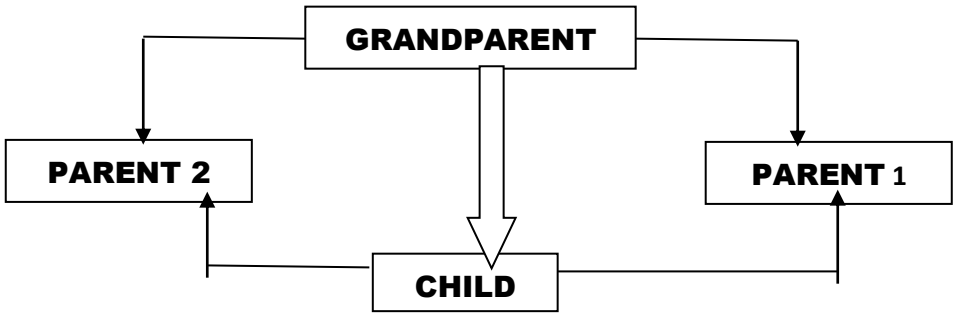
multiple



inheritance

Virtual base classes

Virtual classes are primarily used during multiple inheritance. To avoid, multiple instances of the same class being taken to the same class which later causes ambiguity, virtual classes are used.



The advantages of Inheritance:

- Makes real world representation of problems easier
- Since, problems are now modularized, solving takes lesser time.
- Improves data security by the use of protected keyword.
- Makes code simpler to understand and implement

The disadvantages of inheritance :

- Adds extra memory overload for the compiler as it will have to keep records of the parent as well as the child class

Applications of Inheritance in C++

- It saves memory space and time.
- It is used to correlate two or more classes.
- It will remove frustration,improve the performance and increase the reliability of code.
- Code reusability.

Limitation of Inheritance in C++

- Over use of inheritance in a program can make it more complex.
- Multiple inheritance can create ambiguity between attributes and operation .
- Also multiple inheritance can increase the likehood of errors.

Conclusion

Thus we have seen Inheritance is a process that allows the new objects to take on the attributes and properties of existing parent objects. Therefore, it increases code reusability and allows the programmers to alter the properties of data members and member functions defined in other classes.

Syntax:

```
Class derived-class-name : visibility-mode base-class-name
{
   ……//
   ……// members of derived class
   ……//
}
```

Reference:

E.BALAGURUSWAMY,
The contents of the book are designed in such a way that a beginner can easily start from there and then gradually achieve more understanding of the language from the later topics.