

OOPS CONCEPTS IN C++

Object oriented programming is a way of solving complex problems by breaking them into smaller problems using objects. Before Object Oriented Programming, programs were written in procedural language, they were nothing but a long list of instructions. On the other hand, the OOP is all about creating objects that can interact with each other, this makes it easier to develop programs in OOP as we can understand the relationship between them.

Main features of Object-Oriented Programming in C++:

- Object
- Class
- Abstraction
- Encapsulation
- Inheritance
- Polymorphism
- Genericity

Object

Object is the basic unit of OOP. They are instances of class, which have data members and uses various member functions to perform tasks.

Class

Class is basically a blueprint for object. It declares & defines what data variable of the object will have and what operations can be performed on the object of class.

Abstraction

Abstraction is the process of separating necessary things from unnecessary things. Abstraction refers to showing only the essential features of the application and hiding the details.

Encapsulation

It is a process of combining data and function into a single unit like capsule. Encapsulation is all about binding the data variables and functions together in class.

Inheritance

Inheritance is a feature using which an object of child class acquires the properties of parent class. The outcome of Inheritance is called reusability. This is a very important concept of object-oriented programming since this feature helps to reduce the code size.

Polymorphism

It is a feature, which lets us create functions with same name but different arguments, which will perform different actions. That means, functions with same name, but functioning in different ways.

Genericity

This feature allows declaration of variables without specifying exact data types. The compiler identifies the data types at run time. The template feature in c++ allows generic programming.

Advantages of OOP:

- ***Re-usability***
- ***Data Redundancy***
- ***Code Maintenance***
- ***Security***
- ***Design Benefits***
- ***Better productivity***
- ***Polymorphism Flexibility***
- ***Problems solving***

INTRODUCTION OF C++

C++ was developed by Bjarne Stroustrup starting in 1979 at Bell Labs in Murray Hill, New Jersey, as an enhancement to the C language and originally named C with Classes but later it was renamed C++ in 1983.

C++ is a superset of C, and that virtually any legal C program is a legal C++ program.

C++ is a statically typed, compiled, general-purpose, case-sensitive, free-form programming language that supports procedural, object-oriented, and generic programming.

C++ FEATURES

- Simple
- Machine Independent or Portable
- Mid-level programming language
- Structured programming language
- Rich Library
- Fast Speed
- Recursion
- Object Oriented
- Compiler based

Simple

C++ is a simple language in the sense that it provides structured approach (to break the problem into parts), rich set of library functions, data types etc.

Machine Independent or Portable

Unlike assembly language, c programs can be executed in many machines with little bit or no change. But it is not platform-independent.

Mid-level programming language

C++ is also used to do low level programming. It is used to develop system applications such as kernel, driver etc. It also supports the feature of high level language. That is why it is known as mid-level language.

Structured programming language

C++ is a structured programming language in the sense that we can break the program into parts using functions. So, it is easy to understand and modify.

Rich Library

C++ provides a lot of in built functions that makes the development fast.

Fast Speed

The compilation and execution time of C++ language is fast.

Recursion

In C++, we can call the function within the function. It provides code reusability for every function.

Object Oriented

C++ is object oriented programming language. OOPs makes development and maintenance easier where as in Procedure-oriented programming language it is not easy to manage if code grows as project size grows.

Compiler based

C++ is a compiler based programming language, it means without compilation no C++ program can be executed. First we need to compile our program using compiler and then we can execute our program.

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