

LECTURE- I

OBJECT ORIENTED PROGRAMMING C++

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WHAT IS OBJECT ORIENTED PROGRAMMING (OOP)

- Object-Oriented Programming” was coined by **Alan Kay** in 1966 or 1967
- OOP is a programming paradigm based on the concept of "**objects**", which may contain **attributes** and **methods**. Examples, **C++**, Java, Python etc.
- **C++** is a **programming language** developed by Bjarne Stroustrup in 1979 at Bell Labs.
- **C++** is regarded as a **middle-level language**.

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ADVANTAGES OF OOP

- OOP models complex projects
- OOP code is reusable
- OOP prevents duplicating code
- OOP makes fixing bugs easier. Fixing an error contained in a well-structured class is easier than finding the error in multiple places in code.
- OOP protects information through encapsulation and Abstraction Object's data can only be accessed through public properties and methods and complex things make hidden.
- OOP is easy to work with in a team of developers

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FEATURES OF OOP

- **Object:** It is the basic unit of OOP. Data and methods are bundled into an object. It is also called the instance of a class.
- **Class:** It is the blueprint of an object. A class consists of member variable and member functions.
- **Inheritance:** child classes inherit attributes and code from parent classes
- **Encapsulation:** only exposing selected information to the outside world
- **Abstraction:** creating a simple model that represents the complex data & behaviors
- **Polymorphism:** when multiple objects can implement the same functionality

SOME MORE FEATURES...

- Friend function
- Friend class
- Constructor
- Destructor
- Virtual Function
- Pure Virtual Function

DIFFERENCES BETWEEN STRUCTURED PROGRAMMING AND OOP

Procedure Oriented Programming		Object Oriented Programming
Divided Into	In POP, program is divided into small parts called functions .	In OOP, program is divided into parts called objects .
Importance	In POP, Importance is not given to data but to functions as well as sequence of actions to be done.	In OOP, Importance is given to the data rather than procedures or functions because it works as a real world .
Approach	POP follows Top Down approach .	OOP follows Bottom Up approach .
Access Specifiers	POP does not have any access specifier.	OOP has access specifiers named Public, Private, Protected , etc.
Data Moving	In POP, Data can move freely from function to function in the system.	In OOP, objects can move and communicate with each other through member functions.
Expansion	To add new data and function in POP is not so easy.	OOP provides an easy way to add new data and function.
Data Access	In POP, Most function uses Global data for sharing that can be accessed freely from function to function in the system.	In OOP, data can not move easily from function to function, it can be kept public or private so we can control the access of data.
Data Hiding	POP does not have any proper way for hiding data so it is less secure .	OOP provides Data Hiding so provides more security .
Overloading	In POP, Overloading is not possible.	In OOP, overloading is possible in the form of Function Overloading and Operator Overloading .
Examples	Example of POP are : C, VB, FORTRAN, Pascal.	Example of OOP are : C++, JAVA, VB.NET, C#.NET.

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QUESTION & ANSWER

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NEXT LECTURE

- Before Lecture 2 you will revise LOOPS, CONDITIONAL STATEMENTS, BREAK, LABEL
- Revision of Lecture I
- New topic: Class, Object, Access Specifier, Some examples.