

**Class....11**

**Subject.... Computer Science**

**Chapter.... General OOP Concepts**

This chapter introduces the general OOP concepts that the traditional languages like C, Pascal, COBOL and BASIC lack. Before starting the lesson let us discuss how software has evolved to the present day.

A program is a command or a set of instructions given to a computer in a programming language to solve a particular problem. There are two major programming languages... low level languages and high level languages.

Low level languages... (Machine language written in binary digits 0 and 1) and (Assembly language written in symbolic names) are machine dependent languages which require extensive knowledge of the computer architecture making it very difficult for the programmer.

High level languages are written in English like keywords making it easier for the programmer. However, since the computer understand only binary digits these needs to be converted to machine language using language translators like compiler or interpreter.

Conventional programming using high level languages such as BASIC, COBOL, FORTAN, C etc. are commonly known as Procedure Oriented Programming (POP). Here, the emphasis is on functions rather than data items leading to its major drawback. The next advancement in software development is Object Oriented Programming (OOP). Some of the OOP languages are C++, Java, Python, Simula67 etc.

In contrast to POP, the object oriented programming languages does not allow data to move freely from one function to another. Rather, the complete program is decomposed into a number of entities called objects.

Object is an identifiable entity having characteristics and behaviour. For example, let us considered a Potato. We can say potato is an object. It's characteristics are it is brown in colour, it is spherical or oval in shape. It possesses some behaviour

like it is used to make vegetables, used to make chips etc. Hence, characteristics of an object are the data and behaviour are the functions.

Now, let us understand a very important term used in OOP.....class

A class is a group of objects that share common properties. For example, we can say FRUIT is a class with many different objects like apple, mango, orange, banana etc. Each object has a different set of attributes but the behaviour is same, i.e., used to make fruit salad, healthy food, tasty to eat etc. Thus, we can say that class is an object factory whereas objects are instance of a class.

Let us now consider some basic concepts of object-oriented programming which are used to overcome the drawbacks or shortcoming of conventional programming approaches.

The general concepts of OOP are...

1. Abstraction.. It refers to the act of representing the essential features without including the background details.
2. Encapsulation.. The wrapping up of data and functions into a single unit is called Encapsulation.
3. Modularity.. It is the property of a system that has been decomposed into a set of cohesive and loosely coupled modules.
4. Polymorphism.. It is the process of using a function for more than one purposes.
5. Inheritance... It is the capability of one class of things to inherit capabilities or properties from another class.

Please refer to the link given below to find a detailed discussion on these topics.