CSE 1203 (Object-oriented Programming)

Chapter 1

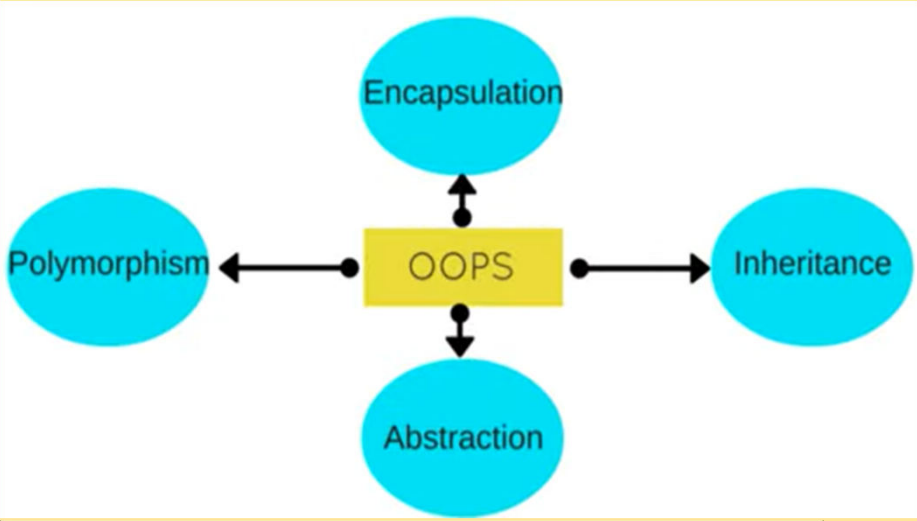
Introduction to OOP

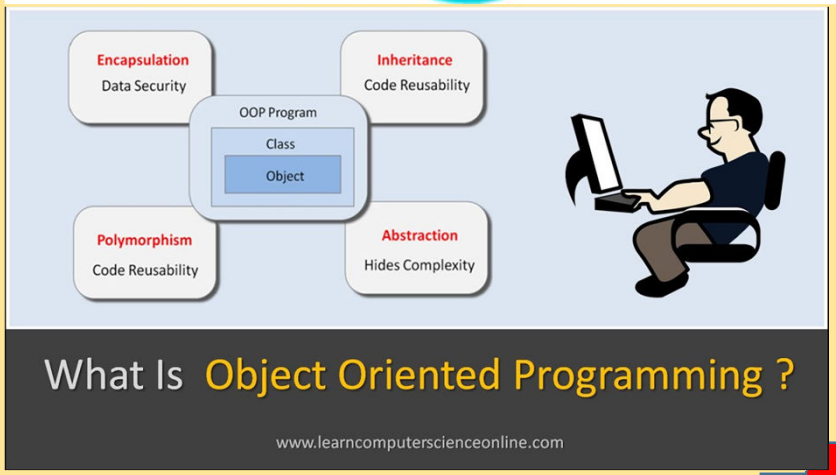
Introduction to OOP

- **Object Oriented Programming(OOP)** is a programming technique in which programs are written on the basis of objects.
- An Object is a collection of data and functions.
- Object represent a person, place or thing in real world.
- In oop data and all possible function on data are grouped together.

Definition of OOP

- **Object Oriented programming** is a programming style that is associated with the concept of Class, Objects and various other concepts revolving around these two, like Inheritance, Polymorphism, Abstraction, Encapsulation etc.
- Object oriented programming aims to implement real world entities like inheritance, hiding, polymorphism etc in programming.
- The main aim of OOP is to bind together the data and the functions that operates on them so that no other part of code can access this data except that function.





OOP Facts

Features of OOP

- Object
- Classes
- Real World Modeling
- Reusability
- Information hiding
- Polymorphism

- Object Oriented programming Language are

✓C++

✓Java

✓C#

✓PHP

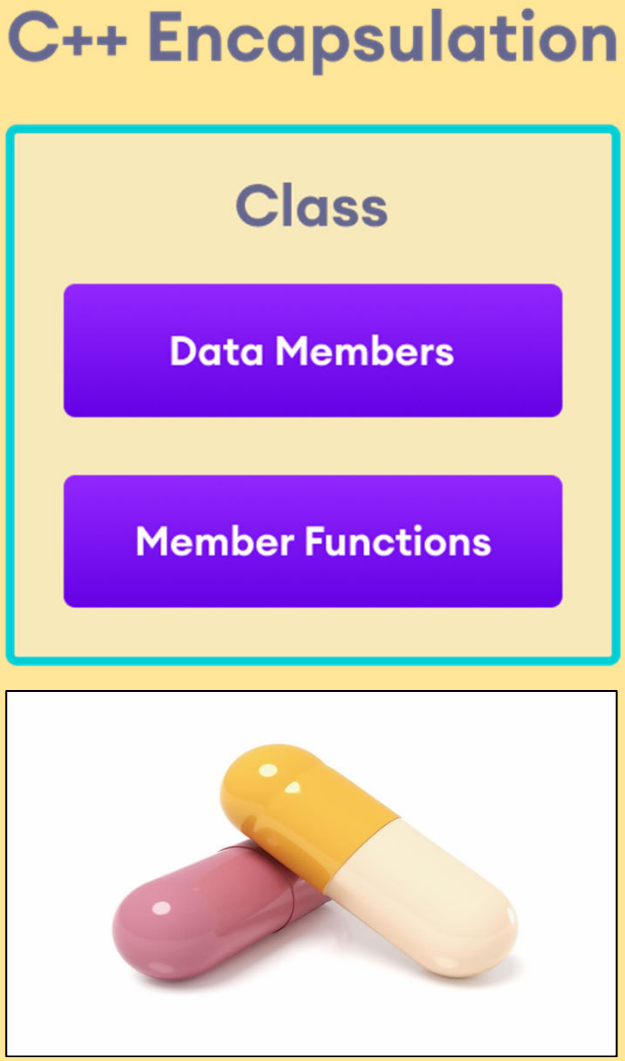
OOP Principles : **Encapsulation**

1. Encapsulation

Encapsulation is one of the key features of object-oriented programming. It involves the bundling of data members and functions inside a single unit called class.

Example:

- Take an example of a pharmacy
- You go to the shop and ask for a medicine
- There only the chemist has the access to the store who knows what medicine to give you
- This reduces the risk of taking wrong medicine
- Here medicines are data and chemist is member function reside in same place. You are the external piece of code



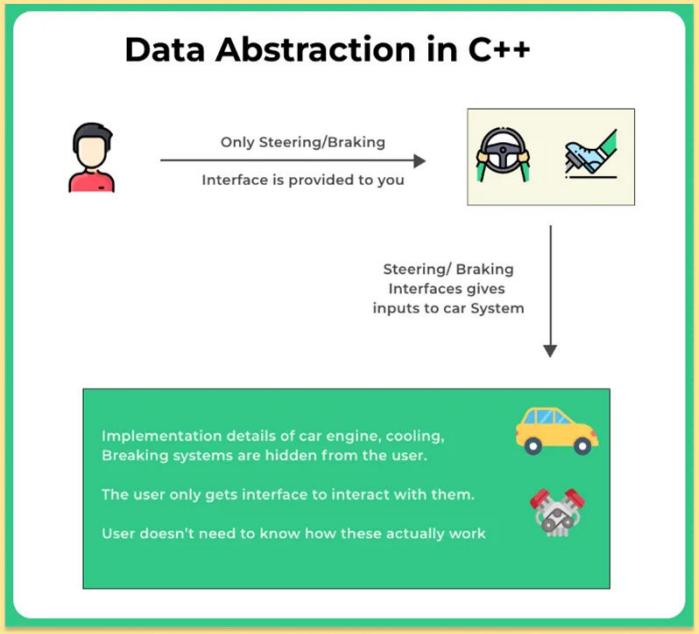
OOP Principles : **Abstraction**

2. Abstraction

Data abstraction is one of the most essential and important features of object-oriented programming in C++. Abstraction means displaying only essential information and hiding the details.

Example:

- Take an example of your laptop
- When you press a key on your keyword a character is displayed in the screen
- You do not need to know the details how the character is displyed



Data Encapsulation vs Data Abstraction

Abstraction is a process of extracting important information without involving the complete detail of the system. On the other hand, data hiding is a process of wrapping the data in a single unit, i.e., to achieve data encapsulation

OOP Principles : **Inheritance**

3. Inheritance

The capability of a class derive properties and characteristics from another class is called **Inheritance**. Inheritance is one of the most important features of Object-Oriented Programming.

Example:

- For example a child inherits the traits of his/her parents
- When you press a key on your keyword a character is displayed in the screen
- You do not need to know the details how the character is displyed

Types of Classes based on Inheritance

1. **Sub Class:** The class that inherits properties from another class is called Subclass or Derived Class or Child Class.
2. **Super Class:** The class whose properties are inherited by a subclass is called Base Class or Superclass or Parent Class.

OOP Principles : **Polymorphism**

4. Polymorphism

The word “polymorphism” means having many forms.. It’s a Greek words (poly+morphs).

Example:

- A real-life example of polymorphism is a person who at the same time can have different characteristics. A man at the same time is a father, a son, and a player. So the same person exhibits different behavior in different situations. This is called polymorphism. Polymorphism is considered one of the important features of Object-Oriented Programming.

End