Advanced C++

What is C++ and Purpose?

The **prime purpose** of C++ programming was to **add object orientation to the C programming language**, which is in itself one of the most powerful programming languages.

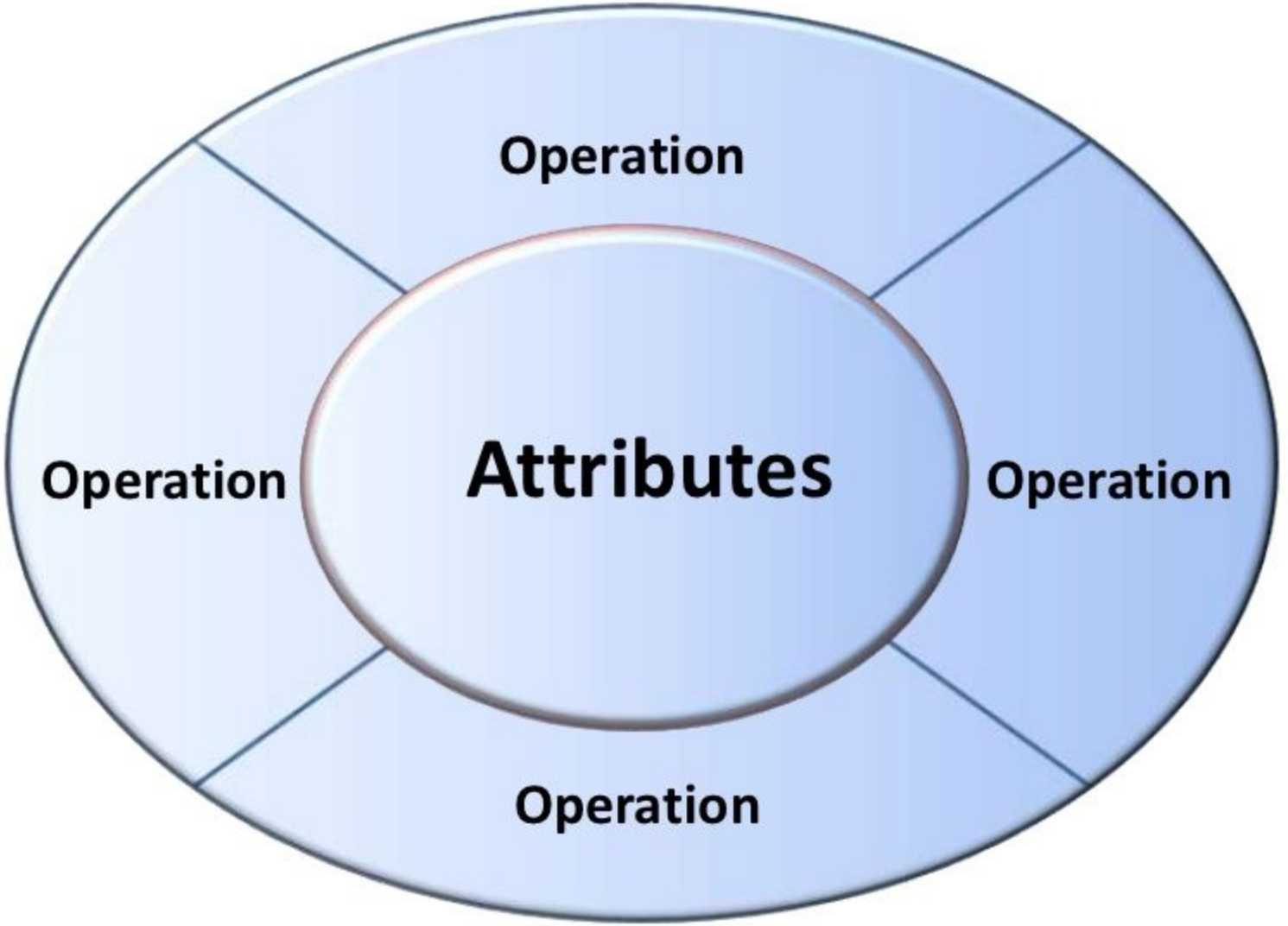
There are a **few principle concepts** that **form the foundation of object-oriented programming:**

1. Class
2. Object
3. Abstraction
4. Encapsulation
5. Inheritance
6. Polymorphism

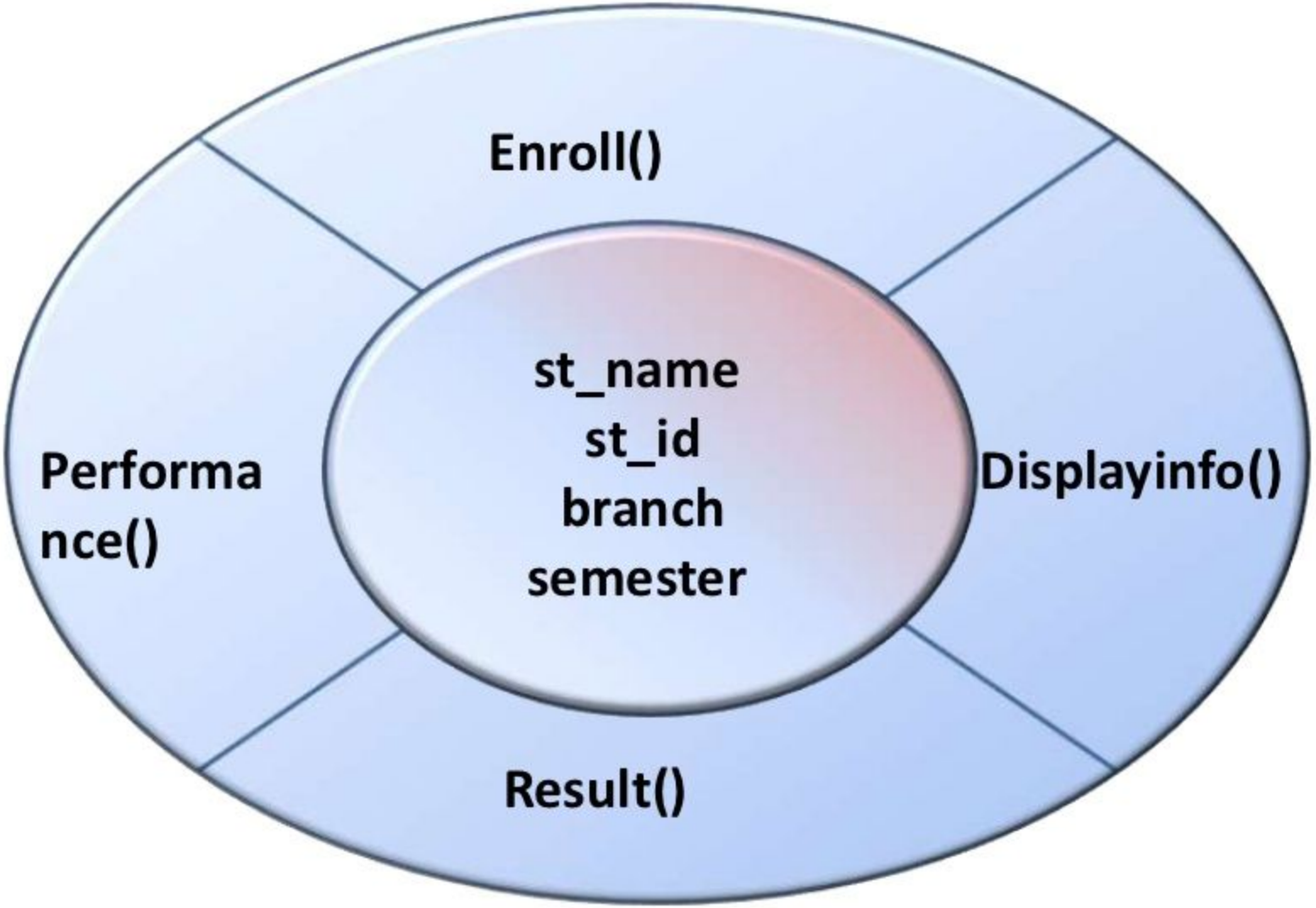
Object :-

- This is the basic **unit** of object oriented programming.
- That is **both data and function that operate on data** are bundled as a unit called as object.
- It is an **instance** of **Class**

Object

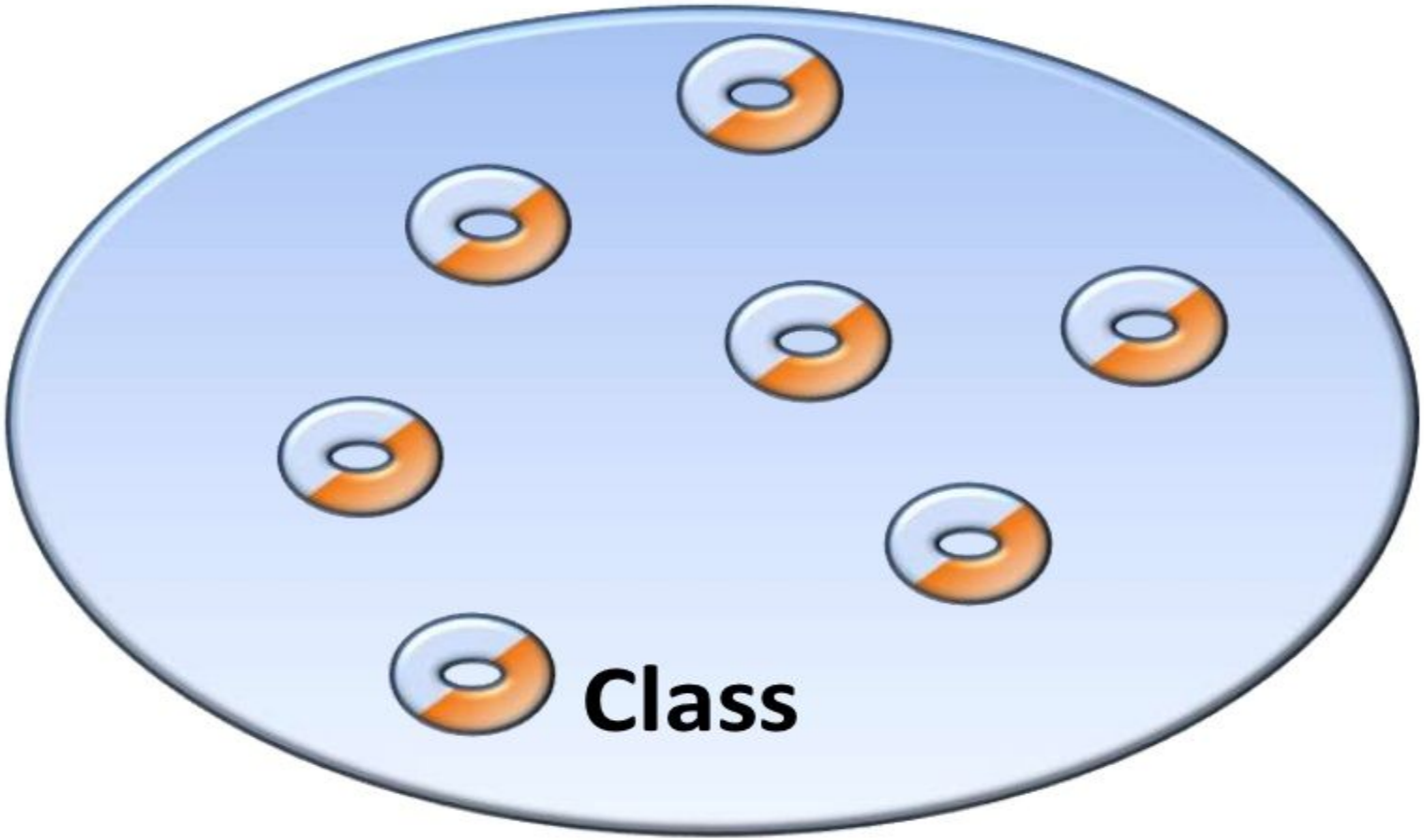


Example: StudentObject



Class

- Class is a collection of **similar objects**.



- When you define a class, you define a **blueprint for an object.**

- This doesn't actually define any data, but it does define what the class name means, that is, what an object of the class will consist of and what operations can be performed on such an object.

Abstraction

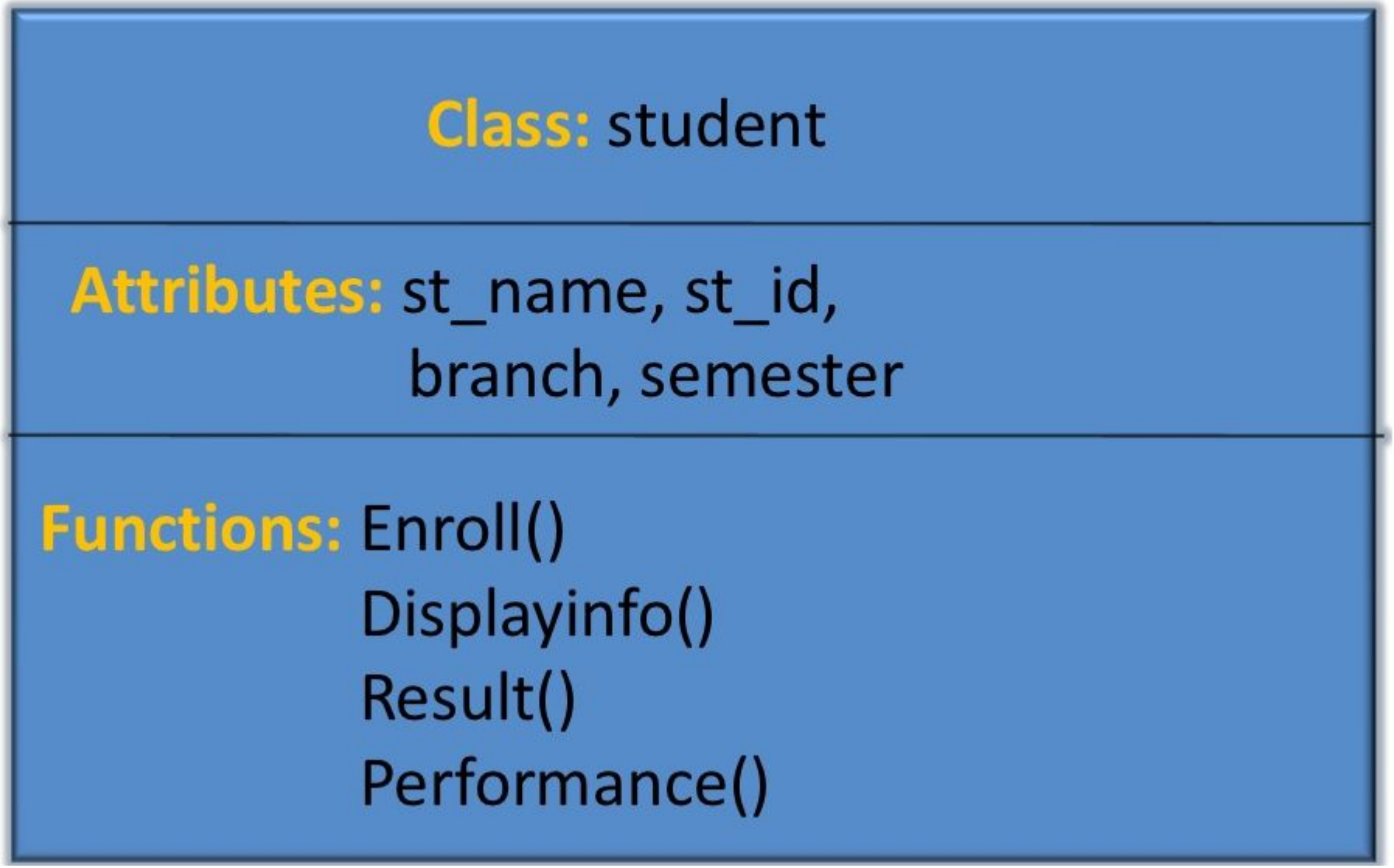
Data abstraction refers to, providing only essential information to the outside world and hiding their background details, i.e., to represent the needed information in program without presenting the details.

For example, C++ classes provides different methods to the outside world without giving internal detail about those methods and data.

Encapsulation

"Mechanism that associates the **code** and the **data** it manipulates into a single unit and keeps them safe from external interference and misuse."

Encapsulation



Inheritance

- One of the most useful aspects of object-oriented programming is code **reusability**.
- Inheritance is the **process of forming a new class from an existing class** that is from the existing class called as **base class**, new class is formed called as **derived class.**

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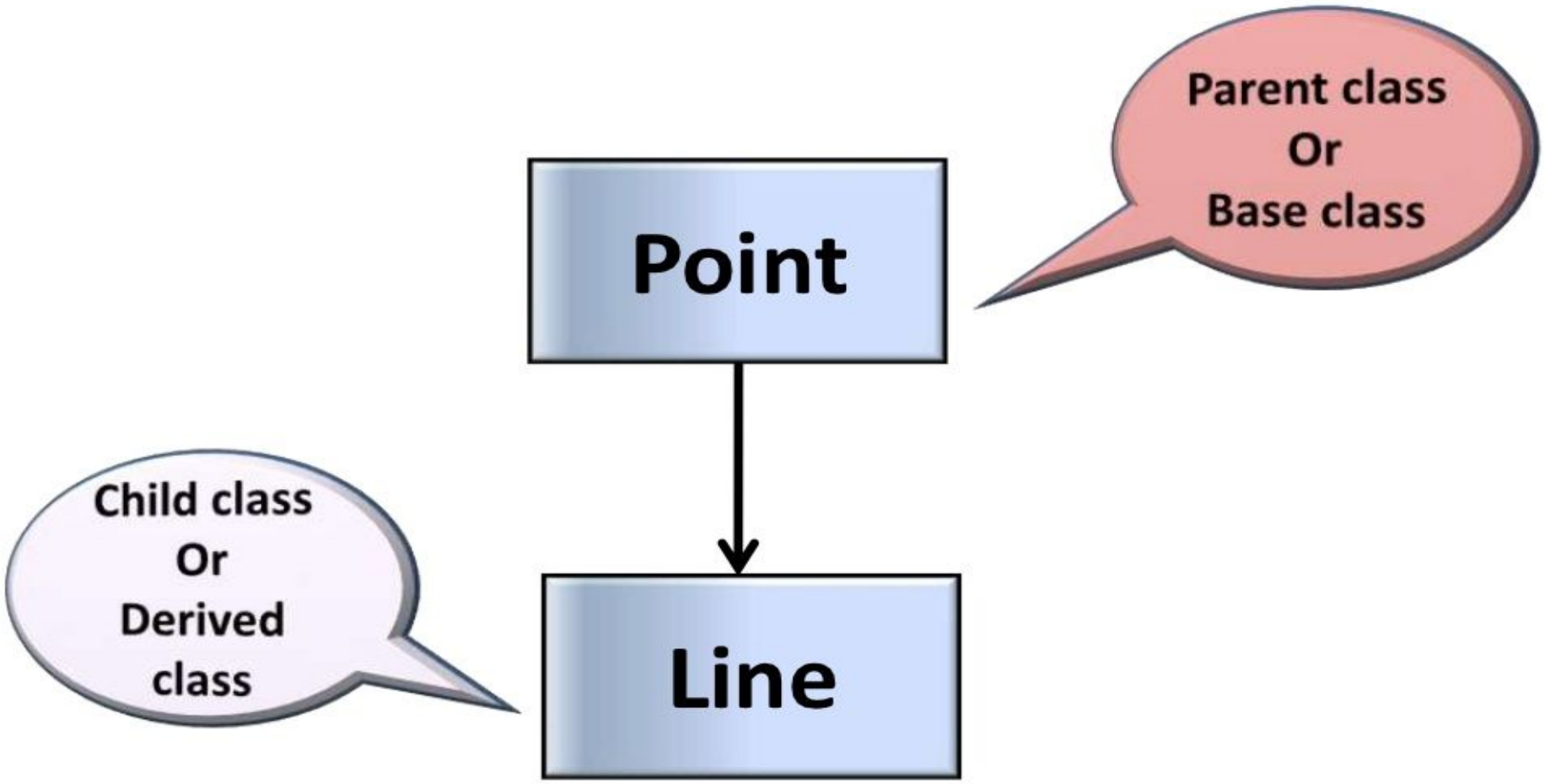
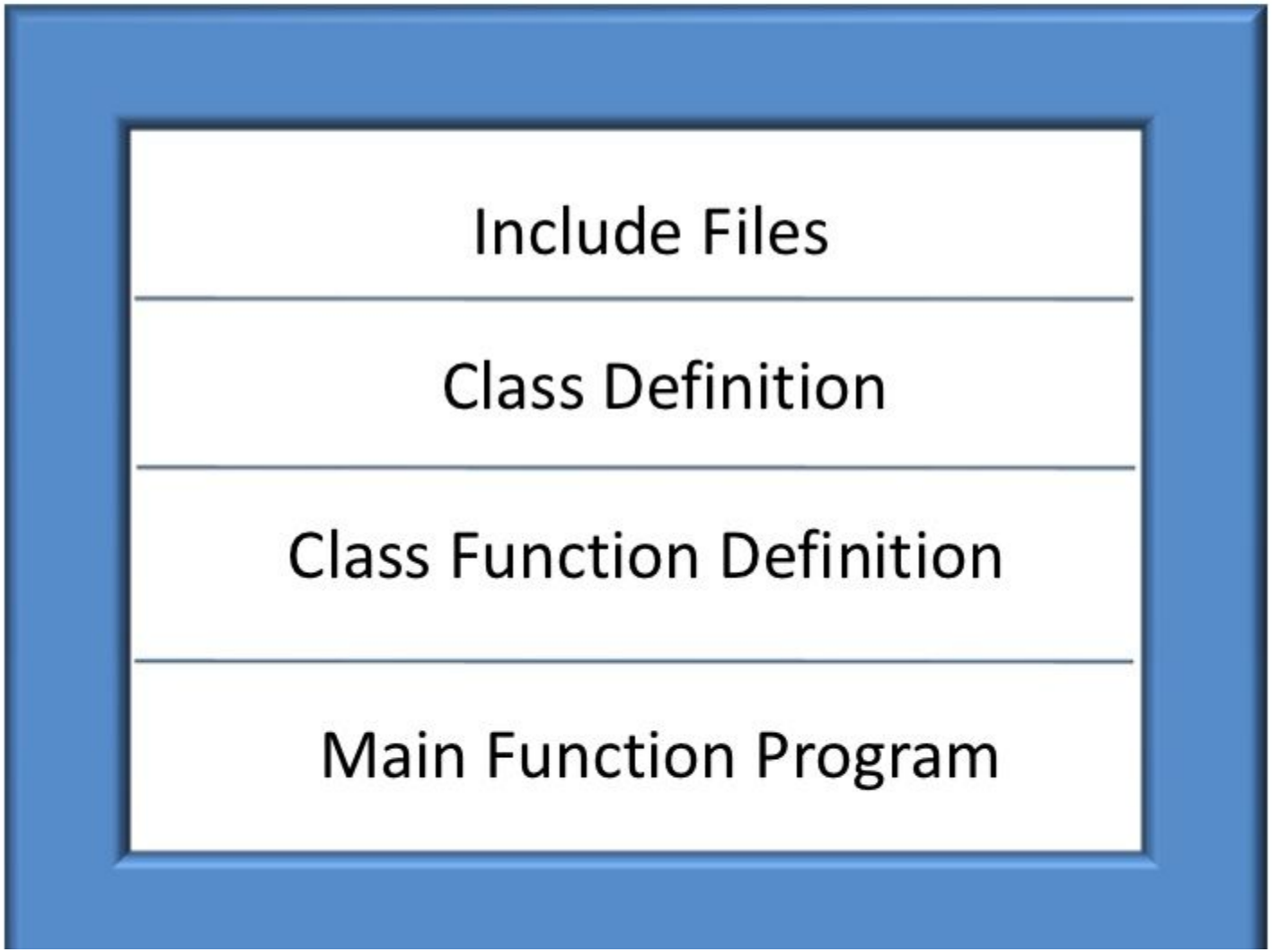
Inheritance



Polymorphism

Poly refers to many and morphism means forms.
Overloading is the concept of Polymorphism.

Structure of C++ Program



Structured Vs Object Oriented Programming

Function Oriented	Object Oriented
Procedure Abstraction	Procedure & Data abstraction
Does not support External Interface	Supports External Interface
Free flow of Data	Secured Data & not freely flows
Also called FOP	Also called OOP