

# Topics



- Abstraction
- Encapsulation

# Abstraction



[https://en.wikipedia.org/wiki/Abstraction\\_\(software\\_engineering\)](https://en.wikipedia.org/wiki/Abstraction_(software_engineering))

- Way of managing complexity by suppressing the complex details
- Abstraction refers to the act of representing essential features that are of interest of the users without including background details or explanation.
- Users of a complex system are presented with a well defined simple interface for its use
- Classes use the concept of abstraction for hiding unnecessary implementation/algorithmic details of its methods.
- As user of any 'class' what you should be aware about that class ?

# Abstraction: Simple Examples



- Suppose you have to compute the square root of a 'double' type number in a 'C' program. As a programmer what You have to do.
  - `#include <math.h>`
  - Use `sqrt()` function
- What you will do if you have to compare two strings in a 'C' program
  - `#include <string.h>`
  - Use `strcmp()` function

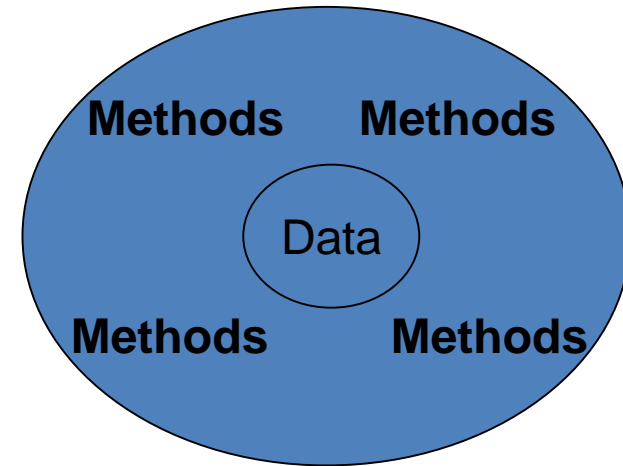
# Encapsulation

- Encapsulation means wrapping/binding up of data-part (state) and methods (operations , code) together in the form of a capsule.
- Access to code (Methods) and data (instance fields) is tightly controlled.
- Through Encapsulation, developer of a class can decide what and what can not be accessible outside a class. [ public , private , protected ]
- A class is a perfect example of an Encapsulation

# Encapsulation : Examples



***Encapsulation keeps Data Part + Operation Part of an object together inside a capsule***



```
class BOX
{
    private double length;
    private double width;
    private double height;

    public double area()      {      }
    public double volume()   {      }
} // End of class BOX
```

Class Capsule