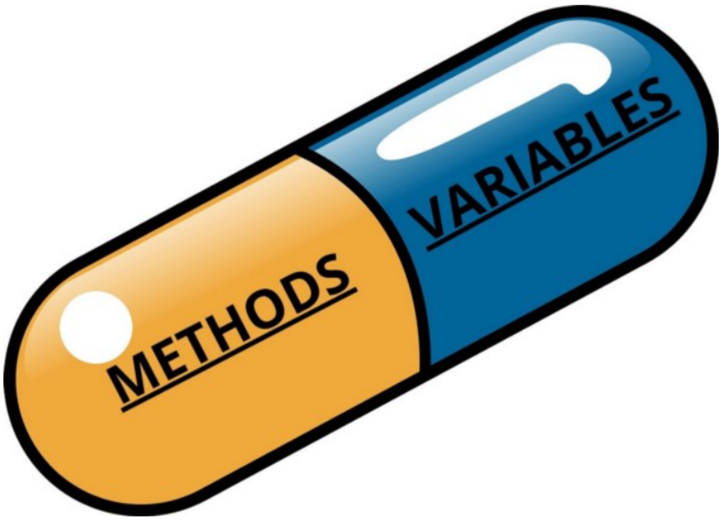
Encapsulation

Encapsulation-

Encapsulation refers to bundling data and the methods that operate on that data into a single unit. Many programming languages use encapsulation frequently in the form of classes. A class is an example of encapsulation in computer science in that it consists of data and methods that have been bundled into a single unit.

Encapsulation may also refer to a mechanism of restricting the direct access to some components of an object, such that users cannot access state values for all of the variables of a particular object. Encapsulation can be used to hide both data members and data functions or methods associated with an instantiated class or object.

In other words: Encapsulation is about wrapping data and methods into a single class and protecting it from outside intervention.



The general idea of this mechanism is simple. For example, you have an attribute that is not visible from the outside of an object. You bundle it with methods that provide read or write access. Encapsulation allows you to hide specific information and control access to the object’s internal state.

Example:

```
#include <iostream>
using namespace std;
class Student {
    // private data members
    private:
    string studentName;
    int studentRollno;
    int studentAge;
    // get method for student name to access
    // private variable studentName
    public:
        string getStudentName() {
            return studentName;
        }
    // set method for student name to set
    // the value in private variable studentName
    void setStudentName(string studentName) {
        this -> studentName = studentName;
    }
    // get method for student rollno to access
    // private variable studentRollno
    int getStudentRollno() {
        return studentRollno;
    }
    // set method for student rollno to set
    // the value in private variable studentRollno
    void setStudentRollno(int studentRollno) {
        this -> studentRollno = studentRollno;
    }
    // get method for student age to access
    // private variable studentAge
    int getStudentAge() {
        return studentAge;
    }
    // set method for student age to set
    // the value in private variable studentAge
    void setStudentAge(int studentAge) {
        this -> studentAge = studentAge;
    }
};
int main() {
    Student obj;
    // setting the values of the variables
    obj.setStudentName("Avinash");
    obj.setStudentRollno(101);
    obj.setStudentAge(22);
    // printing the values of the variables
    cout << "Student Name : " << obj.getStudentName() << endl;
    cout << "Student Rollno : " << obj.getStudentRollno() << endl;
    cout << "Student Age : " << obj.getStudentAge();
}

Output:
Student Name : Avinash
Student Rollno : 101
Student Age : 22
```