As discussed earlier, encapsulation refers to the concept of binding **data and the methods operating on that data** in a single unit also called a class.

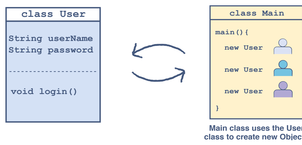
The goal is to prevent this bound data from any unwanted access by the code outside this class. Let's understand this using an example of a very basic `User` class.

Consider that we are up for designing an application and are working on modeling the **log in** part of that application. We know that a user needs a **username** and a **password** to log into the application.

A very basic `User` class will be modeled as:

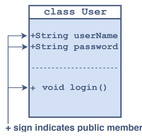
- Having a field for the `userName`
- Having a field for the `password`
- A method named `login()` to grant access

Whenever a new user comes, a new object can be created by passing the `userName` and `password` to the constructor of this class.



A Bad Example

Now it is time to implement the above discussed `User` class.



The code according to the above illustration is given below:

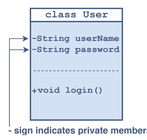
```
// User Class
class User {

  // Public Fields
  public String userName;
  public String password;

  // Parameterized Constructor to create new users
  public User(String userName, String password) {
    this.userName = userName;
    this.password = password;
  }

  public void login(String userName, String password) {
    //Check if the username and password match
    if (this.userName.toLowerCase().equals(userName.toLowerCase()) && this.password.equals(password)) {
    // .toLowrcase converts all the characters to lowercase & .equals checks if two strings match

      System.out.println("Access Granted against the username: "+this.userName +" and password: "+this.pa
    }
    else System.out.println("Invalid Credentials!"); //Else invalid credentials
  }

}

class Main {

  public static void main(String[] args) {
```

Run Save Reset

In the above coding example, we can observe that **anyone** can *access, change or print* the `password` and `userName` fields directly from the `main()` method. This is **dangerous** in the case of this `User` class because there is no encapsulation of the credentials of a user and anyone can access their account by manipulating the stored data. So the above code was not a good coding convention.

A Good Example

Let's move on to a good convention for implementing the `User` class!




```
// User Class
class User {

  // Private fields
  private String userName;
  private String password;

  //Parameterzied constructor to create a new users
  public User(String userName, String password) {
    this.userName = userName;
    this.password = password;
  }

  public void login(String userName, String password) {
    //Check if the username and password match
    if (this.userName.toLowerCase().equals(userName.toLowerCase()) && this.password.equals(password)) {
    // .toLowrcase converts all the characters to lowercase & .equals checks if two strings match

      System.out.println("Access Granted against the username: "+this.userName +" and password: "+this.pa
    }
    else System.out.println("Invalid Credentials!"); //Else invalid credentials
  }

}

class Main {

  public static void main(String[] args) {
```

Run Save Reset

In the above example, the fields of `userName` and `password` are declared `private`.

As a rule of thumb, in a class, all the member variables should be declared `private` and to access and operate on that data `public` methods like *getters, setters and custom methods* should be implemented.

This is the concept of encapsulation. All the field containing data are private and the methods which provide an interface to access those fields are public.