Encapsulation

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Encapsulation in Java

Definition:

Encapsulation in Java is the **object-oriented programming principle** of **wrapping data (fields/variables) and methods (functions) together into a single unit (class)**, and **restricting direct access** to the data by using **access modifiers**.

It ensures that the **internal representation of an object is hidden** from the outside, and can only be accessed/modified through well-defined methods (getters & setters).

Key Points

- Achieved by:
    1. Declaring **variables as private**.
    2. Providing **public getter and setter methods** to access/update them.
- Provides:
    - **Data hiding** (prevents unauthorized access).
    - **Control** over how data is modified.
    - **Security & flexibility**.
- Eg.

```java
// private instance variable
private String name ;   4 usages
private int marks ;   4 usages
```

Note :
1. In confusion btw local and global variable preference is always given to local variable
2. "this" keyword helps to represent the current obj reference
    Eg.

```java
public void setMarks(int marks){   1 usage   new *
    this.marks = marks ;
    System.out.println();
    System.out.println(name + " marks changed to " + this.marks);

}
```