ABSTARCTION

only the essential details are displayed to the user.

Encapsulation

protective shield that prevents the data from being accessed by the code outside this shield.

* Encapsulation can be achieved by declaring all the variables in a class as private and writing public methods in the class to set and get the values of the variables.

Inheritance

one class is allowed to inherit the features (fields and methods) of another class. We are achieving inheritance by using **extends** keyword.

* **Superclass:**The class whose features are inherited is known as superclass (also known as base or parent class).
* **Subclass:** The class that inherits the other class is known as subclass (also known as derived or extended or child class). The subclass can add its own fields and methods in addition to the superclass fields and methods.

Polymorphism

Overloading

Overriding

Constructor

constructor is called when an object of a class is created

At the time of calling the constructor, memory for the object is allocated in the memory.

Every time an object is created using the new() keyword, at least one constructor is called.( (it could be the default constructor))

Constructors must have the same name as the class

Constructors do not return any type

Constructors are called only once at the time of Object creation

So constructors are used to assign values to the class variables at the time of object creation, either explicitly done by the programmer or by Java itself (default constructor).

A constructor in Java can not be abstract, final, static, or Synchronized.

Access modifiers can be used in constructor declaration to control its access i.e which other class can call the constructor.

*a constructor can be declared private. A private constructor is used in restricting object creation*

1 Default constructor

**2. Parameterized Constructor in Java**

A constructor that has parameters is known as parameterized constructor. If we want to initialize fields of the class with our own values, then use a parameterized constructor.

3. Copy Constructor in Java

Unlike other constructors copy constructor is passed with another object which copies the data available from the passed object to the newly created object.

 we can overload constructors for creating objects in different ways. The compiler differentiates constructors on the basis of the number of parameters, types of parameters, and order of the parameters.

Static keyword

* **Shared memory allocation**: Static variables and methods are allocated memory space only once during the execution of the program. This memory space is shared among all instances of the class, which makes static members useful for maintaining global state or shared functionality.
* **Accessible without object instantiation:** Static members can be accessed without the need to create an instance of the class. This makes them useful for providing utility functions and constants that can be used across the entire program.
* **Associated with class, not objects:** Static members are associated with the class, not with individual objects. This means that changes to a static member are reflected in all instances of the class, and that you can access static members using the class name rather than an object reference.
* **Cannot access non-static members:** Static methods and variables cannot access non-static members of a class, as they are not associated with any particular instance of the class.
* **Can be overloaded, but not overridden**: Static methods can be overloaded, which means that you can define multiple methods with the same name but different parameters. However, they cannot be overridden, as they are associated with the class rather than with a particular instance of the class