(4) Abstraction

⇒ Abstraction means hiding internal details and showing only the essential features of an object. It helps us focus on what an object does, not how it does it.

- It is achieved through —:
(i) Abstract Class
(ii) Interfaces

(A) Abstract Class

→ An abstract class is a class that cannot be used to create objects directly. It is designed to be extended (inherited) by other classes.

- Uses abstract keyword in class.

- can have —:
(i) Fields (variables)
(ii) Constructors
(iii) Static & final methods
(iv) Abstract and concrete methods.

 Syntax

(i) ~~Defining an Abstract Class~~

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(i) Defining an Abstract Class

```
abstract class ClassName{
    // fields (variables)
    // constructors (s)

    // concrete method (with body)
      void regularMethod () {
           // code
      }

    // Abstract method (no body);    // must be overriden
    abstract void abstractMethod ();   // by child class
}
```

(ii) Extending an Abstract Class

```
class Subclass extends ClassName {
    // must override all abstract methods
    @override
    void abstractMethod () {
        // implementation
    }
}
```

(iii)   Rules of Abstract Classes in Java

1. Must use abstract keyword in class definition.
2. Allowed access modifiers → public, protected, or default (class)
    not allowed → cannot be private or final (class)
3. Can have 0 or more abstract methods.
4. Can have concrete methods with full implementation.
5. Can declare fields (variables).
6. Can have constructors (executed during subclass creation).
7. XX Cannot be instantiated using new (while obj. creation)
                                    abstract method
8. Subclasses must override, or be declared abstract.
9. Abstract methods :-

        (i) must use abstract keyword
        (ii) XX cannot be private, static, or final
        (iii) XX cannot have body.

10. Can extend another abstract or concrete class.

(iv)   Advance Concepts

1. Can contain a main () method
2. Can contain static methods and static blocks.
3. Can declare final constants
4. Abstract methods can be public, protected, or default
XX 5. XX Abstract methods cannot be private, static
        or final.

              (Examples → Github's Practice
                              folder.)