

OOP

Interface and Abstraction

Abstraction

- is a process of hiding the implementation details and showing only functionality to the user
- lets you focus on what the object does instead of how it does it

Abstract Class in Java

- A class which is declared as abstract is known as an **abstract class**. It can have abstract and non-abstract methods. It needs to be extended and its method implemented. It cannot be instantiated.

Abstract Class in Java

Rules for Java Abstract class



1

An abstract class must be declared with an abstract keyword.

2

It can have abstract and non-abstract methods.

3

It cannot be Instantiated.

4

It can have final methods

5

It can have constructors and static methods also.

Example of Abstract Class

```
//Example of an abstract class that has abstract and non-abstract methods
abstract class Bike{
    Bike(){System.out.println("bike is created");}
    abstract void run();
    void changeGear(){System.out.println("gear changed");}
}

//Creating a Child class which inherits Abstract class
class Honda extends Bike{
    void run(){System.out.println("running safely..");}
}

//Creating a Test class which calls abstract and non-abstract methods
class TestAbstraction2{
    public static void main(String args[]){
        Bike obj = new Honda();
        obj.run();
        obj.changeGear();
    }
}
```

Interface

- The interface in Java is a mechanism to achieve abstraction. There can be only abstract methods in the Java interface, not method body. It is used to achieve abstraction and multiple inheritance in Java.
- It cannot be instantiated just like the abstract class.

Interface



Example of Interface

```
//Interface declaration: by first user
interface Drawable{
    void draw();
}

//Implementation: by second user
class Rectangle implements Drawable{
    public void draw(){System.out.println("drawing rectangle");}
}

class Circle implements Drawable{
    public void draw(){System.out.println("drawing circle");}
}

//Using interface: by third user
class TestInterface1{
    public static void main(String args[]){
        Drawable d=new Circle();//In real scenario, object is provided by method e.g. getDrawable()
        d.draw();
    }
}
```