

Lecture – 10

Abstraction in Java

Abstraction in Java

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

Ways to achieve Abstraction

- There are two ways to achieve abstraction in java
- **Abstract class** (0 to 100%)
- **Interface** (100%)

Abstract class

- A class that is **declared** with **abstract keyword**, is known as **abstract class** in java.
- Abstract class can have **abstract** and **non-abstract** methods (method with body).

Example: abstract class Demo{

```
    abstract void get();           //abstract methods
    public void set(){             //non-abstract methods
        System.out.println("All ok")
    }
}
```

Abstraction in Java

- If a class have **at least one abstract method**, then the class **must** be **declared** as **abstract**.
- If a class is **declared abstract** it **cannot** be **instantiated**.
- To use an **abstract class** you have to **inherit** it from another class, provide **implementations** of the **abstract methods** in it.

Abstraction Example-1

```
abstract class Shape{  
    abstract void draw();  
}  
  
class Rectangle extends Shape{  
    void draw(){  
        System.out.println("drawing rectangle");  
    }  
  
    public static void main(String args[]){  
        Shape S;           //abstract class can't have any object but can have reference variable  
        S = new Rectangle();  
        S.draw();  
    }  
}
```

Abstraction Example-2

```
abstract class Bike{  
    Bike(){  
        System.out.println("bike is created");  
    }  
    abstract void run();  
  
    void changeGear(){  
        System.out.println("gear changed");  
    }  
}
```

```
class Honda extends Bike{  
    void run(){  
        System.out.println("running safely..");  
    }  
}  
  
class TestAbstraction2{  
    public static void main(String args[]){  
        Bike obj = new Honda();  
        obj.run();  
        obj.changeGear();  
    }  
}
```

Exercise

- A bank has two types of method saving account and current account. Yearly charge rate of the accounts are 5% and 10% of the total balance. Loan given to the accounts 50% and 70%.
- These accounts can do transactions like deposit and withdraw money. Money can be withdrawn but the remaining money must be 2% and 5% of the total balance.
- Multiple inheritance, polymorphism, abstraction.

Thank You