Interface in Java

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An interface in Java is a blueprint of a class. It has static constants and abstract methods.

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.

In other words, you can say that interfaces can have abstract methods and variables. It cannot have a method body.

Java Interface also represents the IS-A relationship.

It cannot be instantiated just like the abstract class.

Uses of Java interface

There are mainly three reasons to use interface. They are given below.

It is used to achieve abstraction.
By interface, we can support the functionality of multiple inheritance.
It can be used to achieve loose coupling.

Declaring an interface

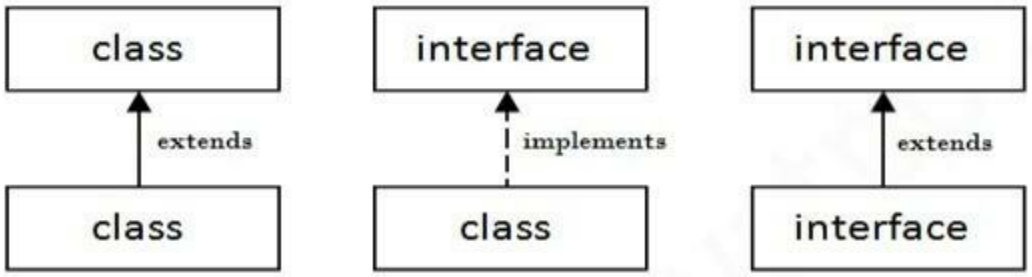
An interface is declared by using the interface keyword. It provides total abstraction; means all the methods in an interface are declared with the empty body, and all the fields are public, static and final by default. A class that implements an interface must implement all the methods declared in the interface.

Syntax:

```
interface interface_name
{
    declare constant fields
    declare methods that abstract
    by default.
}
```

Relationship between classes and interfaces

As shown in the figure given below, a class extends another class, an interface extends another interface, but a class implements an interface.



Example

```
interface A
{
   void display();
}
class B implements A
{
    public void display()
    {
        System.out.println("Hello");
     }
}
class MB
{
    public static void main(String args[])
    {
        B obj = new B();
        obj.display();
 }
}
```

Output:

Hello

Interface Example:

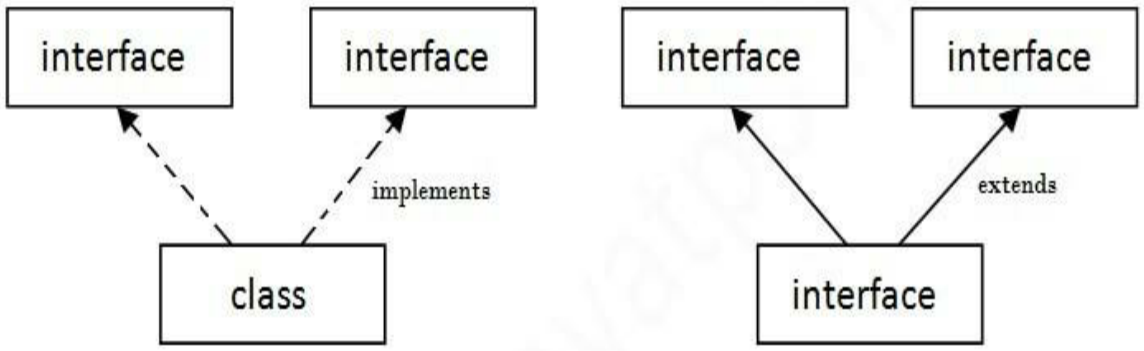
In this example, the interface A has only one method. Its implementation is provided by B and C classes. In a real scenario, an interface is defined by someone else, but its implementation is provided by different implementation providers. Moreover, it is used by someone else. The implementation part is hidden by the user who uses the interface.

```
interface A
{
   void display();
}
class B implements A
{
public void display()
{
   System.out.println("Display method in B class");
}
}
class C implements B
{
   public void display()
   {
     System.out.println("display method in C class");
    }
}
class MainClass
{
    public static void main(String args[])
    {
```

```
        D obj=new D();
    obj.draw();
}
}
```

Multiple inheritance by interface

If a class implements multiple interfaces, or an interface extends multiple interfaces, it is known as multiple inheritance.



Multiple Inheritance in Java

```
interface A
{
     void display();
}
interface B
{
   void show();
}
class C implements A,B
{
    public void display()
```

```
    {
        System.out.println("Hello");
    }
    public void show()
    {
         System.out.println("Welcome");
    }
 }
class MainClass
{
     public static void main(String args[])
      {
          C obj = new C();
          obj.display();
          obj.show();
      }
}
```

Output:

Hello

Welcome

Interface inheritance

A class implements an interface, but one interface extends another interface.

```
interface A
{
      void display();
}
interface B extends A
```

```
{
    void show();
}
class C implements B
{
    public void display()
    {
        System.out.println("Hello");
     }
     public void show()
     {
         System.out.println("Welcome");
      }
}
Class MainClass
 {
     public static void main(String args[])
     {
          C obj = new C();
          obj.display();
          obj.show();
      }
}
```

Output:

Hello

Welcome

Difference between abstract class and interface

Abstract class and interface both are used to achieve abstraction where we can declare the abstract methods. Abstract class and interface both can't be instantiated.

But there are many differences between abstract class and interface that are given below.

Abstract class	Interface
1) Abstract class can have abstract and non-abstract methods.	Interface can have only abstract methods. Since Java 8, it can have default and statc methods also.
2) Abstract class doesn't support multple inheritance.	Interface supports multple inheritance.
3) Abstract class can have fnal, non-fnal, statc and non-statc variables.	Interface has only statc and fnal variables.
4) Abstract class can provide the implementaton of interface.	Interface can't provide the implementaton of abstract class.