HowToDoInJava

Java extends vs implements Keywords

Last Updated: January 29, 2022 | By: Lokesh Gupta | Java Object Oriented Programming | Inheritance

In Java, **extends** is used for extending a class and **implements** is used for implementing the interfaces. It's the main **difference between extends vs implements**.

1. extends keyword

In Java, we can inherit the fields and methods of a class by extending it using **extends keyword**. Please note that in Java, a class can extend maximum one class only.

Take the example of `ArrayList` class. It extends `AbstractList` class which in turn extends `AbstractCollection` class.

So essentially ArrayList class has methods and behaviors of both it's parent classes AbstractList and AbstractCollection.

AbstractCollection provides methods like contains(Object o), toArray(), remove(Object o) etc. While AbstractList class provides add(), indexOf(), lastIndexOf(), clear() etc. Some of the methods are overridden by ArrayList again.

```
ArrayList.java

public class ArrayList<E> extends AbstractList<E>
        implements List<E>, RandomAccess, Cloneable, java.io.Serializable
{
  //code
}
```

Java extends example

Let's create something from scratch to better understand how Java inheritance using `extends` keyword works. I have created two classes – `ParentClass` and `ChildClass`, where **ChildClass extends ParentClass**.

```
ParentClass.java

public class ParentClass {

  public int dataVal = 100;

  public int getDataVal() {
    return this.dataVal;
  }
}
```

```
ChildClass.java

public class ChildClass extends ParentClass
{

}
```

I have not added any field or method to `ChildClass` just to show that even if we don't add anything to it, it still has behavior of it's parent class.

```
Main.java

public class Main
{
  public static void main(String[] args)
  {
    ChildClass child = new ChildClass();

    System.out.println( child.dataVal );
    System.out.println( child.getDataVal() );
  }
}
```

Program output.

```
Console

100
100
```

2. implements keyword

Interfaces are way to enforce a contract in Java. They force the implementing class to provide a certain behavior. To implement an interface, class must use **implements keyword**.

In Java, we can implement more than one interfaces. In this case, class must implement all the methods from all the interfaces. (or declare itself abstract).

Look at the ArrayList class declaration one more time. It implements 4 interfaces i.e. `List`, `RandomAccess`, `Cloneable` and `Serializable`. It has implemented all the methods in given interfaces.

Java implements example

Similar to previous example, lets create something basic to understand how interface implementations look like. I have created two interfaces `Movable` and `Swimmable`. Both interfaces define one method.

A class `Human` implement both interfaces so it MUST implement the methods defined in both interfaces.

```
Movable.java

public interface Movable {

  public void move();
}
```

```
Swimmable.java

public interface Swimmable
```

```
{
  public void swim();
}
```

```
Human.java

public class Human implements Movable, Swimmable
{
  @Override
  public void swim() {
    System.out.println("I am swimming");
  }

  @Override
  public void move() {
    System.out.println("I am moving");
  }
}
```

Now we will test the human class and it's enforced behavior.

```
Main.java

public class Main
{
  public static void main(String[] args)
  {
    Human obj = new Human();

    obj.move();
    obj.swim();
  }
}
```

Program output.

```
Console

I am moving
I am swimming
```

Clearly, Human class implemented both interfaces and defined their behavior. That's whole purpose of interfaces in Java.

3. Differences between extends vs implements

Based on above examples, let's list down the **differences between extends and implements keywords in Java**.

1. extends keyword is used to inherit a class; while implements keyword is used to inherit the interfaces.
2. A class can extend only one class; but can implement any number of interfaces.
3. A subclass that extends a superclass may override some of the methods from superclass. A class must implement all the methods from interfaces.

Happy Learning !!

Recommended Reading:

1. Java Generics PECS – Producer Extends Consumer Super
2. Java throw and throws Keywords
3. Python – Keywords
4. Overriding final static method in Java
5. Overloading vs Overriding in Java
6. Multiple Inheritance in Java
7. Guide to Inheritance

8. Interface vs Abstract Class in Java

9. Java Instanceof Operator

0. Java Instance Initializer Blocks

Join 7000+ Awesome Developers

Get the latest updates from industry, awesome resources, blog updates and much more.

Email Address

Subscribe

** We do not spam !!*

1 thought on “Java extends vs implements Keywords”

Anand

February 2, 2020 at 10:23 am

“extends is used for extending a class and implements is used for implementing the interfaces”. But extends can also be used like – interface extends interface.

Reply

Leave a Comment

Name *

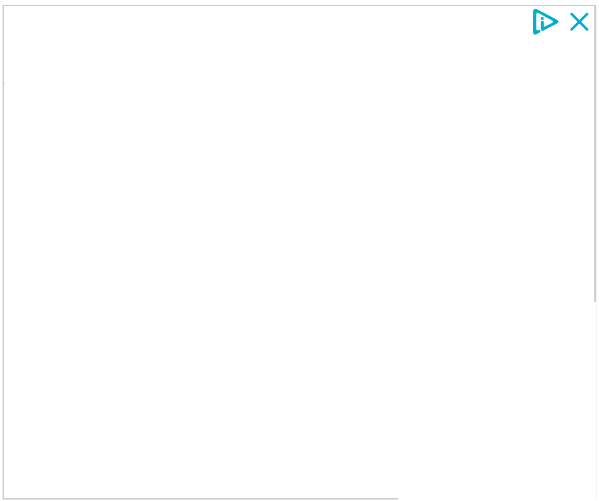
Email *

Website

☐ Add me to your newsletter and keep me updated whenever you publish new blog posts

Post Comment

Search ... 🔍



HowToDoInJava

A blog about Java and related technologies, the best practices, algorithms, and interview questions.

Meta Links

- About Me
- Contact Us
- Privacy policy
- Advertise
- Guest Posts

Blogs

REST API Tutorial