What is Is-A-Relationship in Java?

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A relationship in Java means different relations between two or more classes. For example, if a class Bulb inherits another class Device, then we can say that Bulb is having is-a relationship with Device, which implies Bulb is a device.

In Java, we have two types of relationship:

1. **Is-A relationship:** Whenever one class inherits another class, it is called an IS-A relationship.
2. **Has-A relationship:** Whenever an instance of one class is used in another class, it is called HAS-A relationship.

Is-A relationship

IS-A Relationship is wholly related to Inheritance. For example – a kiwi is a fruit; a bulb is a device.

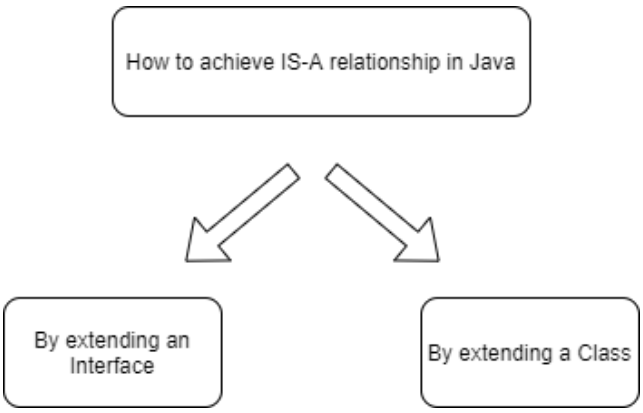
- IS-A relationship can simply be achieved by using extends Keyword.
- IS-A relationship is additionally used for code reusability in Java and to avoid code redundancy.
- IS-A relationship is unidirectional, which means we can say that a bulb is a device, but vice versa; a device is a bulb is not possible since all the devices are not bulbs.
- IS-A relationship is tightly coupled, which means changing one entity will affect another entity.

Advantage of IS-A relationship

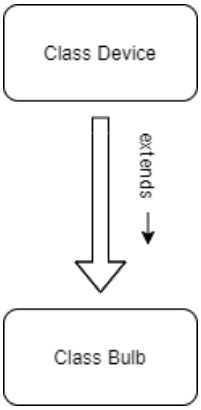
- Code Reusability.
- Reduce redundancy.

How to achieve IS-A relationship

IS-A relationship can simply be achieved by extending an interface or class by using extend keyword.



Let's understand the **IS-A relationship** with the help of a flowchart –



In the above flowchart, the class Bulb **extends** class Device, which implies that Device is the parent class of Bulb, and Class Bulb is said to have an Is-A relationship. Therefore we can say Bulb **Is-A** device.

Implementation of IS-A relationship

1. Class Device has a field named as deviceName.

2. Class Bulb extends Device that means Bulb is a type of Device.

3. Since Device is the parent class which implies that class Device can store the reference of an instance of class Bulb.

Example: Here is the implementation of the same, which is as follows:

Java

```
// Java program to demonstrate the
// working of the Is-A relationship

import java.io.*;

// parent class
class Device {

    private String deviceName;

    public void setDeviceName(String deviceName)
    {
        this.deviceName = deviceName;
    }

    public String getDeviceName()
    {
        return this.deviceName + " is a Device";
    }
}
```

```
// child class
class Bulb extends Device {
    public static void main(String gg[])
    {
        // parent class can store the reference
        // of instance of child classes
        Device device = new Bulb();

        // set the device name to bulb
        System.out.println("Device name is Bulb");
        device.setDeviceName("Bulb");

        // print the device name
        System.out.println(device.getDeviceName());
    }
}
```

Output

```
Device name is Bulb
Bulb is a Device
```

In the above java program Bulb class inherits the Device class. Therefore, we can say that Bulb is having an IS-A relationship with the class Device. Hence Bulb **is a** Device.

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