Polymorphism in Java

Polymorphism is one of the OOPs feature that allows us to perform a single action in different ways. For example, lets say we have a class Animal that has a method sound(). Since this is a generic class so we can’t give it a implementation like: Roar, Meow, Oink etc. We had to give a generic message.

public class Animal{

...

public void sound(){

System.out.println("Animal is making a sound");

}

}

Now lets say we two subclasses of Animal class: Horse and Cat that extends (see Inheritance) Animal class. We can provide the implementation to the same method like this:

public class Horse extends Animal{

...

@Override

public void sound(){

System.out.println("Neigh");

}

}

and

public class Cat extends Animal{

...

@Override

public void sound(){

System.out.println("Meow");

}

}

As you can see that although we had the common action for all subclasses sound() but there were different ways to do the same action. This is a perfect example of polymorphism (feature that allows us to perform a single action in different ways). It would not make any sense to just call the generic sound() method as each Animal has a different sound. Thus we can say that the action this method performs is based on the type of object.

Types of polymorphism and method overloading & overriding are covered in the separate tutorials. You can refer them here:

1. Method Overloading in Java – This is an example of compile time (or static polymorphism)

2. Method Overriding in Java – This is an example of runtime time (or dynamic polymorphism)

Method Overriding in Java

If subclass (child class) has the same method as declared in the parent class, it is known as method overriding in Java.

In other words, If a subclass provides the specific implementation of the method that has been declared by one of its parent class, it is known as method overriding.

Usage of Java Method Overriding

Method overriding is used to provide the specific implementation of a method which is already provided by its superclass.

Method overriding is used for runtime polymorphism

Rules for Java Method Overriding

The method must have the same name as in the parent class

The method must have the same parameter as in the parent class.

There must be an IS-A relationship (inheritance).

Method Overriding Example

Lets take a simple example to understand this. We have two classes: A child class Boy and a parent class Human. The Boy class extends Human class. Both the classes have a common method void eat(). Boy class is giving its own implementation to the eat() method or in other words it is overriding the eat() method.

The purpose of Method Overriding is clear here. Child class wants to give its own implementation so that when it calls this method, it prints Boy is eating instead of Human is eating

class Human{

//Overridden method

public void eat()

{

System.out.println("Human is eating");

}

}

class Boy extends Human{

//Overriding method

public void eat(){

System.out.println("Boy is eating");

}

public static void main( String args[]) {

Boy obj = new Boy();

//This will call the child class version of eat()

obj.eat();

}

}

Method Overriding is an example of runtime polymorphism. When a parent class reference points to the child class object then the call to the overridden method is determined at runtime, because during method call which method(parent class or child class) is to be executed is determined by the type of object.

private, static and final methods cannot be overridden as they are local to the class.