

Capture of jsp file code associated with project:

```
1 <!DOCTYPE HTML><%@page import="java.util.*"%>
2 <%@page import="test.*"%>
3 <%@page language="java" contentType="text/html; charset=ISO-8859-1"
4   pageEncoding="ISO-8859-1"%>
5 <html>
6 <head>
7 <title>Farm</title>
8 <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
9 </head>
10 <body>
11 <%
12     List<Animal> animalList = new ArrayList<Animal>();
13     animalList.add(new Cow());
14     animalList.add(new Pig());
15     animalList.add(new Horse());
16
17     for (Animal animal : animalList) {
18         out.println(animal.toString() + "<br/>");
19     }
20 %>
21 </body>
22 </html>
```

Java code for the Animal parent class:

```
1 package test;
2
3 public abstract class Animal {
4     @Override
5     public String toString() {
6         return String.format("I am an instance of %s and the sound I make is %s", getType(), getSound());
7     }
8
9     /**
10      * This method returns the type of animal.
11      * @return The animal type
12      */
13     protected abstract String getType();
14
15     /**
16      * This method returns the sound the animal makes.
17      * @return The sound the animal makes.
18      */
19     protected abstract String getSound();
20 }
```

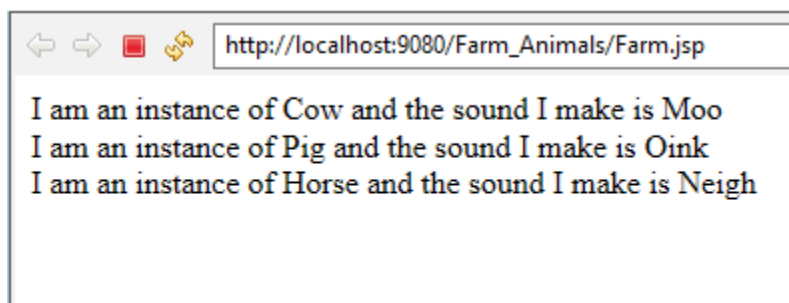
Java code for animals extending the parent class:

```
1 package test;
2
3 public class Cow extends Animal {
4     private String type = "Cow";
5     private String sound = "Moo";
6
7     protected String getType() {
8         return type;
9     }
10
11    protected String getSound() {
12        return sound;
13    }
14
15 }
```

```
1 package test;
2
3 public class Horse extends Animal {
4     private String type = "Horse";
5     private String sound = "Neigh";
6
7     protected String getType() {
8         return type;
9     }
10
11    protected String getSound() {
12        return sound;
13    }
14
15 }
```

```
1 package test;
2
3 public class Pig extends Animal {
4     private String type = "Pig";
5     private String sound = "Oink";
6
7     protected String getType() {
8         return type;
9     }
10
11    protected String getSound() {
12        return sound;
13    }
14
15 }
```

Program output:



← → 🛑 🔄 http://localhost:9080/Farm_Animals/Farm.jsp

I am an instance of Cow and the sound I make is Moo
I am an instance of Pig and the sound I make is Oink
I am an instance of Horse and the sound I make is Neigh