Steps to create a simple web application using servlets

Step 1: *create a HTML page containing a <**form**> element.*

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Factorial</title>
</head>
<body>
     <form action="factorial" method="post">
          <table>
               <tr>
                    <td>Enter a number:</td>
                    <td><input type="text" name="fact"></td>
               </tr>
               <tr>
          <td colspan="2"><input type="submit" value="find"/></td>
               </tr>
          </table>
     </form>
</body>
</html>
```

This name should be same as the name given in the **<url-mapping>** element in **web.xml**

Step 2: *create a new servlet and override the **doPost()** or **doGet()** method based on the value of the **method** attribute given in the HTML page's <form> element.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {

     }

}
```

Step 3: *Use the **request** object to read the parameters sent from the HTML file.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
response)throws ServletException, IOException {

long number = Integer.parseInt(request.getParameter("fact"));
     }

}
```

Step 4: *Use the **response** object to set the **content-type** as **text/html** and get the **PrintWriter** object.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
long number = Integer.parseInt(request.getParameter("fact"));

response.setContentType("text/html");
PrintWriter out = response.getWriter();
     }

}
```

Step 5: ***Process the data** based on the service to be provided. ex: validating the username and password, calculating the factorial etc.,*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

public long calcFactorial(long number) {
          if (number == 1 || number == 0) {
               return 1;
          } else {
               return number * calcFactorial(number - 1);
          }
     }

protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
long number = Integer.parseInt(request.getParameter("fact"));

response.setContentType("text/html");
PrintWriter out = response.getWriter();

     }

}
```

Step 6: *Use the **PrintWriter** object **out** to print the response in HTML format.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

public long calcFactorial(long number) {
          if (number == 1 || number == 0) {
               return 1;
          } else {
               return number * calcFactorial(number - 1);
          }
     }
```

```
protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
long number = Integer.parseInt(request.getParameter("fact"));

response.setContentType("text/html");
PrintWriter out = response.getWriter();

out.println("Factorial of "+number+" is:<b>" +calcFactorial(number)+
"</b>");

      }

}
```

Step 7: *Add the **servlet** and **servlet mapping** to the deployment descriptor **web.xml.***

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app>
    <servlet>
     <servlet-name>fact</servlet-name>
     <servlet-class>com.wipro.servlet.FactorialServlet</servlet-class>
     </servlet>
     <servlet-mapping>
          <servlet-name>fact</servlet-name>
          <url-pattern>/factorial</url-pattern>
     </servlet-mapping>
</web-app>
```

Provide this name in the **action** attribute of the <form> element in the HTML page without '/ '

Steps to create a web application using servlets for Form Processing

Step 1: *create a HTML page containing a <**form**> element.*

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Login</title>
</head>
<body>
     <FORM NAME="login" ACTION="MyServlet" METHOD="POST">
          <table>
               <tr>
                    <td>Enter username :</td>
                    <td><input type=text  name="username"/></td>
               </tr>
               <tr>
                    <td>Enter Password :</td>
                    <td><input type=password name="pass"/></td>
               </tr>
               <tr>
                    <td><input type="submit" value="Submit" /></td>
                    <td><input type="reset" value="Clear" /></td>
               </tr>
          </table>
     </FORM>
</body>
</html>
```

Step 2: *create a new servlet and override the **doPost()** or **doGet()** method based on the value of the **method** attribute given in the HTML page's <form> element.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class MyServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                  response)  throws ServletException, IOException {

}
```

Step 3: *Use the **request** object to read the parameters sent from the HTML file.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class MyServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                  response)  throws ServletException, IOException {

String uname = request.getParameter("username");
String passwd = request.getParameter("pass");

}
```

Step 4: *Use the **response** object to set the **content-type** as **text/html** and get the **PrintWriter** object.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class MyServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                  response)  throws ServletException, IOException {

String uname = request.getParameter("username");
String passwd = request.getParameter("pass");

response.setContentType("text/html");
PrintWriter out = response.getWriter();

}
```

Step 5: ***Process the data** based on the service to be provided. ex: validating the username and password, calculating the factorial etc.,*

Step 6: *Use the **PrintWriter** object **out** to print the response in HTML format.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class MyServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                    response)  throws ServletException, IOException {

String uname = request.getParameter("username");
String passwd = request.getParameter("pass");

response.setContentType("text/html");
PrintWriter out = response.getWriter();

if (uname.equals("john") && passwd.equals("apple")) {
                out.print("<html>");
                out.print("<head></head>");
                out.print("<body>");
                out.print("Welcome,"+uname);
                out.print("</body>");
                out.print("</html>");
            } else {
                response.sendRedirect("Login.html");
            }

}
```

Step 7: *Add the **servlet** and **servlet mapping** to the deployment descriptor **web.xml.***

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app>
    <servlet>
    <servlet-name>login</servlet-name>
    <servlet-class>com.wipro.servlet.MyServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>login</servlet-name>
    <url-pattern>/MyServlet</url-pattern>
  </servlet-mapping>
</web-app>
```

Steps to create a web application using servlets for Database Connectivity

Step 1: *create a HTML page containing a <form> element.*

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>User Details</title>
</head>
<body>
     <form name="registerForm" action="user" method="post">
          <table>
               <tr>
                    <td>UserName</td>
                    <td><input type="text" name="username" /></td>
               </tr>
               <tr>
                    <td>Password</td>
                    <td><input type="password" name="password" /></td>
               </tr>
               <tr>
                    <td>Email</td>
                    <td><input type="email" name="email" /></td>
               </tr>
               <tr>
                    <td>PhoneNumber</td>
                    <td><input type="text" name="phone" /></td>
               </tr>
               <tr>
          <td><input type="submit" name="option" value="Register" />
          <input type="submit" name="option"  value="Update" /></td>
          <td><input type="submit" name="option" value="Delete" />
          <input type="submit" name="option"  value="Show" />
                    </td>
```

```
                </tr>
            </table>
        </form>
</body>
</html>
```

Step 2: *create the two HTML pages* ***Success.html*** *and* ***Error.html****.*

Success.html

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Success</title>
</head>
<body>
<h1>Operation completed successfully!</h1>
</body>
</html>
```

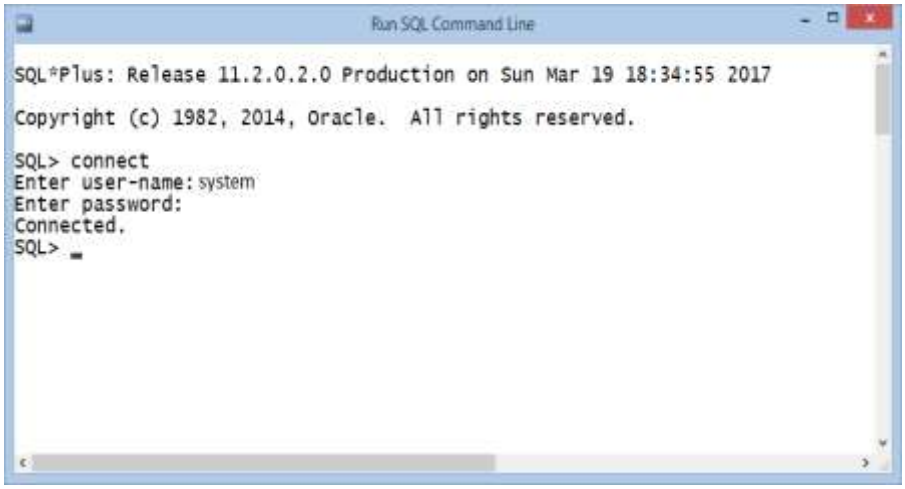
Error.html

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Error</title>
</head>
<body>
<h1>Error Occured</h1>
</body>
</html>
```

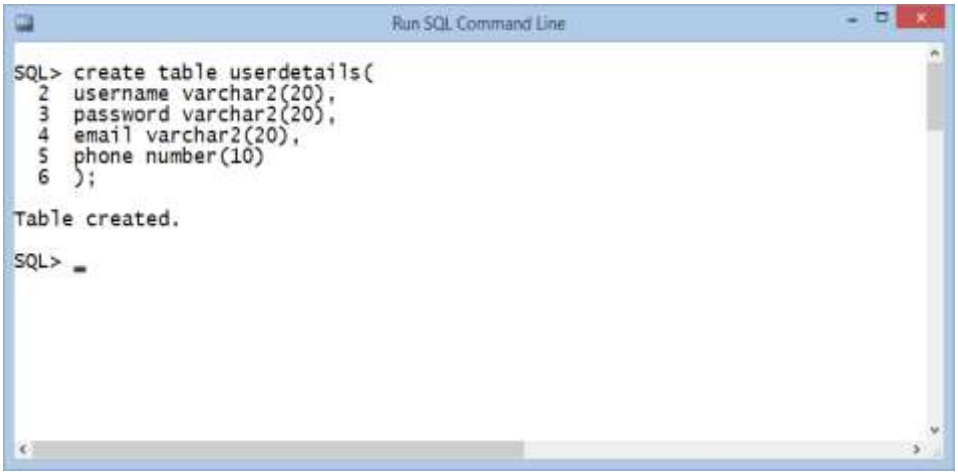
Step 3: *create the* ***table*** *in the database by using* ***sqlplus*** *(in case of Oracle).*

a. *Go to run (windows Key + R) and type* ***sqlplus****.*

b. *Type* ***connect****. You will be prompted for username. Type* ***system*** *as the username and password as* ***admin.***



*c. Type the **SQL query** to create the table.*



Step 4: *create a class **DBUtil** that creates a database connection and returns it.*

```
package com.wipro.util;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

public class DBUtil {

private static Connection con;

public static Connection getConnection() {
try {
     if (con == null)
 {
     Class.forName("oracle.jdbc.driver.OracleDriver");
con =
DriverManager.getConnection("jdbc:oracle:thin:@localhost:1521:xe",
"admin", "admin");
          }

          } catch (Exception e) {
               System.out.println(e);
          }

          return con;
     }
}
```

Step 5: *create a new servlet and override the **doPost()** or **doGet()** method based on the value of the **method** attribute given in the HTML page's <form> element.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class UserServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                    response)  throws ServletException, IOException {
}
```

Step 6: *Use the **request** object to read the parameters sent from the HTML file.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                    response)  throws ServletException, IOException {

//Retrieving all the parameters from the form
     String username = request.getParameter("username");
     String password = request.getParameter("password");
     String email = request.getParameter("email");
     long phone = Long.parseLong(request.getParameter("phone"));
     String option = request.getParameter("option");
}
}
```

Step 7: *Create reference for the **Connection, Statement** and **ResultSet** interfaces required for JDBC.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;
```

```
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

     Connection con;
     Statement st;
     ResultSet rs;

protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {

     //Retrieving all the parameters from the form
     String username = request.getParameter("username");
     String password = request.getParameter("password");
     String email = request.getParameter("email");
     long phone = Long.parseLong(request.getParameter("phone"));
     String option = request.getParameter("option");
}
}
```

Step 8: *Use the **response** object to set the **content-type** as **text/html** and get the **PrintWriter** object.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

     Connection con;
     Statement st;
     ResultSet rs;

protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {

     //Retrieving all the parameters from the form
     String username = request.getParameter("username");
```

```
        String password = request.getParameter("password");
        String email = request.getParameter("email");
        long phone = Long.parseLong(request.getParameter("phone"));
        String option = request.getParameter("option");

        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

    }
    }
```

Step 9: *Use the connection reference **con** to get the connection from the **getConection()** method of the **DBUtil** class and create the statement to perform various DB operations such as Insert, Update, Delete, Select etc..*

- ***a.*** *Use the **response** object to redirect the output to **Success.html** if the operation is successful else redirect it to **Error.html**.*

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

    Connection con;
    Statement st;
    ResultSet rs;

protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {

    //Retrieving all the parameters from the form
    String username = request.getParameter("username");
    String password = request.getParameter("password");
    String email = request.getParameter("email");
    long phone = Long.parseLong(request.getParameter("phone"));
    String option = request.getParameter("option");

    response.setContentType("text/html");
    PrintWriter out = response.getWriter();

try {
```

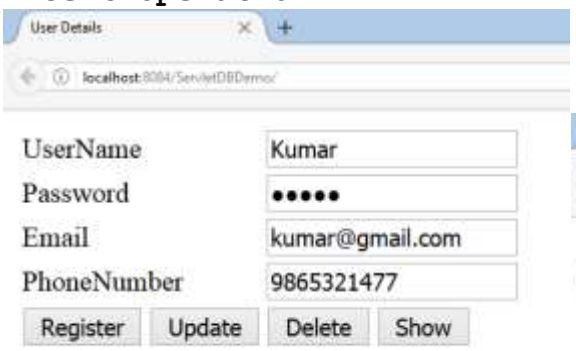
```
            //Get the connection
            con = DBUtil.getConnection();
            //Create the statement
            st = con.createStatement();
//Insert operation
     if (option.equals("Register")) {

st.executeUpdate("insert into userdetails values('" + username + "','"
+ password + "','" + email + "',"+ phone + ")");
                response.sendRedirect("Success.html");

     }
//Update operation
     if (option.equals("Update")) {

st.executeUpdate("update userdetails set password='" + password + "',
email='" + email + "',phone="+ phone + " where username='" + username
+ "'");
     response.sendRedirect("Success.html");

     }
//Delete operation
if (option.equals("Delete")) {

st.executeUpdate("delete from userdetails where username='" + username
+ "'");
response.sendRedirect("Success.html");

     }
//Select Operation
if (option.equals("Show")) {

     rs = st.executeQuery("select * from userdetails");

     if (rs != null) {

            out.println("<table border='1'>");
out.println("<th>Name</th><th>Password</th><th>Email</th><th>Phone
No.</th>");
while (rs.next()) {
     out.println("<tr><td>" + rs.getString(1) + "</td><td>" +
     rs.getString(2) + "</td><td>" + rs.getString(3) + "</td><td>" +
     rs.getLong(4) + "</td></tr>");
                         }
            out.print("</table>");
                    }
               }
            } catch (Exception e) {
```

```
                response.sendRedirect("Error.html");
            }

        }

}
```

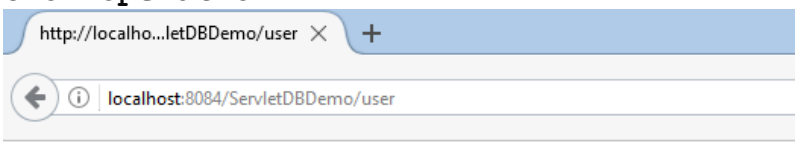
Step 10: *Add the **servlet** and **servlet mapping** to the deployment descriptor **web.xml.***

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app>
    <servlet>
        <servlet-name>user</servlet-name>
        <servlet-class>com.wipro.servlet.UserServlet</servlet-class>
     </servlet>
     <servlet-mapping>
        <servlet-name>user</servlet-name>
        <url-pattern>/user</url-pattern>
     </servlet-mapping>
</web-app>
```

Insert operation

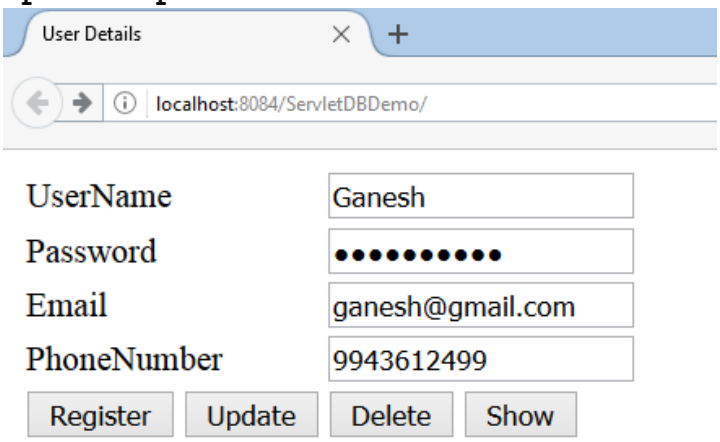


Show operation

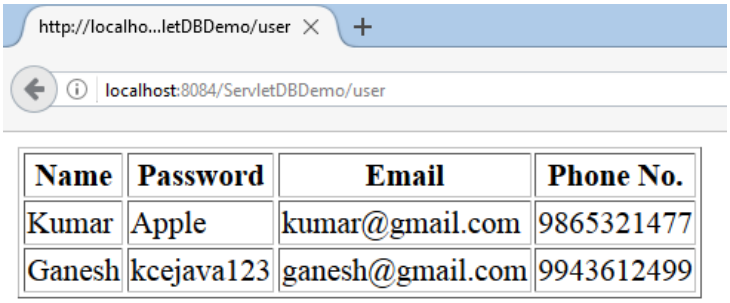


Name	Password	Email	Phone No.
Kumar	Apple	kumar@gmail.com	9865321477
Ganesh	mango	ganesh@yahoo.co.in	9943612499

Update operation

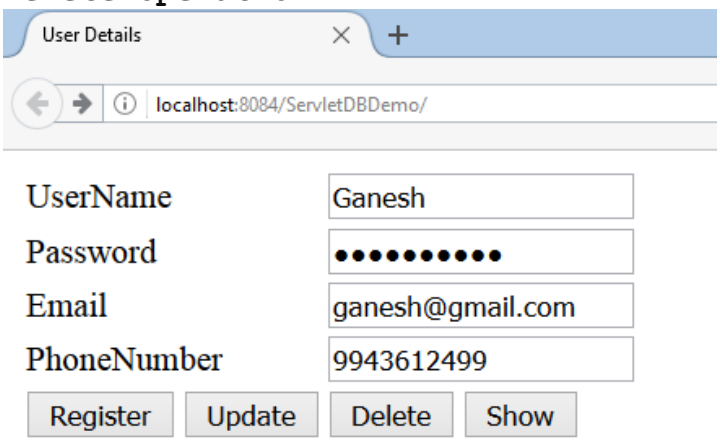


After update

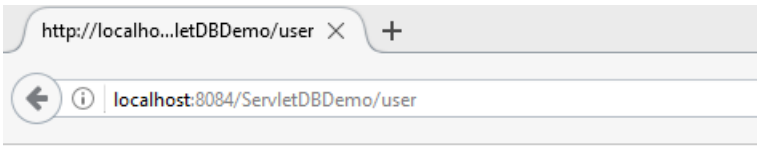


Name	Password	Email	Phone No.
Kumar	Apple	kumar@gmail.com	9865321477
Ganesh	kcejava123	ganesh@gmail.com	9943612499

Delete operation



After delete

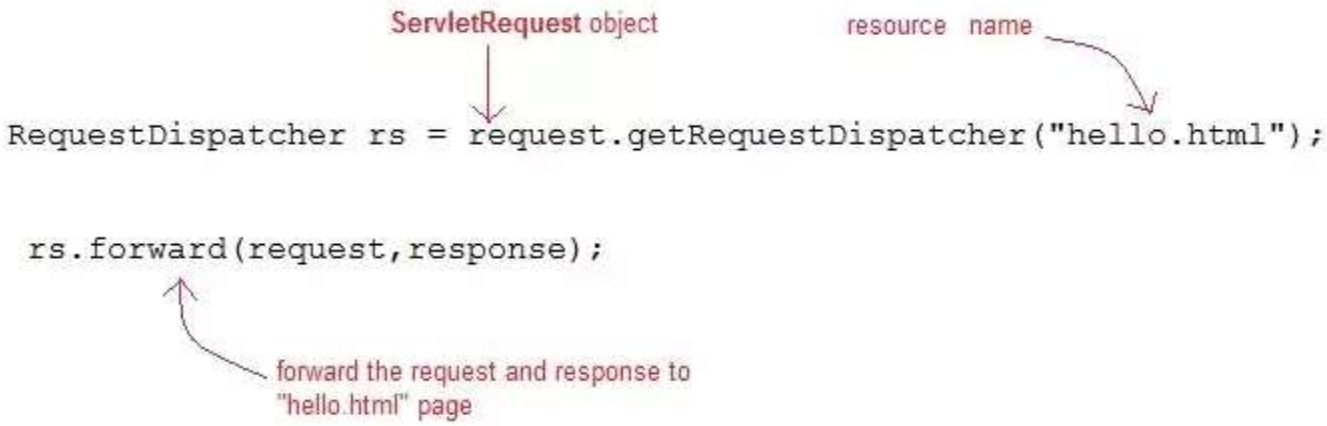


Name	Password	Email	Phone No.
Kumar	Apple	kumar@gmail.com	9865321477

Forwarding a request using Request Dispatcher

- *The **RequestDispatcher** interface provides the facility of dispatching the request to another resource it may be html, servlet or jsp*
- *To forward the request to another page:*

```
RequestDispatcher rs = request.getRequestDispatcher("hello.html");
rs.forward(request,response);
```



- *To include the response of another page in the current page:*

```
RequestDispatcher rs = request.getRequestDispatcher("hello.html");
rs.include(request,response);
```