



## GET and POST Requests

Request & Response Objects



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## Agenda

1

**doGet and doPost methods**

2

**HttpServletRequest & HttpServletResponse**

3

**Create & Deploy Simple application**

4

**Accessing database**

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## Objectives

At the end of this module, you will be able to:

- Describe the role of HTTP Servlet in Web Programming
- Describe and use the Servlet Life Cycle methods appropriately
- Process parameters from HTML forms
- Establish Database Connectivity through servlets

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## The doGet and doPost methods

- Methods *doGet()* and *doPost()* in *HttpServlet* class receives appropriate client request, and formats a response using 2 arguments
  - An *HttpServletRequest object* - encapsulates data from the client
  - An *HttpServletResponse object* - encapsulates response to the client
- Both these objects are created by the servlet container
- **Usage:**
  - `public void doPost(HttpServletRequest req, HttpServletResponse res) throws IOException, ServletException`
  - `public void doGet(HttpServletRequest req, HttpServletResponse res) throws IOException, ServletException`

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## HttpServletRequest interface

- **HttpServletRequest**

- The HttpServletRequest object incorporates any communication from client to servlet
  - Provides methods that allow you to retrieve incoming information

*For example:* HTTP request headers, form data, or a client's hostname

- Methods to read parameters from a form

- `getParameter(String pname)`
  - `getParameterNames()`
  - `getParameterValues(String pname)`

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# HttpServletResponse interface

- **HttpServletResponse**

- The HttpServletResponse object incorporates any communication from servlet to client
  - Allows you to specify outgoing information

*For example:* response headers and HTTP status codes

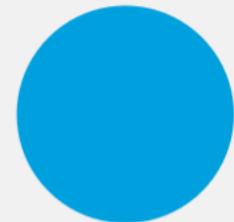
- Also enables you to obtain a PrintWriter object for writing output back to the client

- Methods:

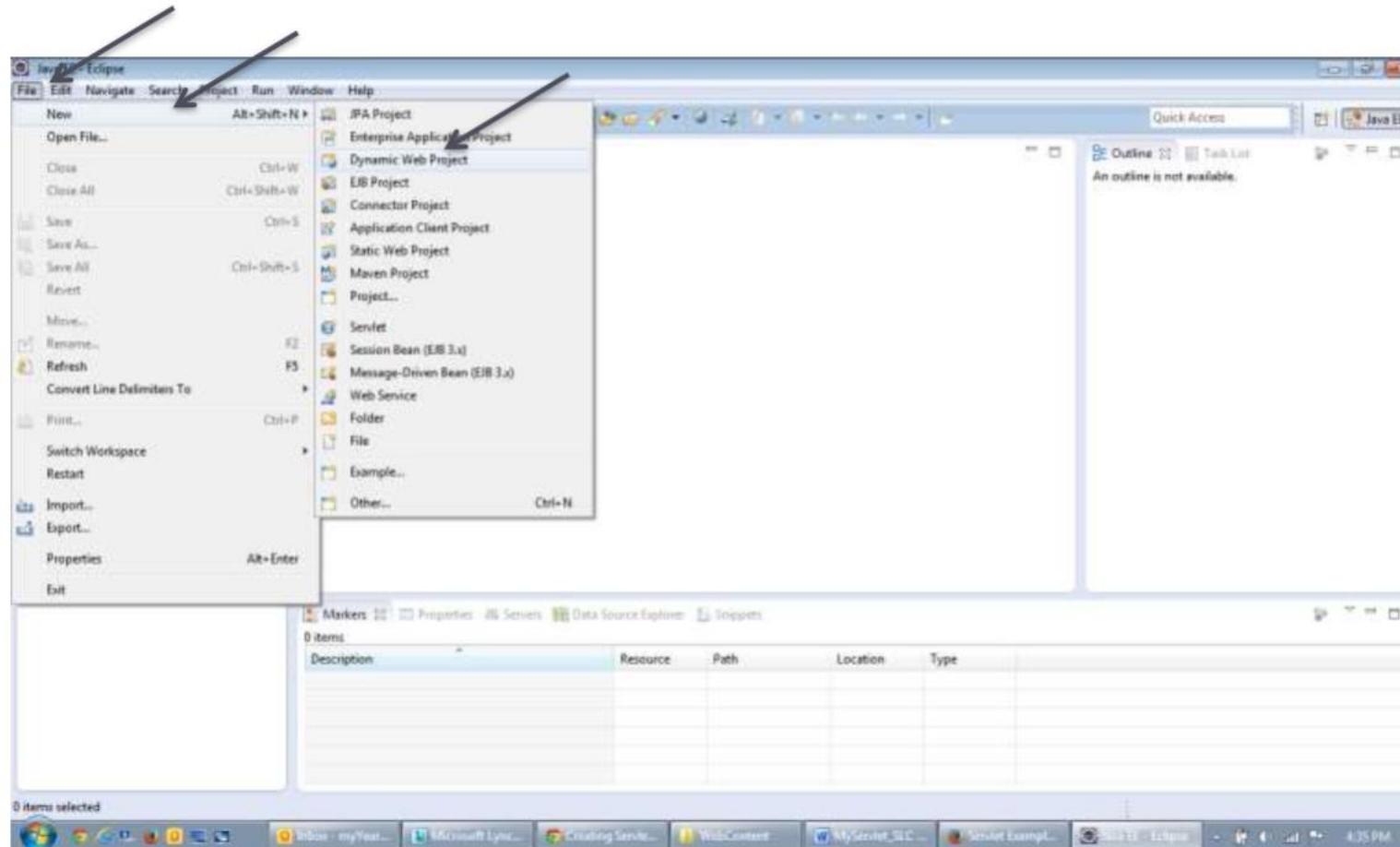
- getWriter
  - setContentType
  - sendRedirect

# First Servlet Example

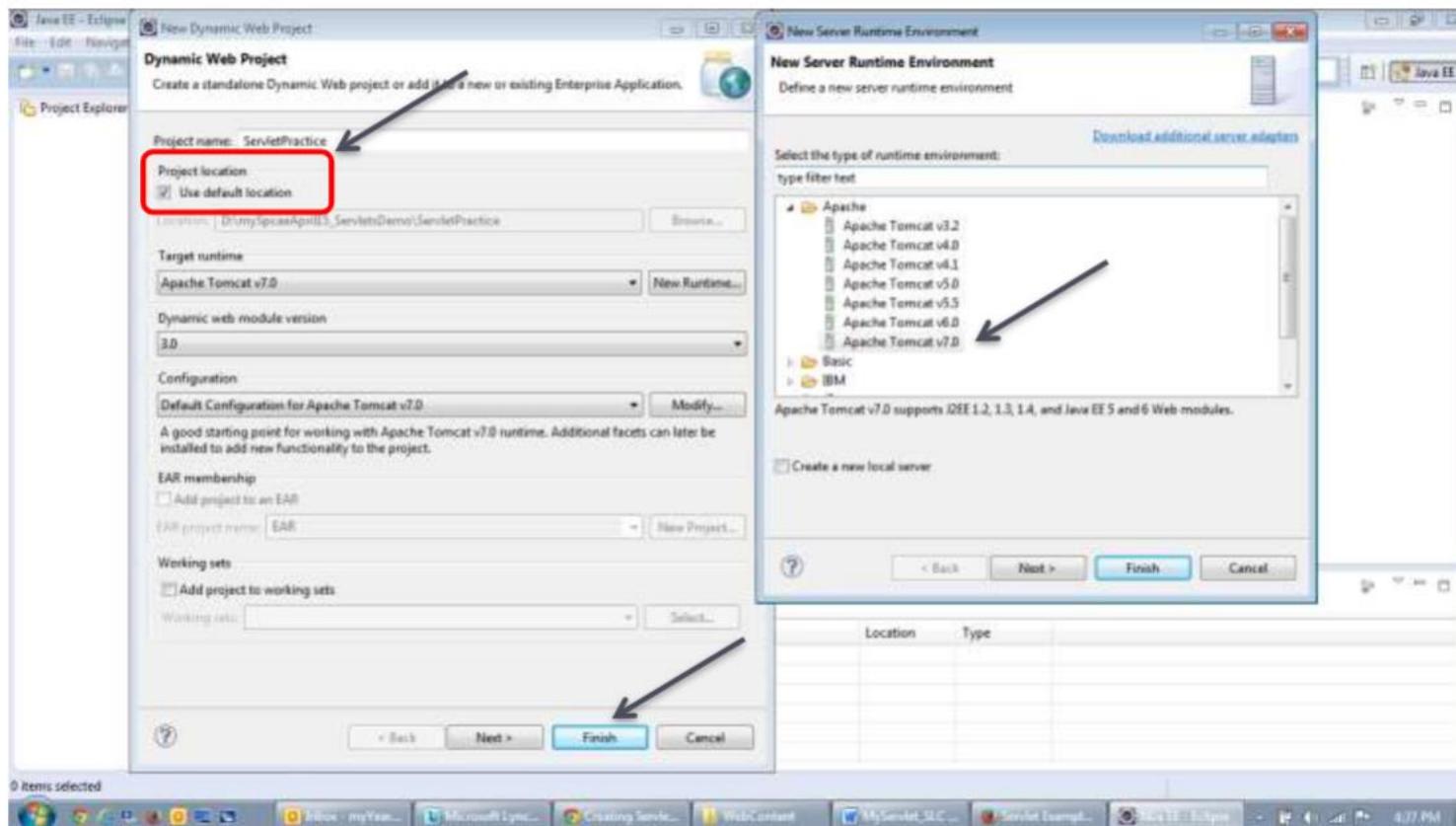
## Demo



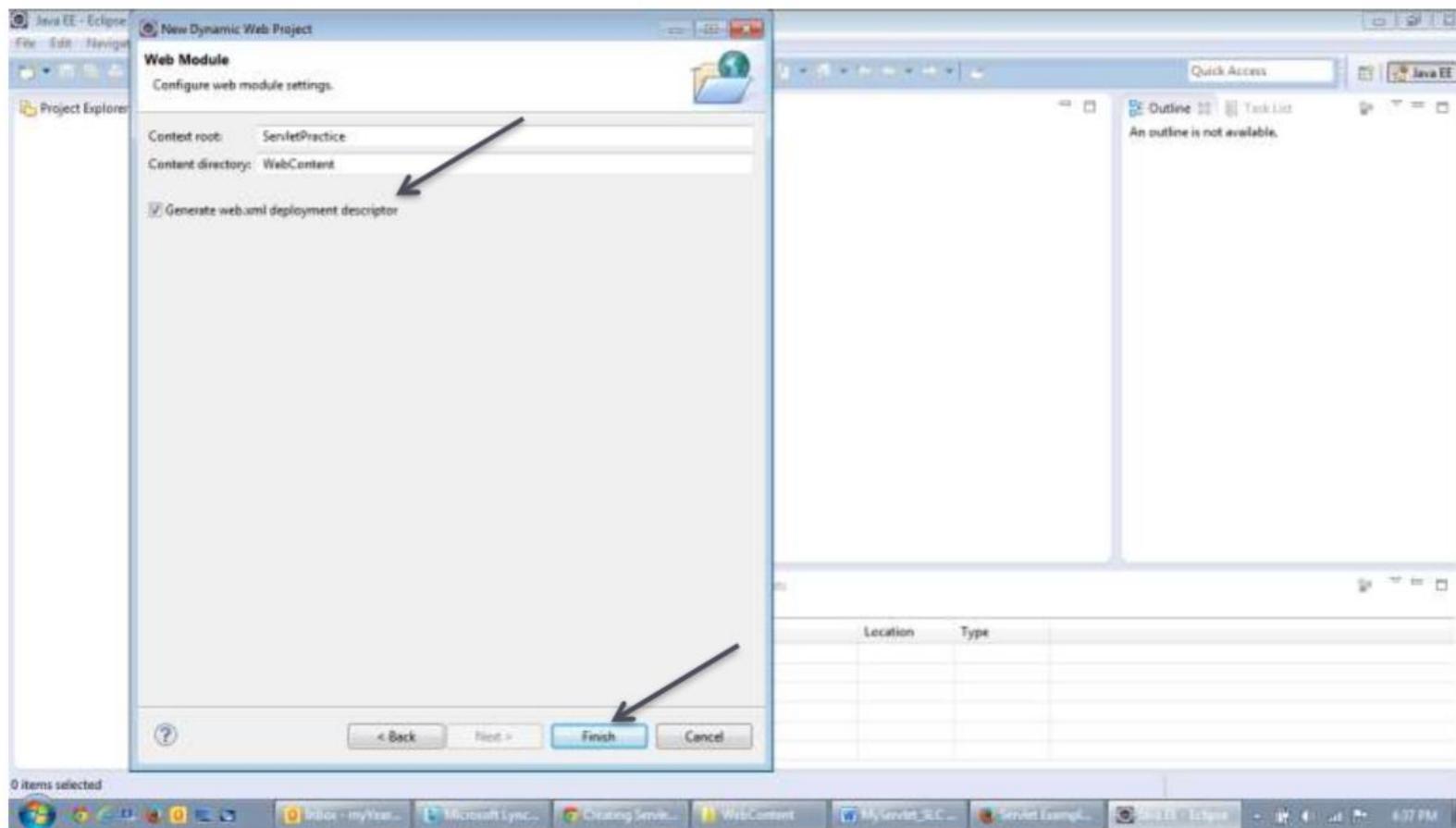
# Create the dynamic web project



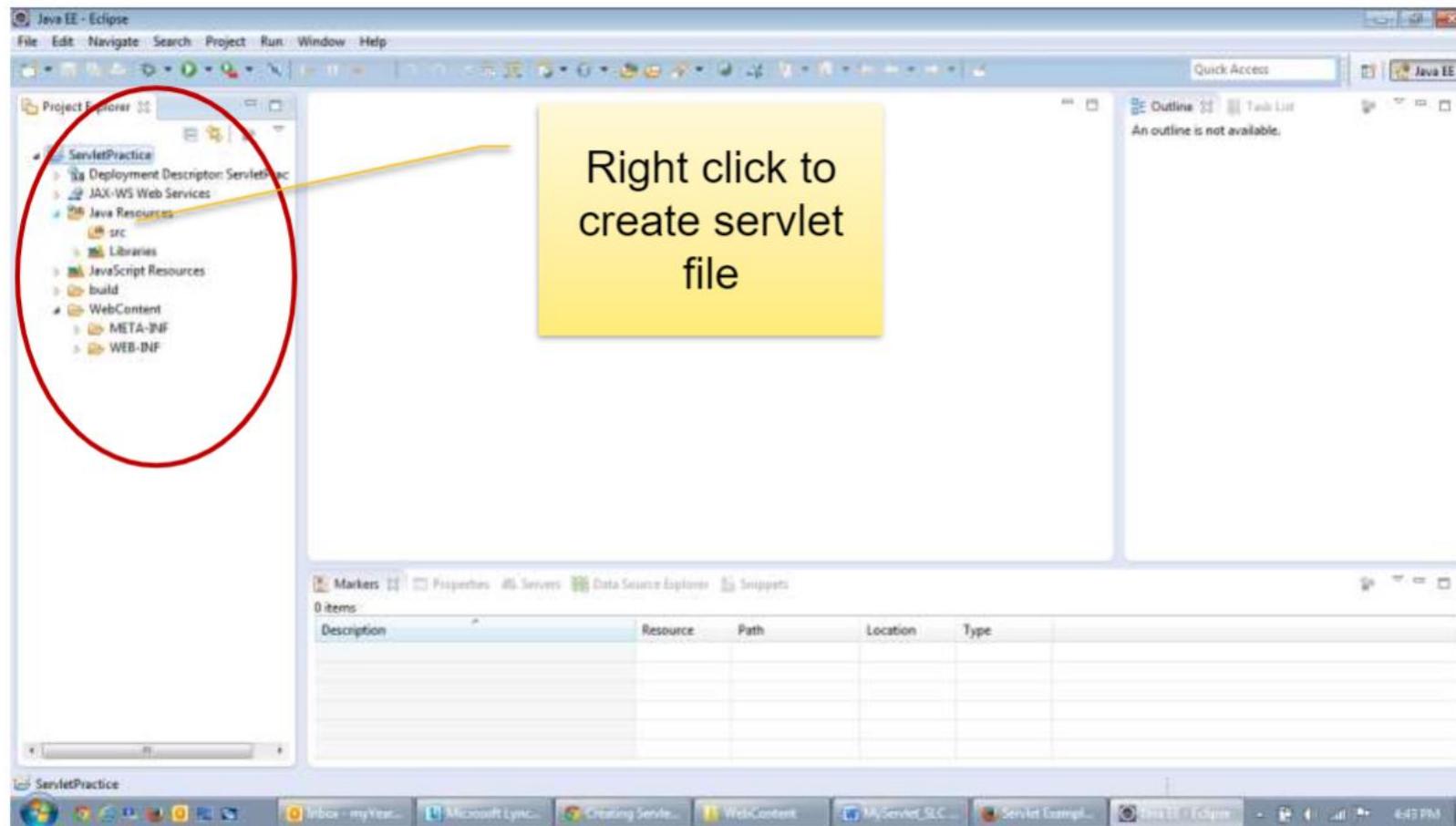
# Configure tomcat server in Eclipse? (One time Requirement)



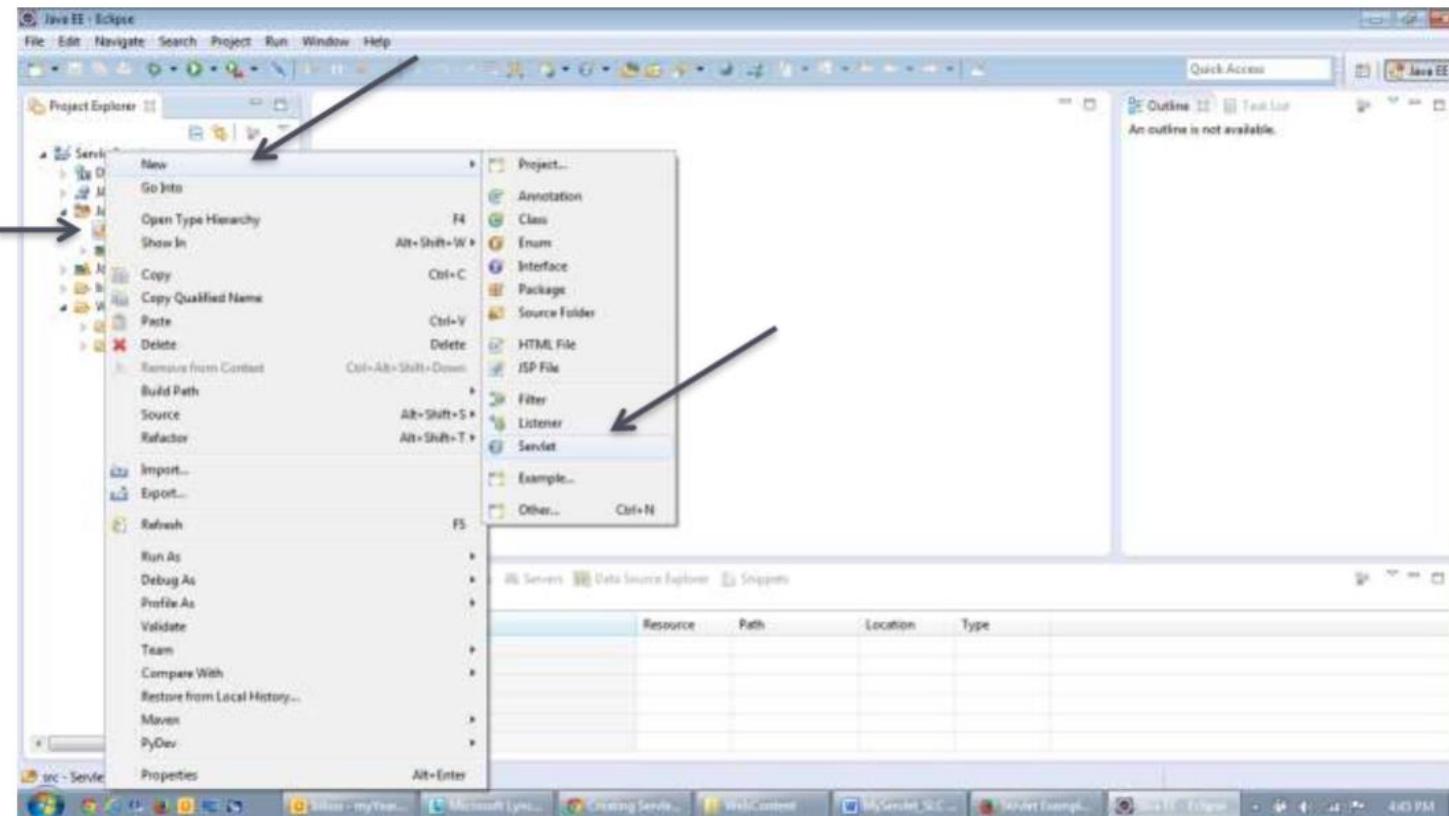
# Enable web.xml deployment descriptor



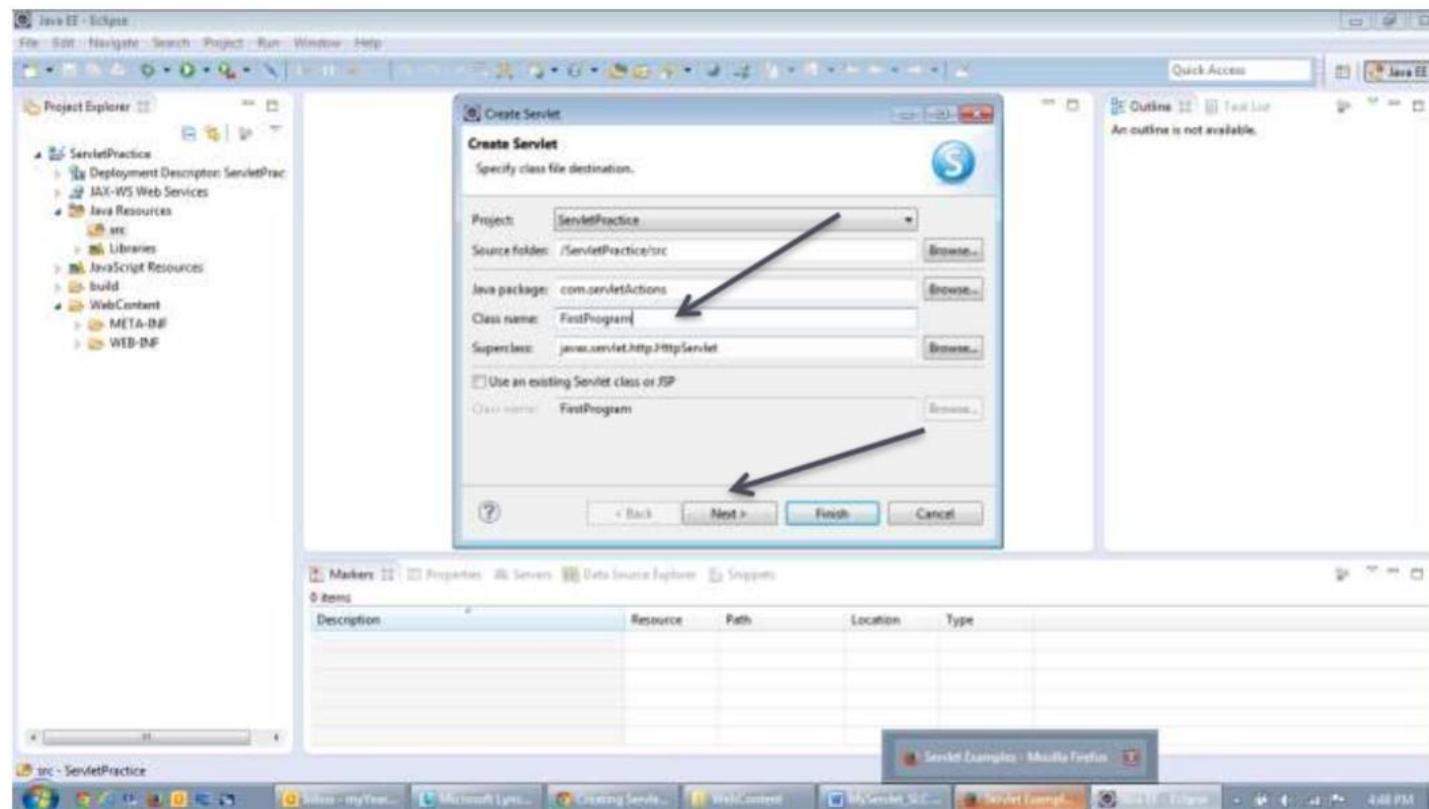
## Create the servlet



## Select the servlet option



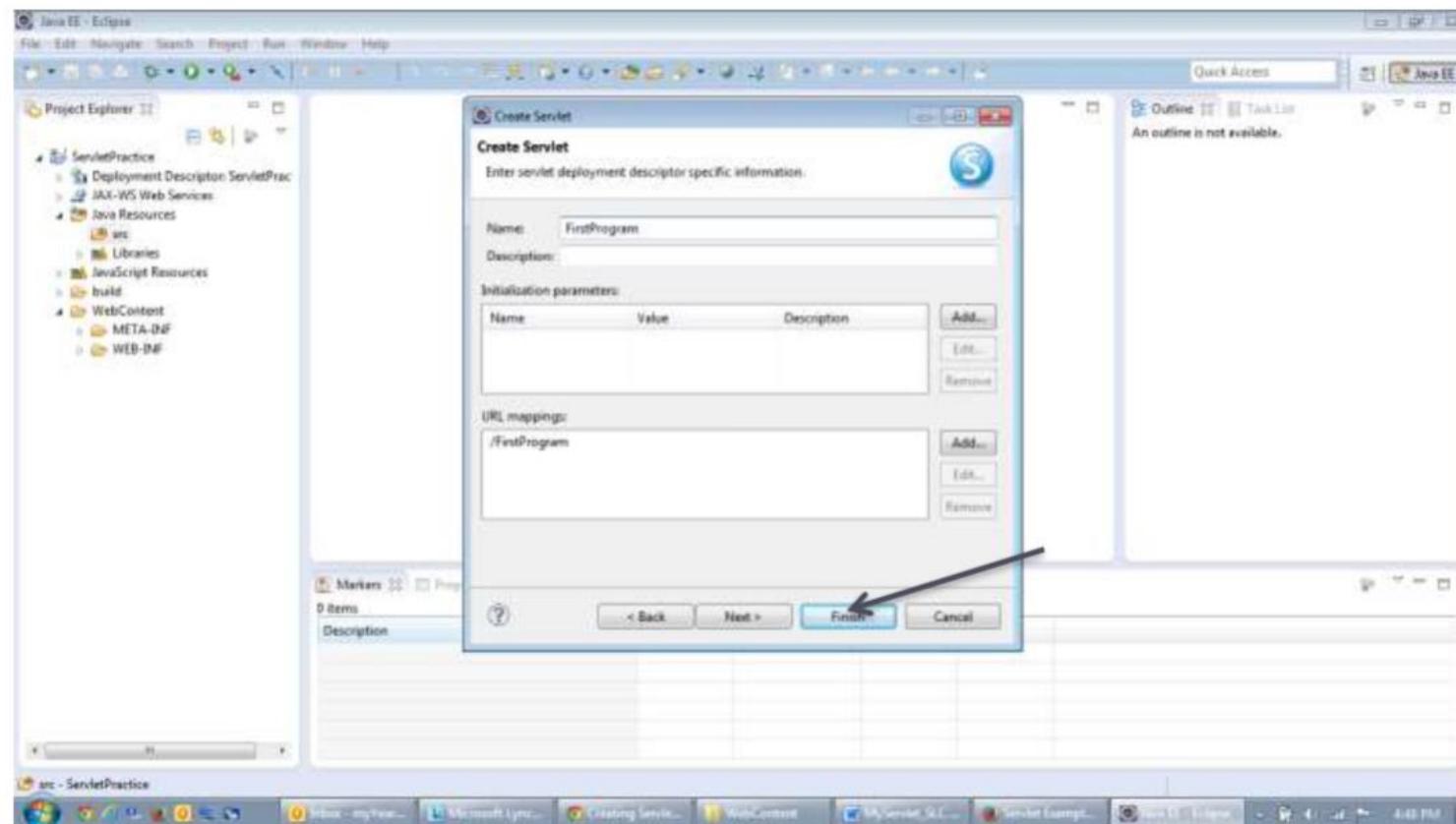
# Type class name



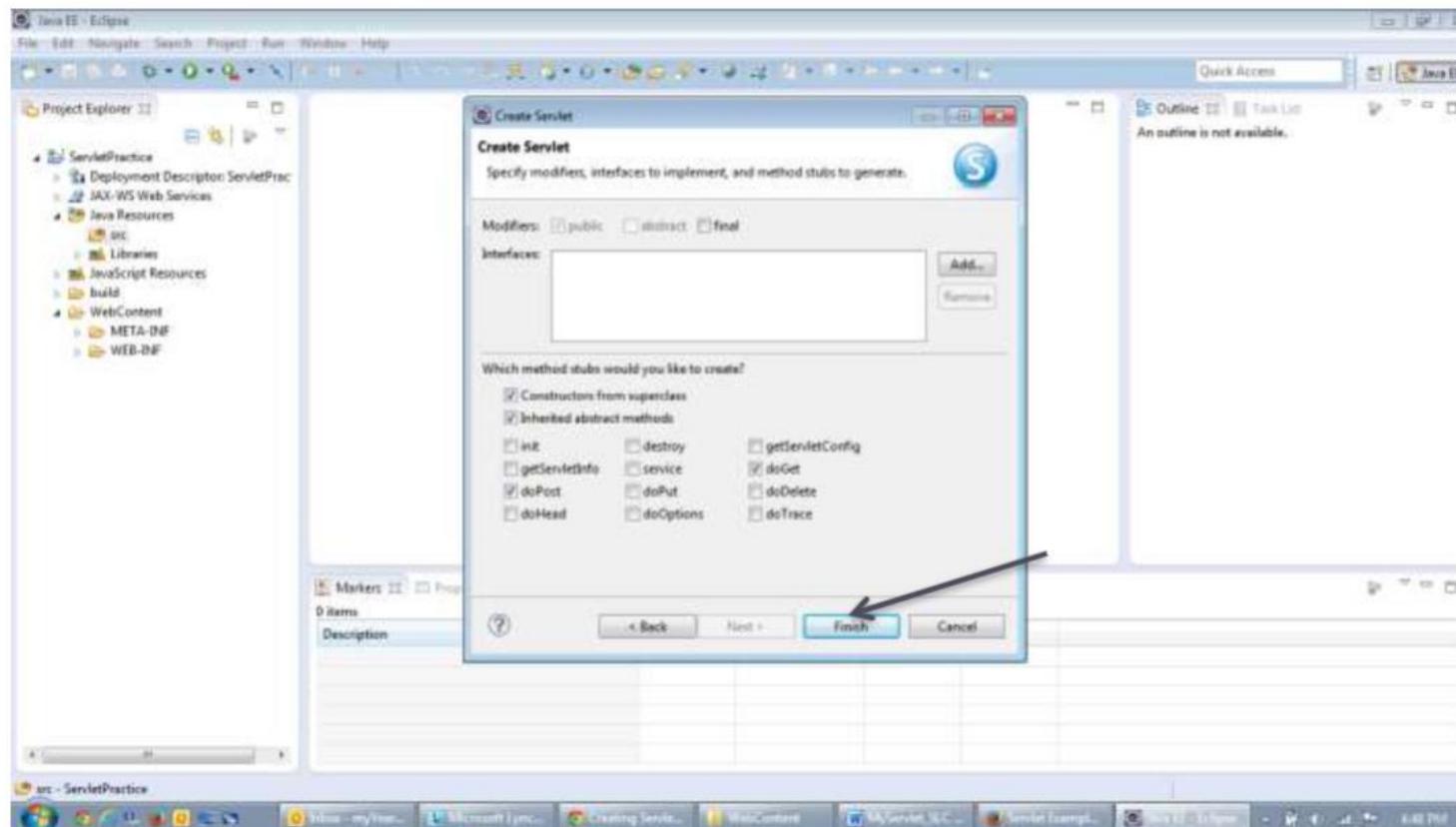
Activate Windows

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Go to Settings to activate Windows.



# Select Finish



Java EE - ServletPractice [src] /com/vanslatActions/FirstProgram.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Project Explorer

- ServletPractice
  - Deployment Descriptor: ServletPrac
  - JAX-WS Web Services
  - Java Resources
    - src
    - Libraries
    - JavaScript Resources
  - build
  - WebContent
    - META-INF
    - WEB-INF

FirstProgram.java

```
package com.vanslatActions;

import java.io.IOException;
/*
 * Servlet implementation class FirstProgram
 */
@.WebServlet("/FirstProgram")
public class FirstProgram extends HttpServlet {
    private static final long serialVersionUID = 1L;

    /**
     * @see HttpServlet#HttpServlet()
     */
    public FirstProgram() {
        super();
        // TODO Auto-generated constructor stub
    }

    /**
     * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
     */
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException {
        // TODO Auto-generated method stub
    }
}
```

Outline Task List

- com.vanslatActions
- FirstProgram
  - serialVersionUID : long
  - FirstProgram()
  - doGet(HttpServletRequest, HttpServletResponse)
  - doPost(HttpServletRequest, HttpServletResponse)

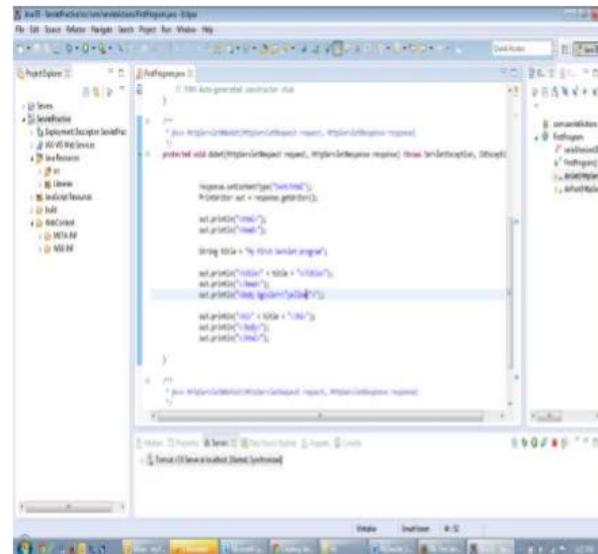
Markers Properties DB Servers Data Source Explorer Snippets

3 items

Description	Resource	Path	Location	Type
Java Task (0 items)				

Writable Smart Insert 1:1

# Source Code for First Servlet Program Example



```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class First_Servlet_Program extends HttpServlet {

    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws IOException, ServletException
    {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
        out.println("<html>");
        out.println("<head>");
        out.println("<title> First Servlet Program!</title>");
        out.println("</head>");
        out.println("<body>");
        out.println("<h1> Welcome To First Servlet Program");
        out.println("!!!</h1>");
        out.println("</body>");
        out.println("</html>");
    }
}
```

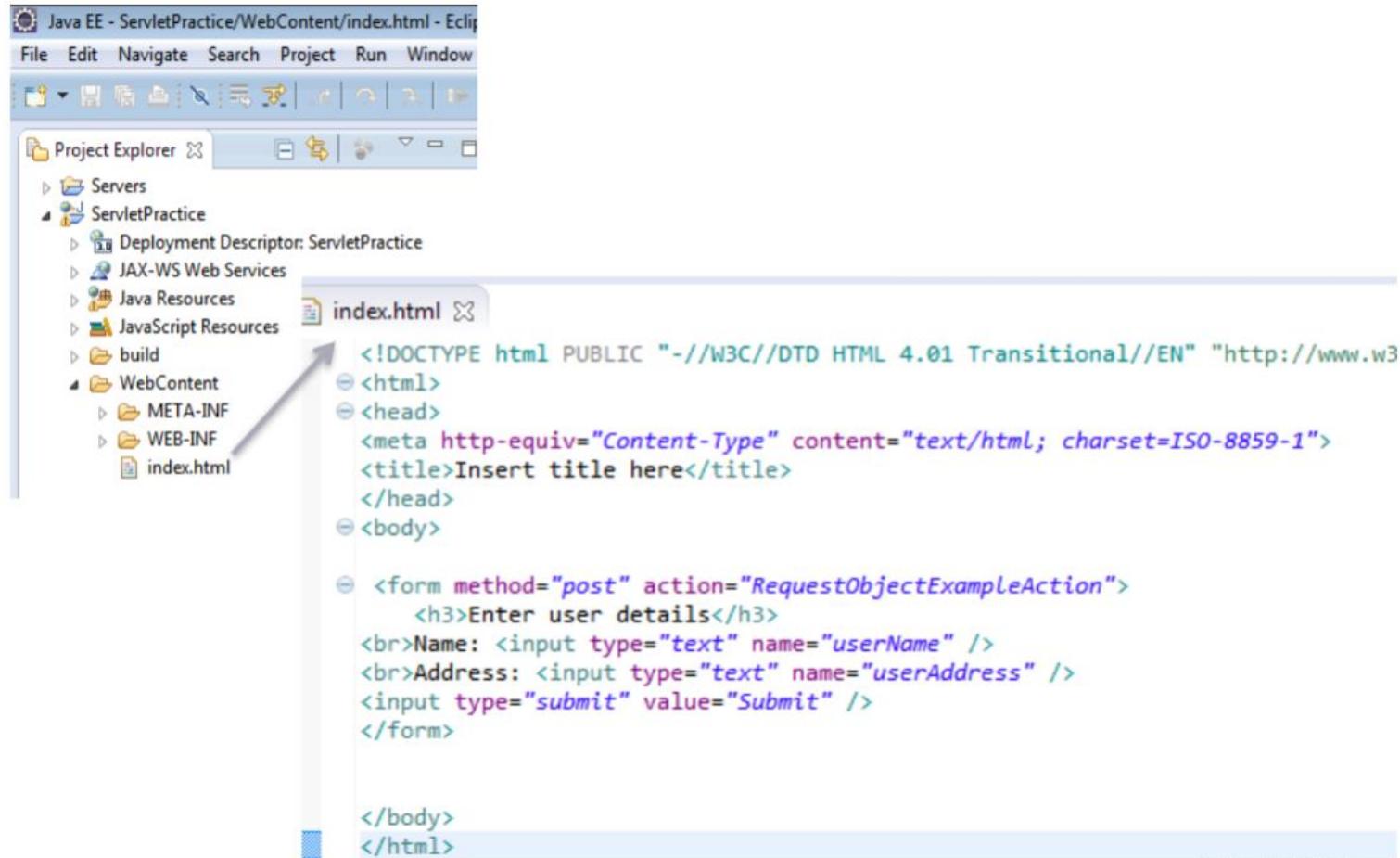
## Output response



# Request Object



## Create HTML file – index.html



The screenshot shows the Eclipse IDE interface with the title bar "Java EE - ServletPractice/WebContent/index.html - Eclipse". The menu bar includes File, Edit, Navigate, Search, Project, Run, and Window. Below the menu is a toolbar with various icons. The "Project Explorer" view on the left shows a project named "ServletPractice" with its structure: Servers, Deployment Descriptor: ServletPractice, JAX-WS Web Services, Java Resources, JavaScript Resources, build, WebContent (containing META-INF, WEB-INF, and index.html). A blue arrow points from the "index.html" entry in the Project Explorer to the "index.html" tab in the central editor area. The code editor displays the following HTML content:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<form method="post" action="RequestObjectExampleAction">
<h3>Enter user details</h3>
<br>Name: <input type="text" name="userName" />
<br>Address: <input type="text" name="userAddress" />
<input type="submit" value="Submit" />
</form>

</body>
</html>
```

---

## Request object Parameters – Form Data

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

    PrintWriter out = response.getWriter();

    response.setContentType("text/html");
        out.println("<html>");
        out.println("<head>");
        out.println("<title> Request Object example </title>");
        out.println("</head>");

        out.println("<body bgcolor=\"yellow\">");

        out.println("<h1>"+"Request object Parameters: " + "</h1>"+"<br>");

        out.println("<h2>" + "User Details" + "</h2>");

        Enumeration<String> reqParams = request.getParameterNames();

        while (reqParams.hasMoreElements()) {
            String name = (String)reqParams.nextElement();
            String value = request.getParameter(name);
            out.println("<b> "+name + "</b>"+" " + " = " +value+"<br>");
        }

        out.println("The Name you entered was: " + request.getParameter("userName")+"<br>");
        out.println("The Address you entered was: " + request.getParameter("userAddress"));

        out.println("</body>");
        out.println("</html>");

}
```

## Request object Info

```
protected void doPost(HttpServletRequest request, HttpServletResponse response) throws  
ServletException, IOException {  
  
    PrintWriter out = response.getWriter();  
  
    response.setContentType("text/html");  
    out.println("<html>");  
    out.println("<head>");  
    out.println("<title> Request Object example </title>");  
    out.println("</head>");  
  
    out.println("<body bgcolor=\"yellow\">");  
  
    out.println("<h1>"+"Request object Info: " + "</h1>"+<br>");  
    out.println("<b>Method:</b> " + request.getMethod()+"<br>");  
    out.println("<b>Request URI: </b>" + request.getRequestURI()+"<br>");  
    out.println("<b>Protocol: </b>" + request.getProtocol()+"<br>");  
    out.println("<b>PathInfo: </b>" + request.getPathInfo()+"<br>");  
    out.println("<b>Remote Address: </b>" + request.getRemoteAddr()+"<br>");  
  
    out.println("</body>");  
    out.println("</html>");  
  
}
```

# Request object Headers details

```
protected void doPost(HttpServletRequest request, HttpServletResponse response) throws  
ServletException, IOException {  
  
    PrintWriter out = response.getWriter();  
  
    response.setContentType("text/html");  
    out.println("<html>");  
    out.println("<head>");  
    out.println("<title> Request Object example </title>");  
    out.println("</head>");  
  
    out.println("<body bgcolor=\"yellow\">");  
  
    out.println("<h1>"+"Request object Headers details: " + "</h1>"+"<br>");  
    Enumeration<String> reqHeaders = request.getHeaderNames();  
    out.println("<table border=0>");  
  
    while (reqHeaders.hasMoreElements()) {  
        String name = (String)reqHeaders.nextElement();  
        String value = request.getHeader(name);  
        out.println("<tr><td bgcolor=\"#CCCCCC\">");  
        out.println("<b>" + name + "</b>" +" = " + value);  
        out.println("</td><td>");  
        out.println("</td></tr>");  
    }  
    out.println("</table>");  
  
    out.println("</body>");  
    out.println("</html>");
```

# Handling Form Data



## Handling Form Data

- Write a Servlet that retrieves form parameters from the HTML form
- Simpleform.html

```
<html>
<head><title>Simple Form</title></head>
<body>
    <form method="post" action="SimpleFormServlet">
        <h3>Enter user details</h3>
        <br>Name: <input type="text" name="userName" />
        <br>Address: <input type="text" name="userAddress" />
        <input type="submit" value="Submit" />
    </form>
</body>
```

## The getParameter() method

- **Syntax:** public String getParameter(String name)
- To get request parameters sent as an extra information with the request, invoke getParameter method of ServletRequest (HttpServletRequest extends ServletRequest)
  - Provide parameter name as an argument
  - Returns a string that contains URL-decoded value of first occurrence of that parameter name
    - If parameter exists but has no value, then an empty string is returned
    - If parameter does not exist, then null is returned
- Use this method when you are sure the parameter has only one value
- **Example:** String name = request.getParameter("userName");

## Example Servlet: Handling Form Data

- SimpleFormServlet's doPost method retrieves request parameters such as user's name and address having a single value from the form

```
public class SimpleFormServlet extends HttpServlet {  
    public void doPost(HttpServletRequest request, HttpServletResponse response)  
        throws IOException, ServletException {  
        response.setContentType("text/html");  
        PrintWriter out = response.getWriter();  
        String name = request.getParameter("userName");  
        String address = request.getParameter("userAddress");  
        out.println("<html>");  
        out.println("<h1>" + "User Details" + "</h1>");  
        out.println("<p>The Name you entered was: " + name + "</p>");  
        out.println("<p> The Address you entered was: " + address + "</p>");  
    }  
}
```

## Demo for Handling Simple Form Data

- Demonstrate a SimpleFormServlet with a doPost method that retrieves request parameters such as user's name and address having a single value from the form (getParameter method)

Address  <http://localhost:10000/ServletsModularization/Simpleform.html>

**Enter user details**

Name:

Address:

Address  <http://localhost:10000/ServletsModularization/SimpleFormServlet>

**User Details**

The Name you entered was: Anny

The Address you entered was: 24th Main Bangalore

---

## **Reason it out**

- What difference does it make if SimpleFormServlet used doGet method and accordingly method=“GET” in the html form?



---

## Form Data for different HTML Components

- Suppose a Job seeker Company needs basic information about the user's name, address, state, highest qualification and skills

[\*\*comp.html\*\*](#)

```
<html>
  <head><title>Information Details</title></head>
  <body>
    <form action="differentCompServlet" method=POST>
      <BR>Name: <input type=text name="name" />
      <BR>Address: <textarea name="address" rows=5 cols=20></textarea>
      <BR>State: <select name="state">
        <option value="Andhra Pradesh"> Andhra Pradesh </option>
        <option value="Karnataka"> Karnataka </option>
        <option value="Uttar Pradesh"> Uttar Pradesh</option>
      </select>
```

## Form Data for different HTML Components (Contd.).

[\*\*comp.html\*\*](#)

```
<BR><BR>Highest Qualification:<BR>
    Under Graduate<input type=radio name=qualification
    value="UG">
    Post Graduate<input type=radio name=qualification
    value="PG">
<BR><BR>Skills:<BR>
    Java<input type=checkbox name=skills value=Java>
    Servlets<input type=checkbox name=skills
    value=Servlets>
    JSPs<input type=checkbox name=skills value=JSPs>
    EJB 3.0<input type=checkbox name=skills value=EJB>
<BR><BR><input type=submit value=submit><input type=reset>
</form>
</body>
</html>
```

---

## **Methods: getParameterNames() and getParameterValues()**

- **Syntax:** public Enumeration getParameterNames()
  - Returns a full list of parameter names as an Enumeration of String objects, each String containing the name of a request parameter
  - Returns an empty Enumeration if the request has no parameters
- Use this method if a servlet has to get a full list of all request parameters
- **Syntax:** public String[ ] getParameterValues(String name)
  - Returns an array of String objects containing all values the given request parameter has
  - Returns null if the parameter does not exist
  - If the parameter has a single value, the array has a length of 1
- Use this method if a parameter has more than one value. *Ex: checkbox*

## Example Servlet: Listing different Form Data

- DifferentCompServlet's *doPost* method retrieves request parameters using *getParameterNames* and *getParameterValues*

```
public class DifferentCompServlet extends HttpServlet {  
    public void doPost(HttpServletRequest req, HttpServletResponse res)  
        throws ServletException, IOException {  
        res.setContentType("text/html");  
        PrintWriter pw = res.getWriter();  
        Enumeration e = req.getParameterNames();  
        // Get enumeration of parameter names  
  
        while(e.hasMoreElements()) {  
            String pname = (String) e.nextElement();  
            String pvalues[] = req.getParameterValues(pname);  
            pw.println(pname+ " : ");  
            // print parameter values by iterating through array  
            for(int count = 0; count < pvalues.length; count++)  
            {  
                pw.println(pvalues[count]);  
            }  
            pw.println("<br>");  
        }  
        pw.close();    }    }
```

## Demo for Handling Different Form Data

- Demonstrate a DifferentFormServlet with a doPost method that retrieves request parameters of various form data using getParameterNames and getParameterValues

The image consists of two side-by-side screenshots of web browser windows.

**Left Screenshot:** A form titled "comp.html" is displayed. It contains the following fields:

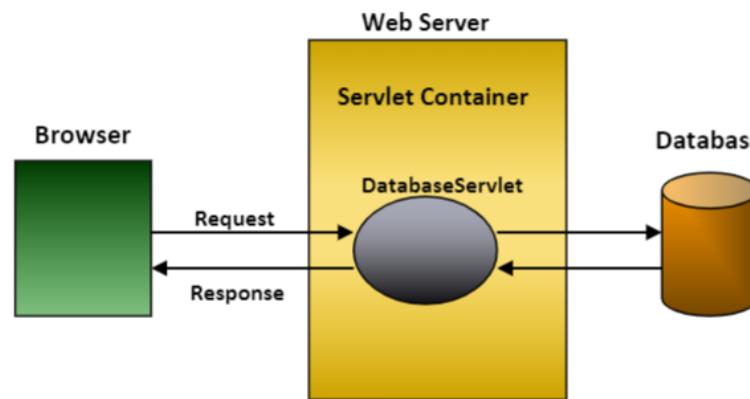
- Name:
- Address:  
12th Cross  
Sector 6  
Bangalore
- Address:
- State:
- Highest Qualification:  
Under Graduate  Post Graduate
- Skills:  
Java  Servlets  JSPs  EJB 3.0

**Right Screenshot:** A response page titled "differentCompServlet" shows the request parameters:

address : 12th Cross Sector 6 Bangalore  
skills : Java Servlets  
name : Harry  
qualification : PG  
state : Karnataka

## Using JDBC in a Servlet

- A servlet can retrieve information from a database or perform update/delete/insert queries to/from a database



## Demo for accessing database

- A servlet to display records from database table

```
import java.sql.*;  
import javax.servlet.*;  
import javax.servlet.http.*;  
import java.io.*;  
public class DatabaseServlet extends HttpServlet {  
Connection con;  
PreparedStatement st;  
Statement stmt;  
ResultSet rs;  
public void init(ServletConfig config) throws ServletException {  
try {  
Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");  
con = DriverManager.getConnection("Jdbc:Odbc:vdsn2", "scott", "tiger");  
System.out.println("Connected..");  
} catch (Exception e) {  
  
System.out.println("Error in connection.."); } }
```

## Demo for accessing database (Contd.).

```
public void doGet(HttpServletRequest req, HttpServletResponse res) throws
    ServletException, IOException {
    res.setContentType("text/html");
    PrintWriter pw = res.getWriter();
    //Displaying records
    try {
        stmt = con.createStatement();
        rs = stmt.executeQuery("select * from books");

        pw.println("Displaying Book Records...");
        while (rs.next()) {
            pw.println("<p>" + rs.getInt(1) + " " + rs.getString(2) + " " + rs.getString(3));
        }
    } catch (Exception e) {
        System.out.println("Error..." + e);
    } } }
```

---

## **Summary**

In this module, you were able to:

- Process parameters from HTML forms

---

## Quiz

1. The doGet() or doPost() method of a Servlet are invoked by -----
  1. init() method
  2. service() method
  3. destroy() method
  
- ----- is the deployment descriptor file for Servlets
  1. servlet-config.xml
  2. web.xml
  3. struts-config.xml



**Thank You**