GET and POST Requests

Request & Response Objects

Agenda

1. doGet and doPost methods
2. HttpServletRequest & HttpServletResponse
3. Create & Deploy Simple application
4. Accessing database

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

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

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)

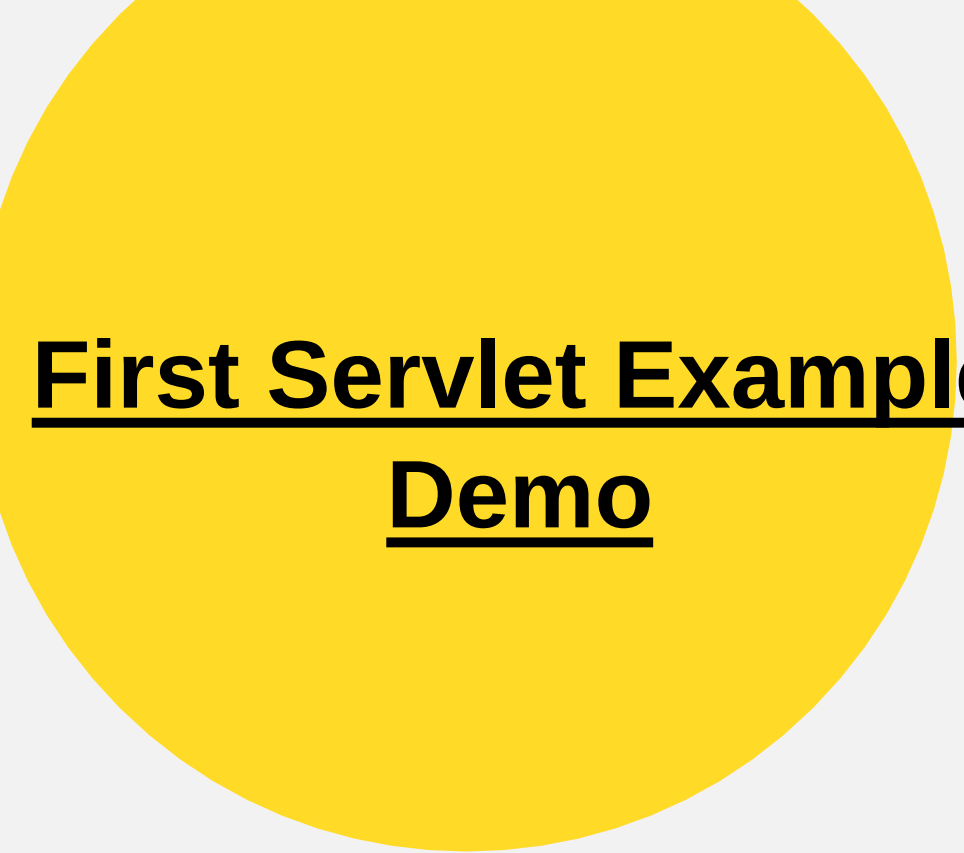
HttpServletResponse interface

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

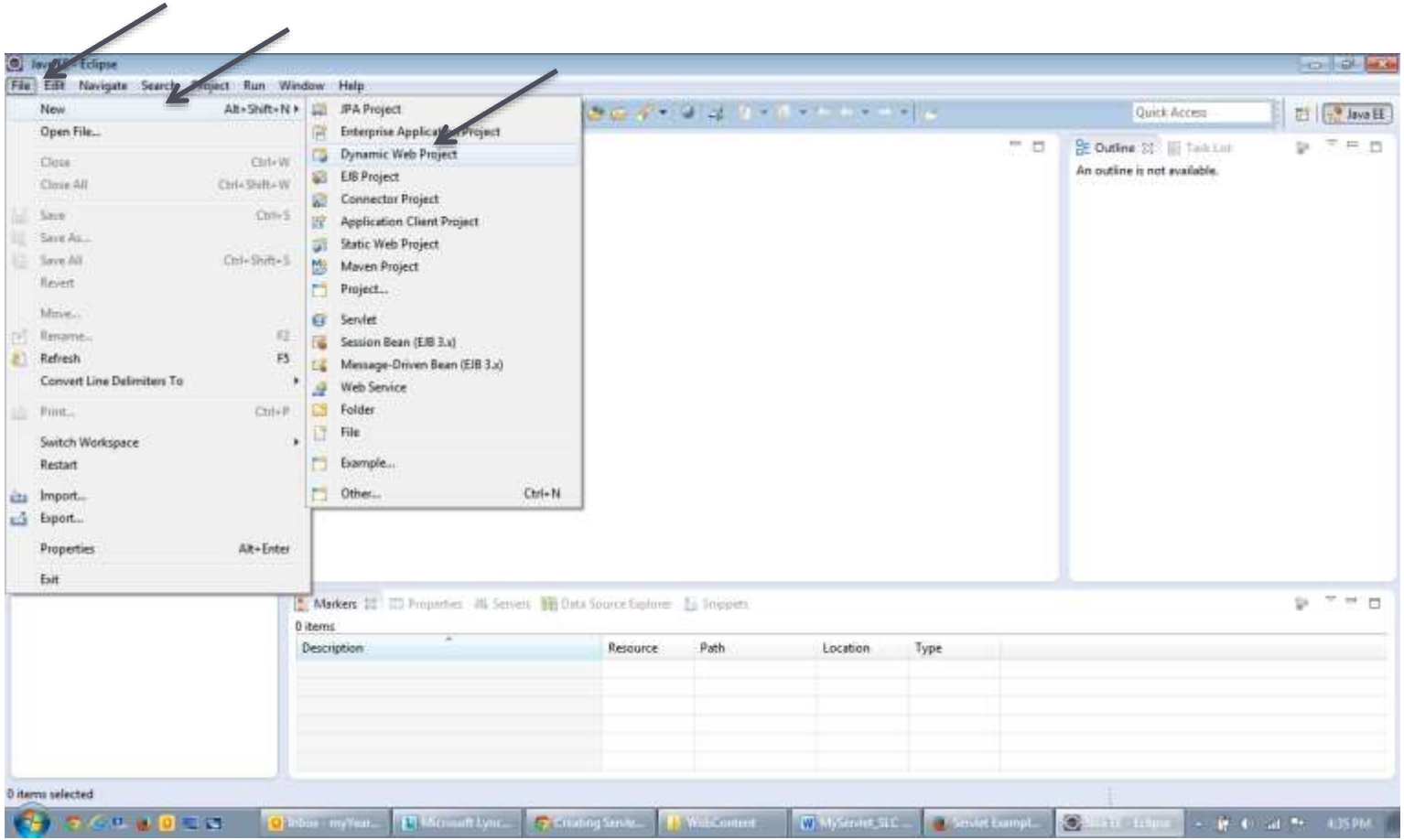
    For example: response headers and HTTP status codes
  - Also enables you to obtain a PrintWriter object for writing output back to the client

- Methods:
  - getWriter
  - setContentType
  - sendRedirect

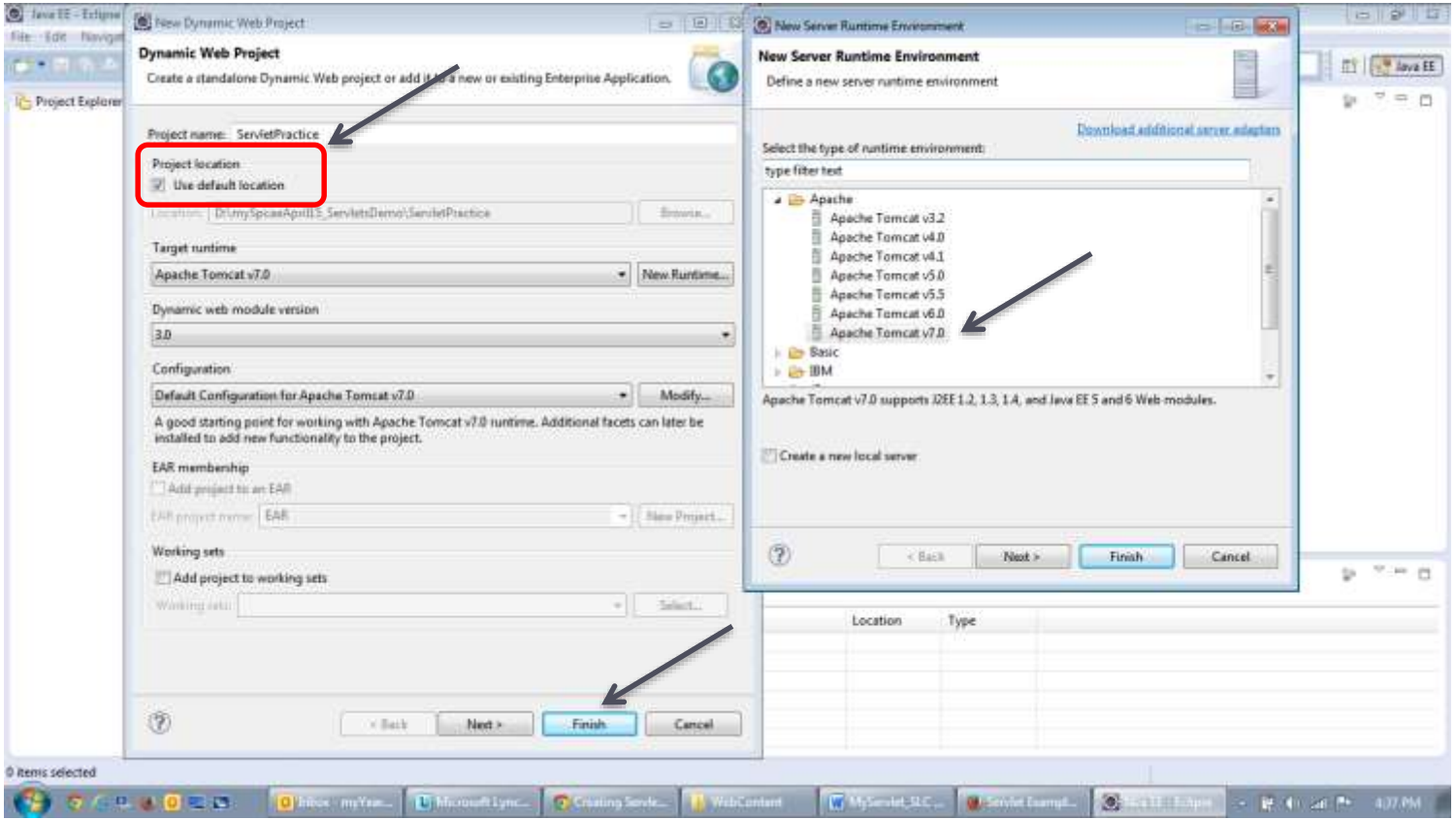
First Servlet Example Demo



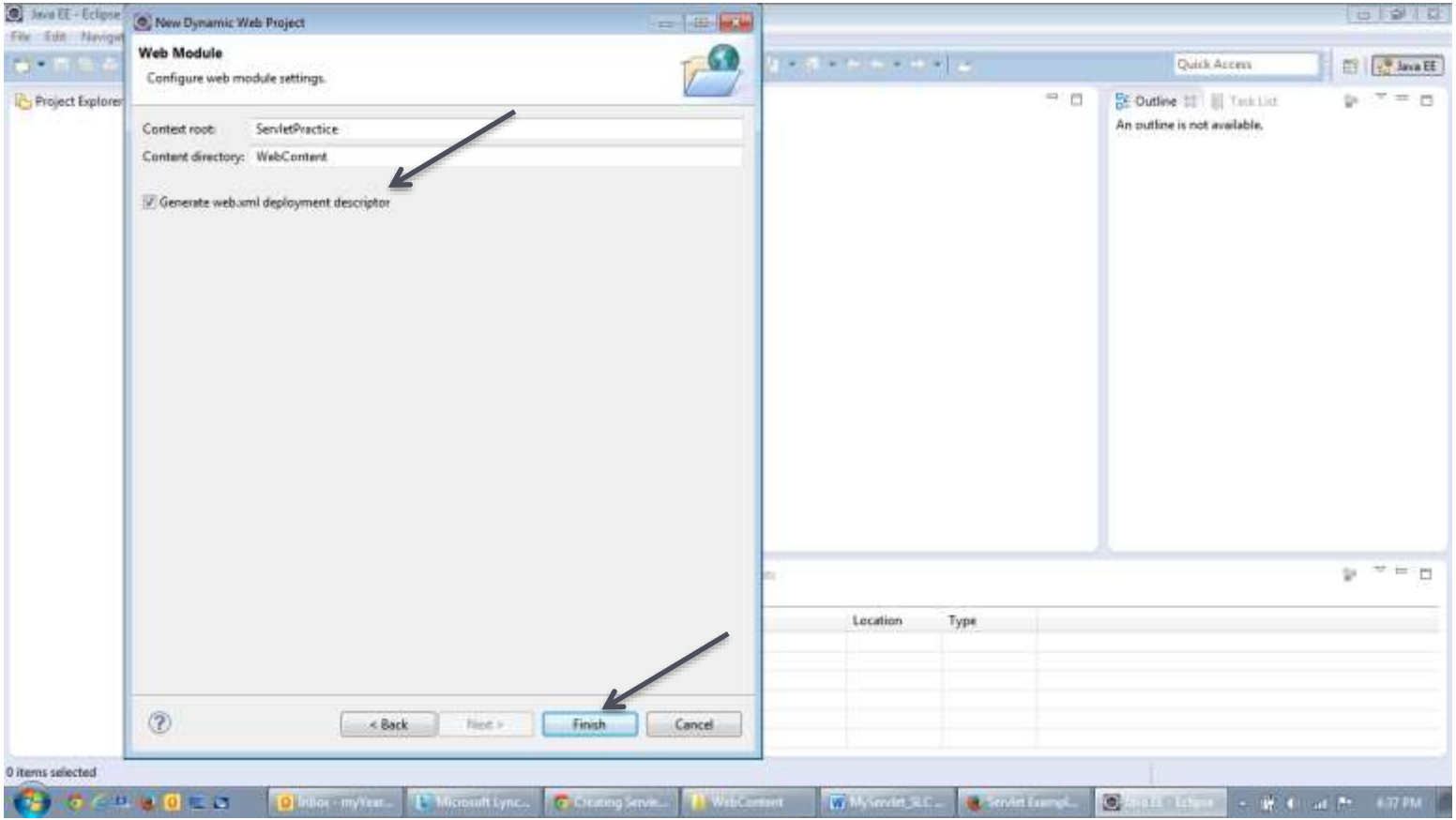
Create the dynamic web project



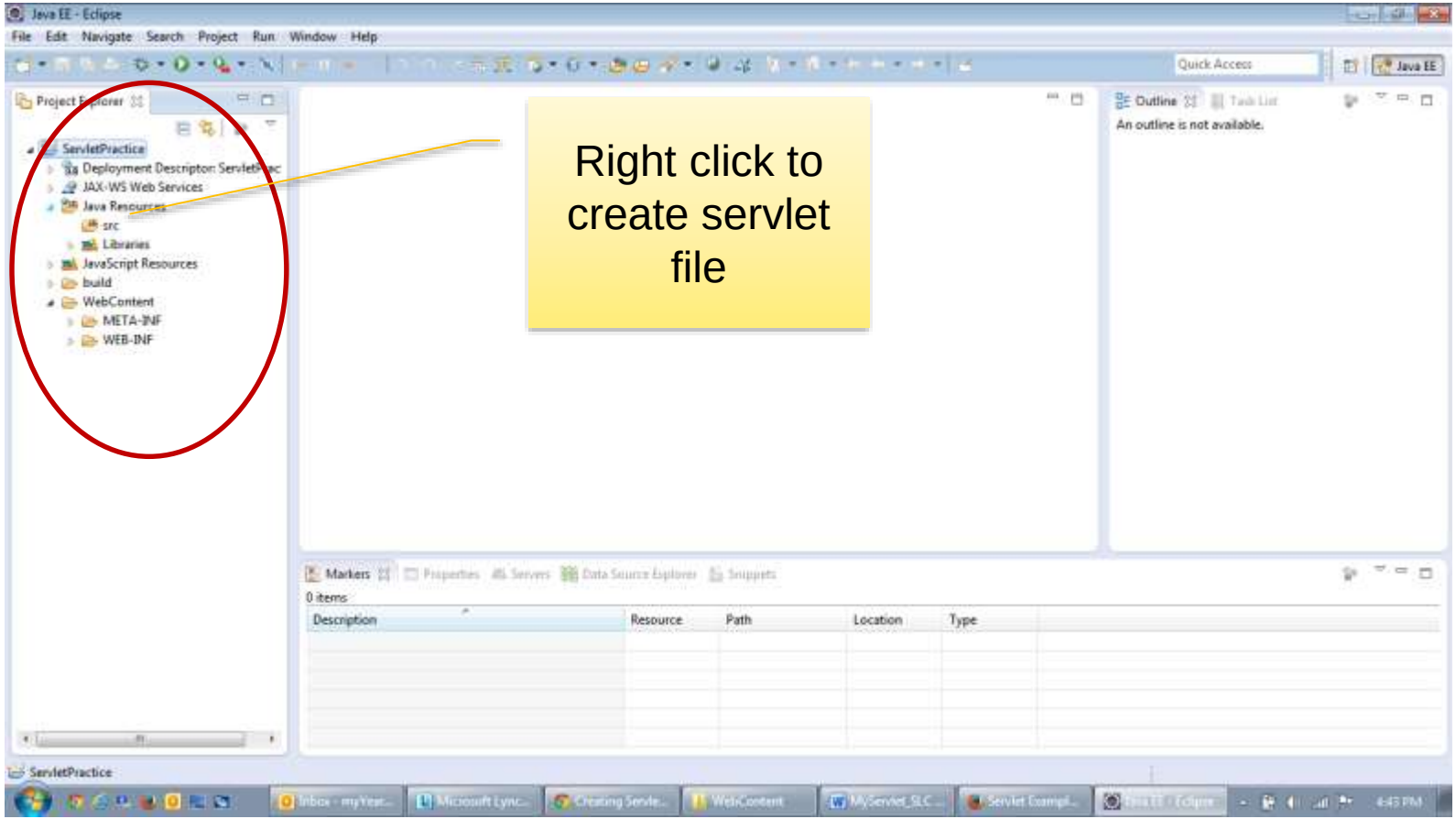
Configure tomcat server in Eclipse? (One time Requirement)



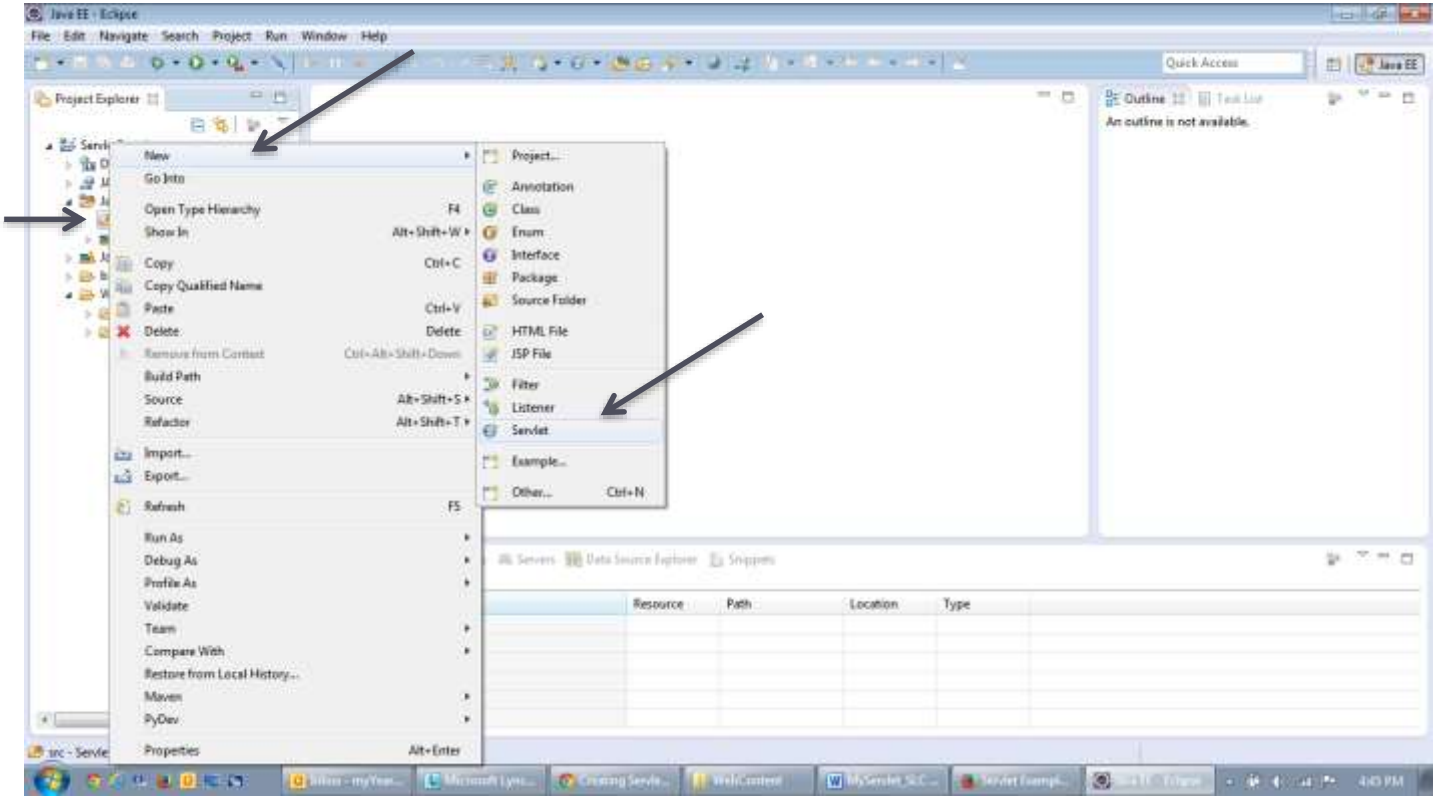
Enable web.xml deployment descriptor



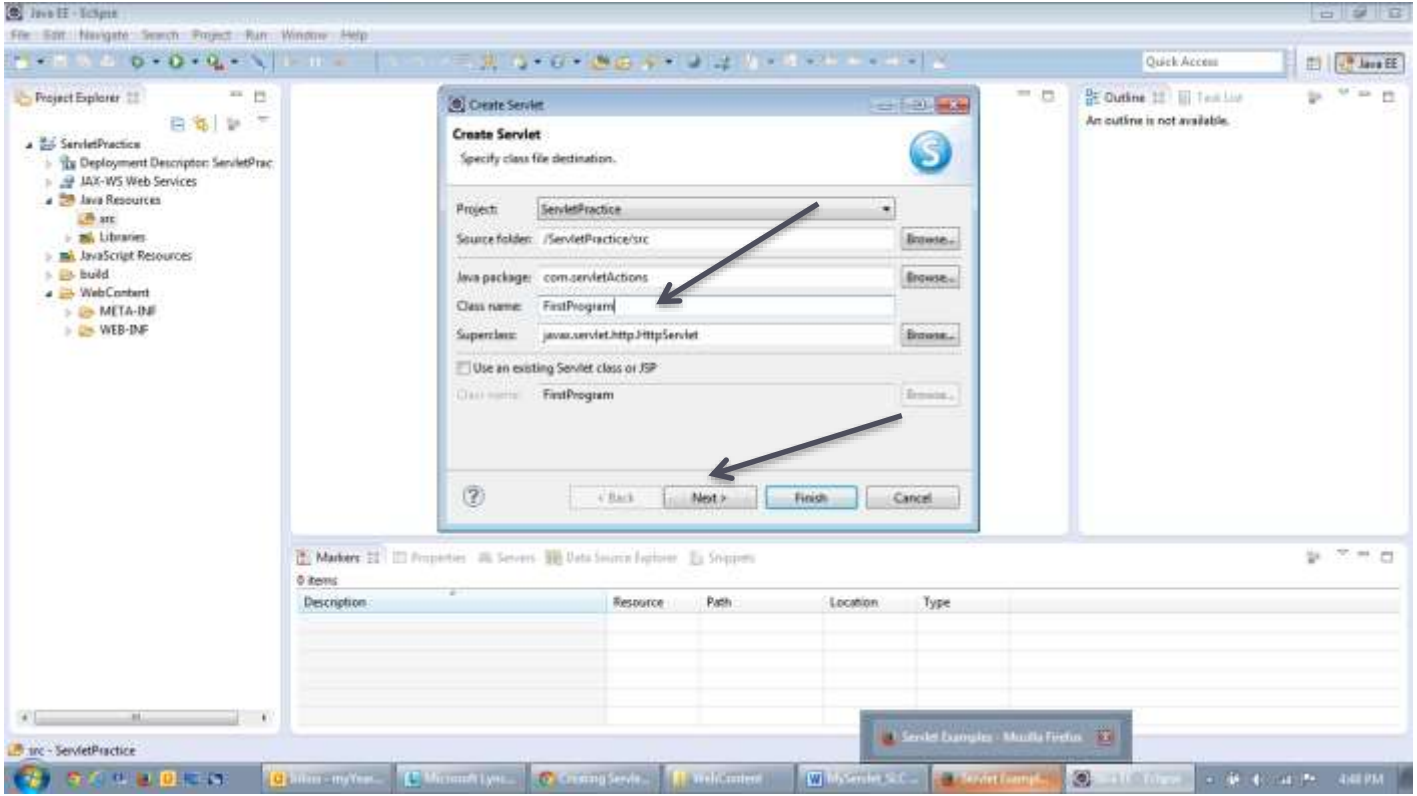
Create the servlet

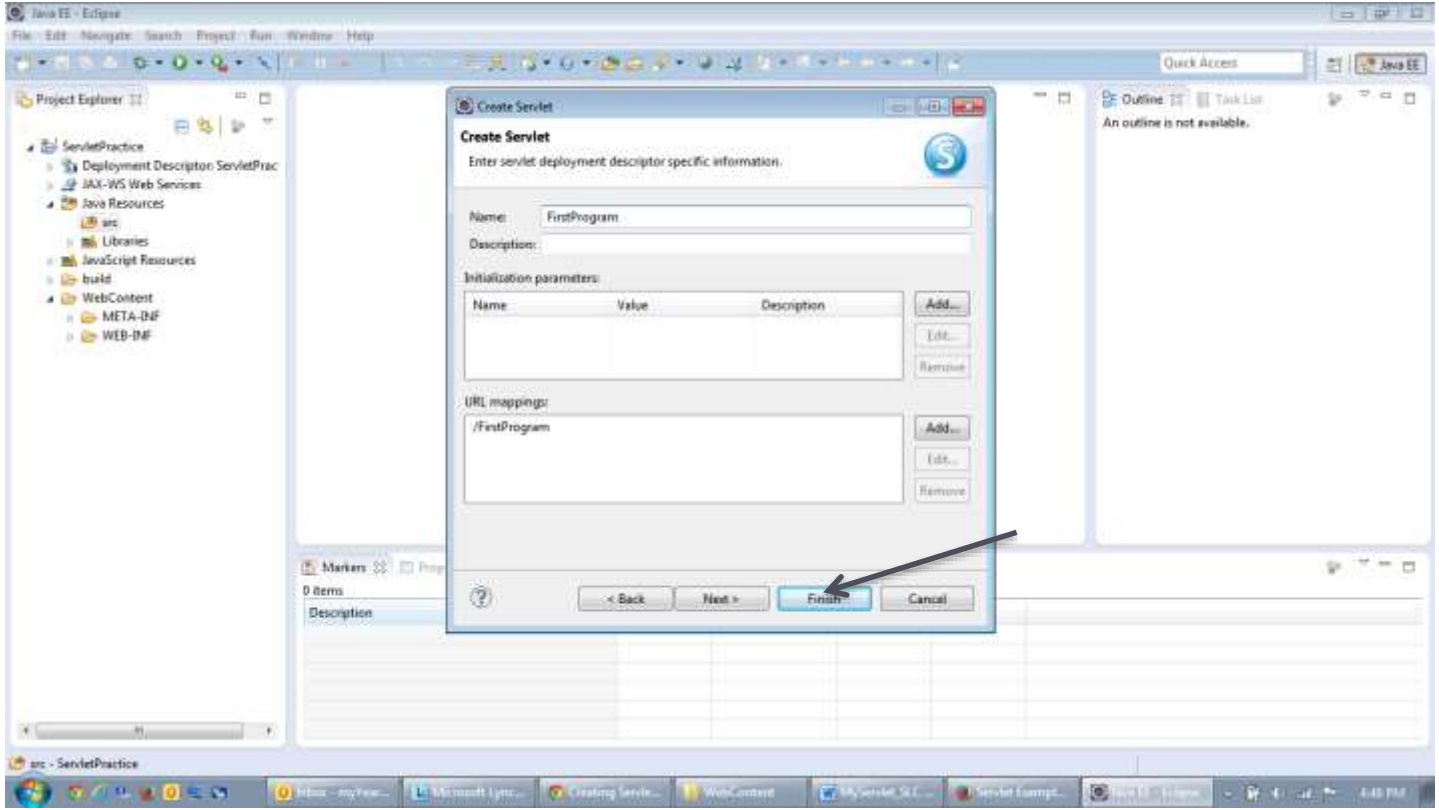


Select the servlet option

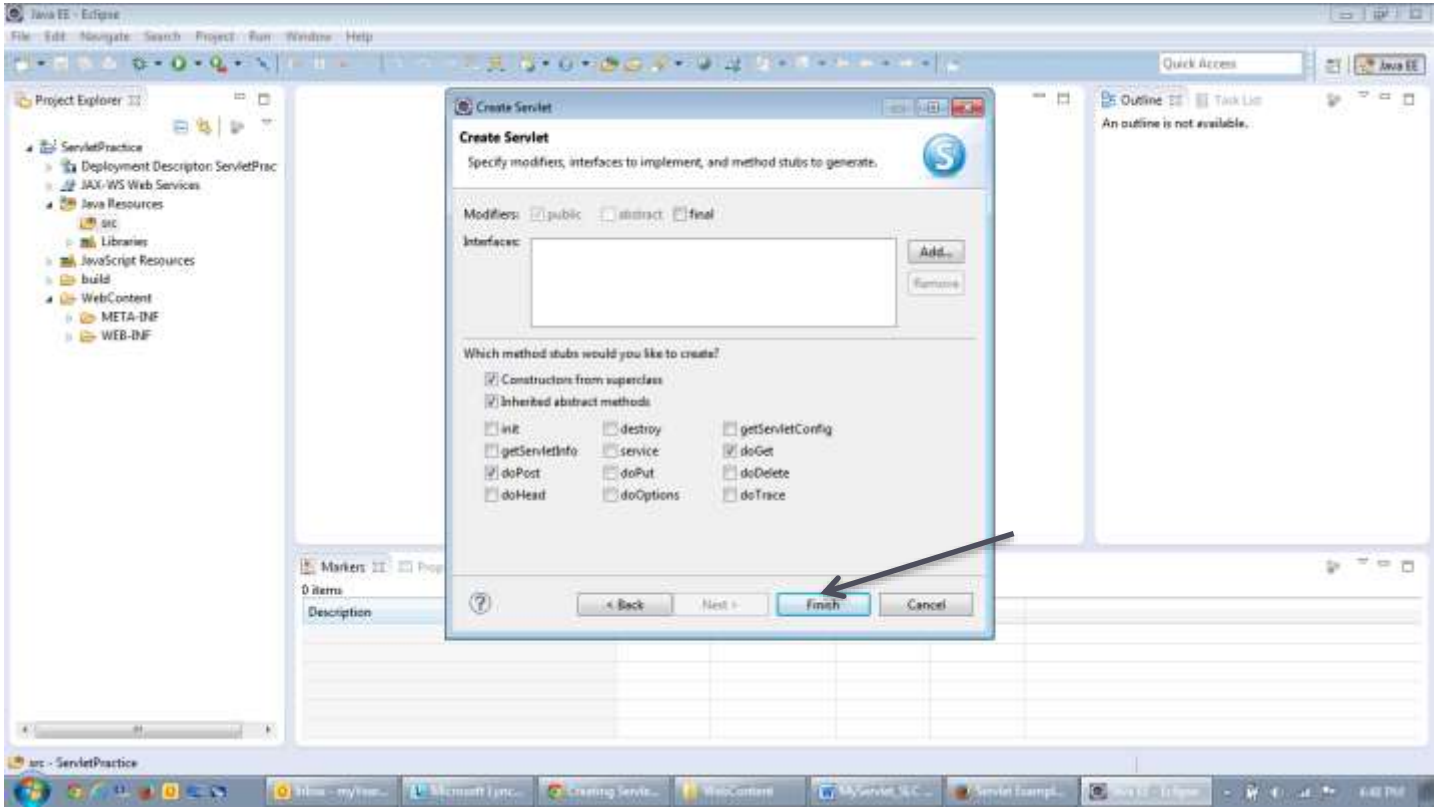


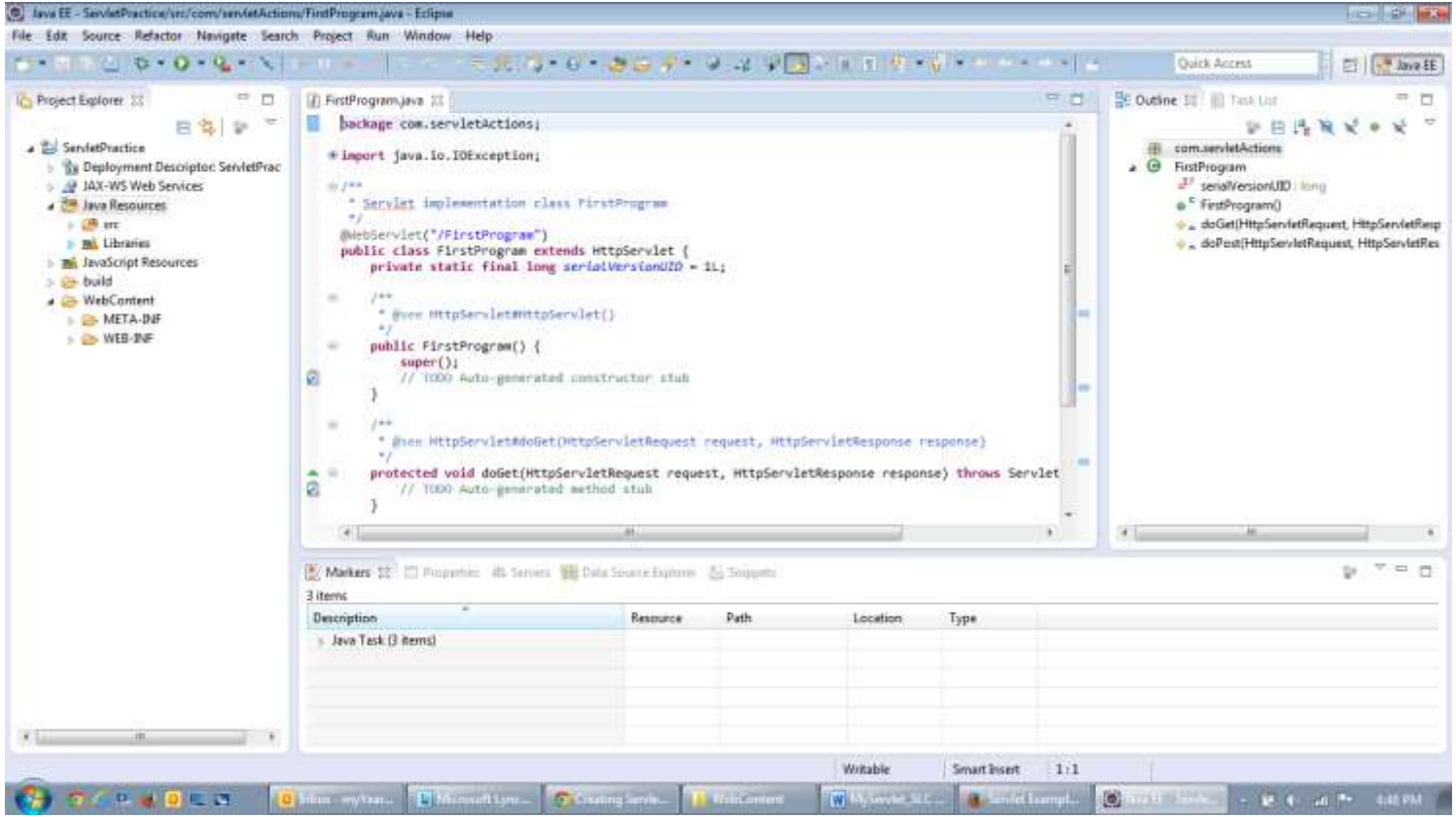
Type class name



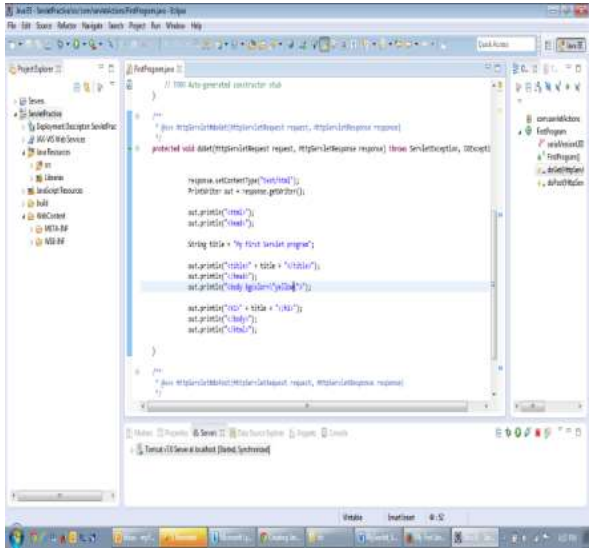

Create Servlet
Create Servlet
Enter servlet deployment descriptor specific information.
Name: FirstProgram
Description:
Initialization parameters:
Name
Value
Description
Add...
Edit...
Remove
URL mappings:
/FirstProgram
Add...
Edit...
Remove
< Back
Next >
Finish
Cancel
Project Explorer
ServletPractice
Deployment Descriptor: ServletPrac
JAX-WS Web Services
Java Resources
src
Libraries
JavaScript Resources
build
WebContent
META-INF
WEB-INF
Outline
An outline is not available.
Markers
0 items
Description

Select Finish



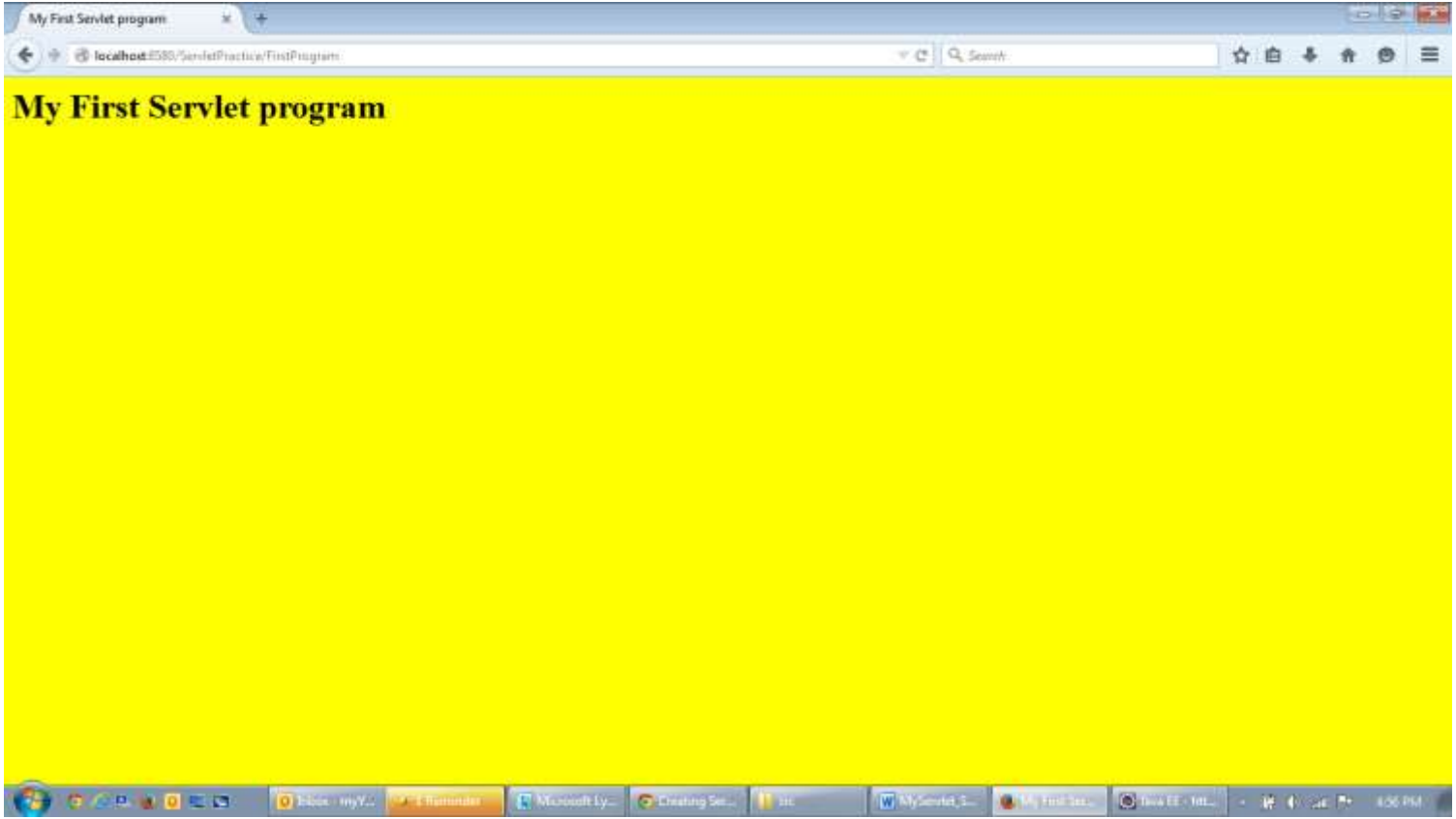

Java EE - ServletPractice/src/com/servletActions/FirstProgram.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Java EE
Project Explorer
ServletPractice
Deployment Descriptor: ServletPrac
JAX-WS Web Services
Java Resources
src
Libraries
JavaScript Resources
build
WebContent
META-INF
WEB-INF
FirstProgram.java
package com.servletActions;
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 Servlet
// TODO Auto-generated method stub
}
Outline
Task List
com.servletActions
FirstProgram
serialVersionUID long
FirstProgram()
doGet(HttpServletRequest, HttpServletResp
doPost(HttpServletRequest, HttpServletRes
Markers
Properties
Servers
Data Source Explorer
Snippets
3 items
Description
Resource
Path
Location
Type
Java Task (3 items)
Writable
Smart Insert
1 : 1

Source Code for First_Servlet_Program Example

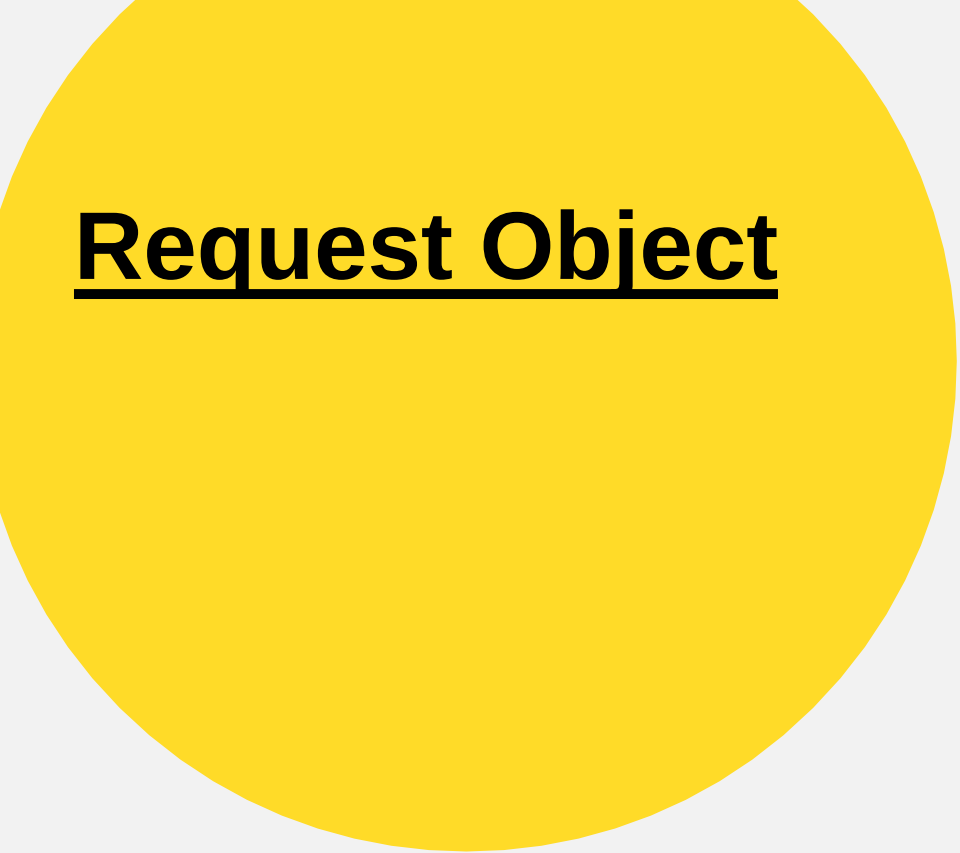


```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

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
!!!</h1>");
        out.println("</body>");
        out.println("</html>");
    }
}
```

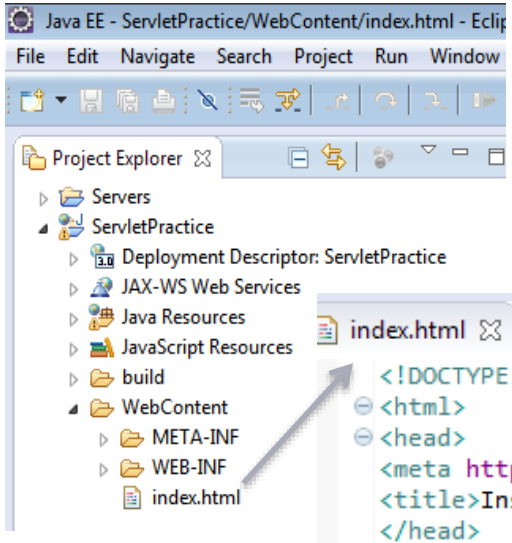
Output response



Request Object



Create HTML file – index.html



index.html

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3
<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>");

}
```

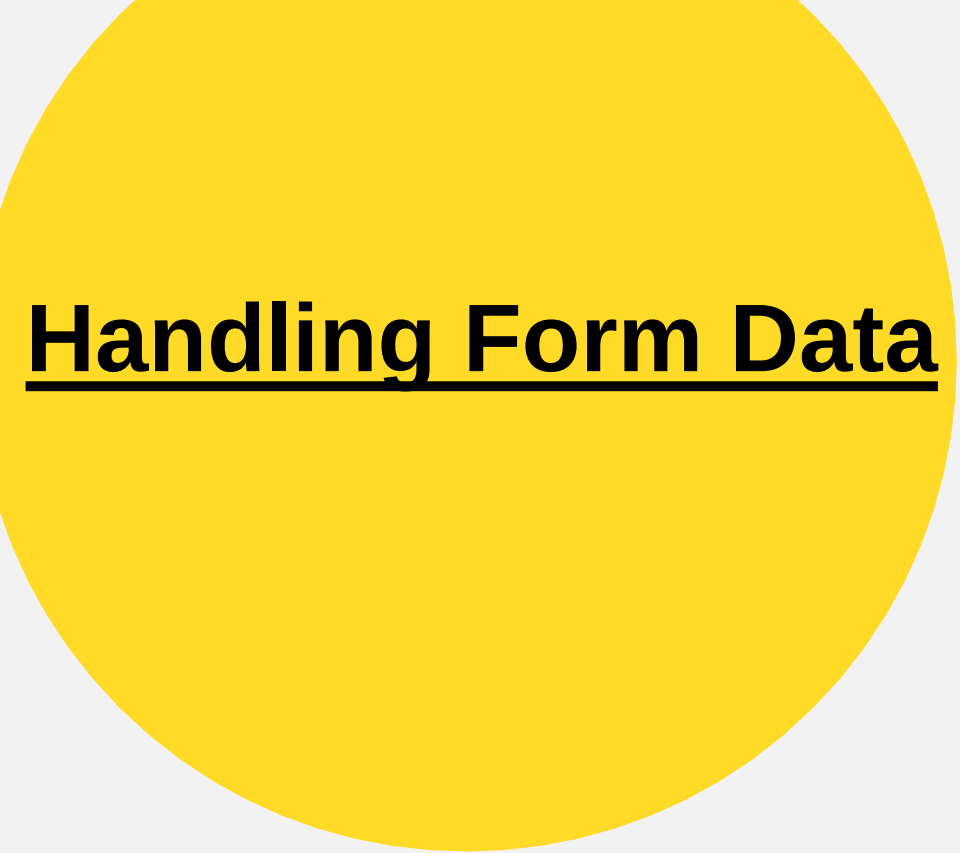
Request object Info

```
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");

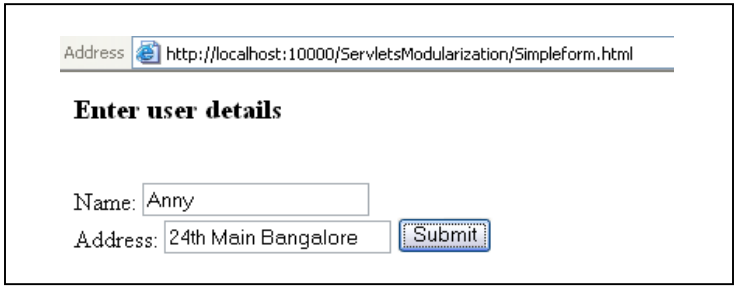
Example Servlet: Handling Form Data

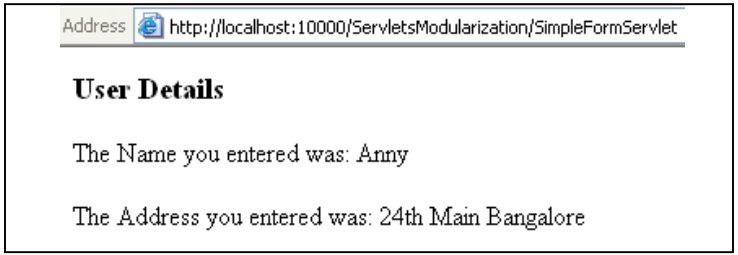
- SimpleFormServlet's doPost method retrieves request parameters such as user’s name and address having a single value from the form

```
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)





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

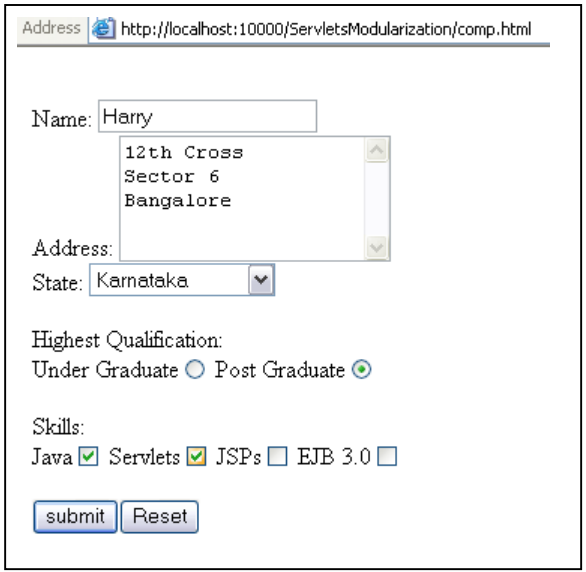
Example Servlet: Listing different Form Data

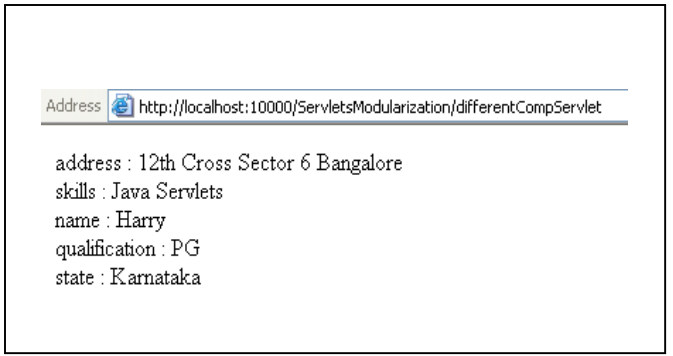
- DifferentCompServlet's *doPost* method retrieves request parameters using getParameterNames and getParameterValues

```
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

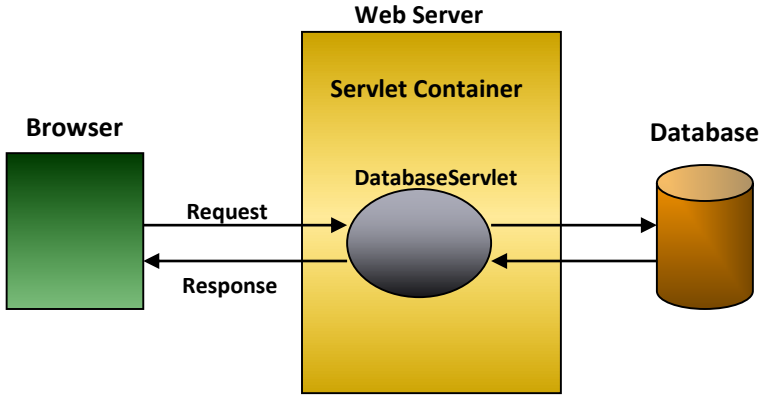
- Demonstrate a DifferentFormServlet with a doPost method that retrieves request parameters of various form data using getParameterNames and getParameterValues





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