

**UNIVERSITY OF MUMBAI**



**Teacher's Reference Manual**

**Subject: Enterprise Java**

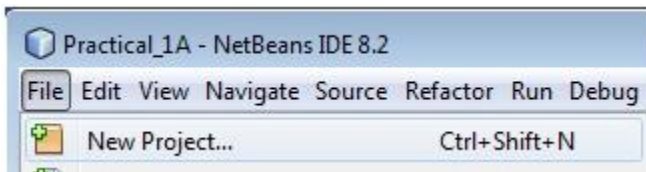
with effect from the academic year

2018 – 2019

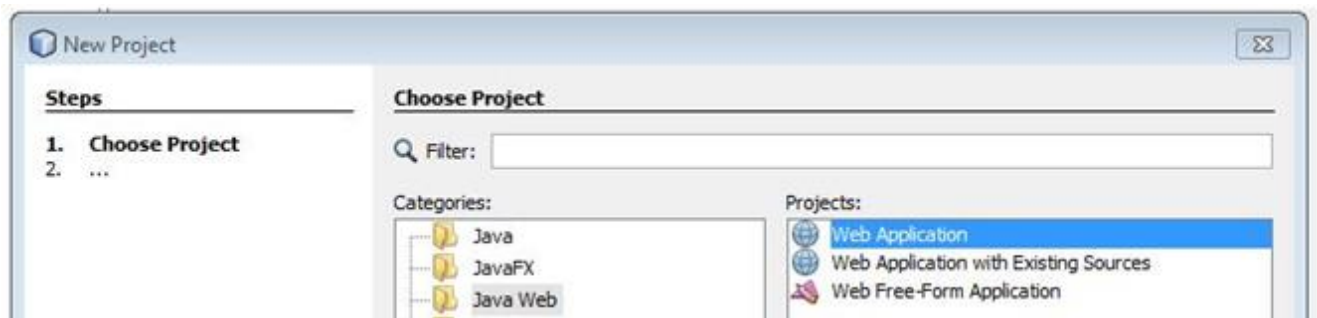
**Requirements:**

1. JDK 8u181
2. Netbeans 8.1 or higher
3. MySql 5.5 or higher

**1a.** Create a simple calculator application using servlet.



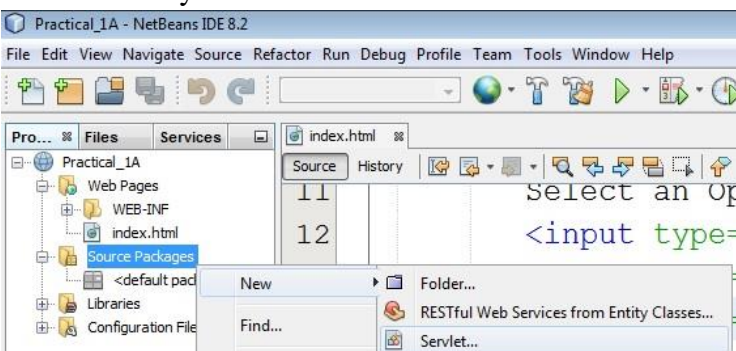
**Create a new project**



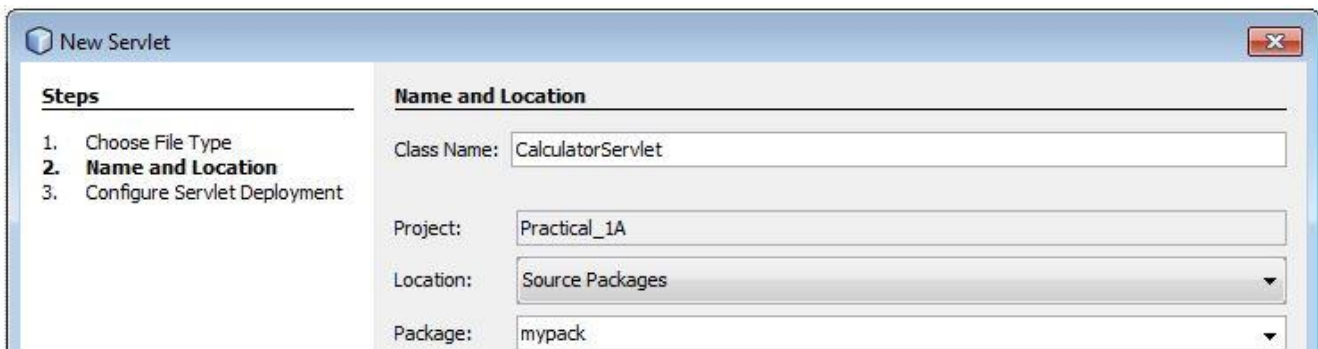
**Select java web → web Application**

**index.html**

```
<html><head><title>Calculator App</title></head><body>
<form action="CalculatorServlet" >
    Enter First Number      <input type="text" name="txtN1" ><br>
    Enter Second Number    <input type="text" name="txtN2" ><br>
    Select an Operation
    <input type="radio" name="opr" value="+">ADDITION
    <input type="radio" name="opr" value="-">SUBTRACTION
    <input type="radio" name="opr" value="*">MULTIPLY
    <input type="radio" name="opr" value="/">DIVIDE <br>
    <input type="reset">
    <input type="submit" value="Calculate" >
</form></body></html>
```



**Add a new Servlet to source package**



**Name the servlet and package**



**Check “Add information to deployment descriptor” to add servlet into web.xml  
But preferably use annotation.**

### CalculatorServlet.java

```
package mypack;
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 CalculatorServlet extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Servlet CalculatorServlet</title></head><body>");
        double n1 = Double.parseDouble(request.getParameter("txtN1"));
        double n2 = Double.parseDouble(request.getParameter("txtN2"));
        double result = 0;
        String opr=request.getParameter("opr");
        if(opr.equals("+")) result=n1+n2;           if(opr.equals("-")) result=n1-n2;
        if(opr.equals("*")) result=n1*n2;           if(opr.equals("/")) result=n1/n2;
        out.println("<h1> Result = "+result);      out.println("</body></html>");} }
}
```



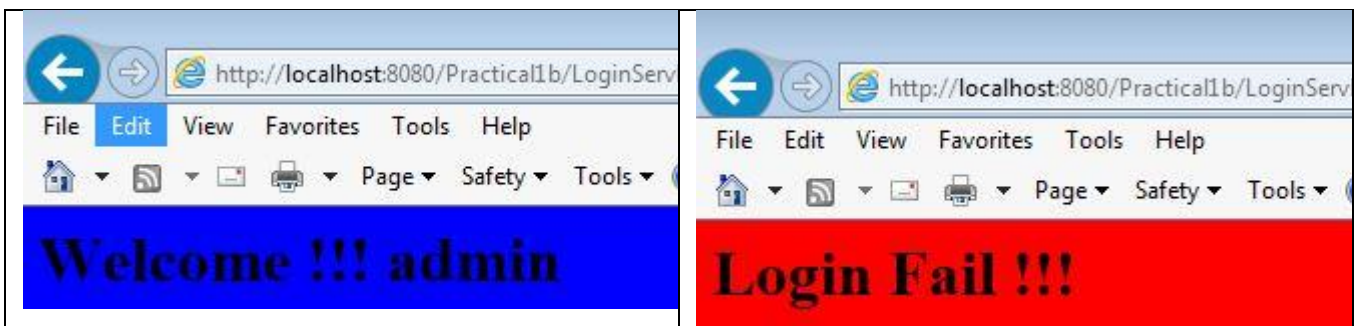
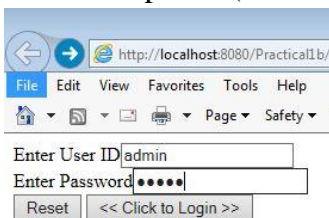
**1b.** Create a servlet for a login page. If the username and password are correct then it says message "Hello <username>" else a message "login failed"

### index.html

```
<html><head><title>Login Form</title></head>
<form action="LoginServlet" >
    Enter User ID<input type="text" name="txtId"><br>
    Enter Password<input type="password" name="txtPass"><br>
<input type="reset"><input type="submit" value=" Click to Login " ></form></html>
```

### LoginServlet.java

```
package mypack;
import java.io.*;
import javax.servlet.ServletException;
import javax.servlet.http.*;
public class LoginServlet extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head><title>Servlet LoginServlet</title></head>");
    String uname = request.getParameter("txtId");
    String upass = request.getParameter("txtPass");
    if(uname.equals("admin") && upass.equals("12345")){
    out.println("<body bgcolor=blue >");
    out.println("<h1> Welcome !!! "+uname+"</h1>");
    }
    else{
    out.println("<body bgcolor=red >");out.println("<h1> Login Fail !!! </h1>");
    }
    out.println("</body></html>");}}
```



**1c.** Create a registration servlet in Java using JDBC. Accept the details such as Username, Password, Email, and Country from the user using HTML Form and store the registration details in the database.

### MySql queries

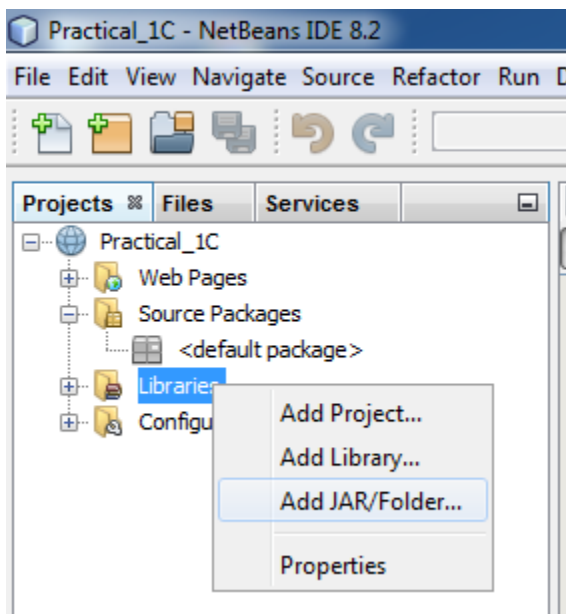
create database LoginDB;

use LoginDB;

create table user(username varchar(20) PRIMARY KEY, password varchar(20), email varchar(20), country varchar(20));

insert into user values ('admin','admin','admin@admin.com','India');

select \* from user;



- Add jar file → <<Netbean Folder>> \ide\modules\ext\mysql-connector-java-5.1.23-bin.jar

index.html

```
<html><head><title>Registration Page</title></head>
<body>
<form action="RegisterServlet" >
<H1>Welcome to Registration page</H1>
    Enter User Name    <input type="text" name="txtUid"><br>
    Enter Password     <input type="password" name="txtPass"><br>
    Enter Email        <input type="text" name="txtEmail" ><br>
    Enter Country      <input type="text" name="txtCon" ><br>
<input type="reset" ><input type="submit" value="REGISTER" >
</form>
</body>
```

&lt;/html&gt;

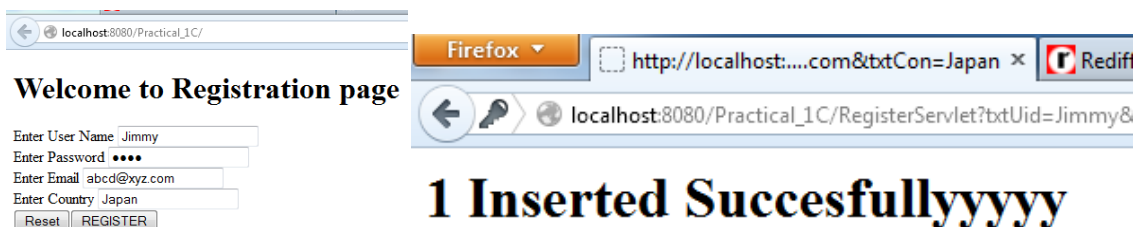
**RegisterServlet.java**

```

package mypack;
import java.io.*;
import java.sql.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class RegisterServlet extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        String id = request.getParameter("txtUid");
        String ps = request.getParameter("txtPass");
        String em = request.getParameter("txtEmail");
        String co = request.getParameter("txtCon");
        try{
            Class.forName("com.mysql.jdbc.Driver");
            Connection con =DriverManager.getConnection("jdbc:mysql://localhost:3306/logindb");
            PreparedStatement pst = con.prepareStatement("insert into user values(?,?,?,?)");
            pst.setString(1,id);
            pst.setString(2,ps);
            pst.setString(3,em);
            pst.setString(4,co);
            int row = pst.executeUpdate();
            out.println("<h1>"+row+ " Inserted Succesfullyyyyyy");
        }catch(Exception e){out.println(e);}
    }
}

```



#	username	password	email	country
1	admin	admin	admin@admin.com	India
2	Jimmy	abcd	abcd@xyz.com	Japan

**2a.** Using Request Dispatcher Interface create a Servlet which will validate the password entered by the user, if the user has entered "Servlet" as password, then he will be forwarded to Welcome Servlet else the user will stay on the index.html page and an error message will be displayed.

#### **index.html**

```
<html><head><title>Login Form</title></head>
<form action="LoginServlet" >
    Enter User ID<input type="text" name="txtId"><br>
    Enter Password<input type="password" name="txtPass"><br>
<input type="reset">
<input type="submit" value=" Click to Login " >
</form>
</html>
```

#### **LoginServlet.java**

```
package mypack;
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;
import javax.servlet.RequestDispatcher;
public class LoginServlet extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head>");
    out.println("<title>Servlet LoginServlet</title></head>");
    String uname = request.getParameter("txtId");
    String upass = request.getParameter("txtPass");
    if(uname.equals("admin") && upass.equals("servlet")){
    RequestDispatcher rd = request.getRequestDispatcher("WelcomeServlet");
    rd.forward(request, response);
    }
    else{
    out.println("<body bgcolor=red >");
    out.println("<h1> Login Fail !!! </h1>");
    RequestDispatcher rd = request.getRequestDispatcher("index.html");
    rd.include(request, response);
    }
    out.println("</body>");
    out.println("</html>");
    }
}
```



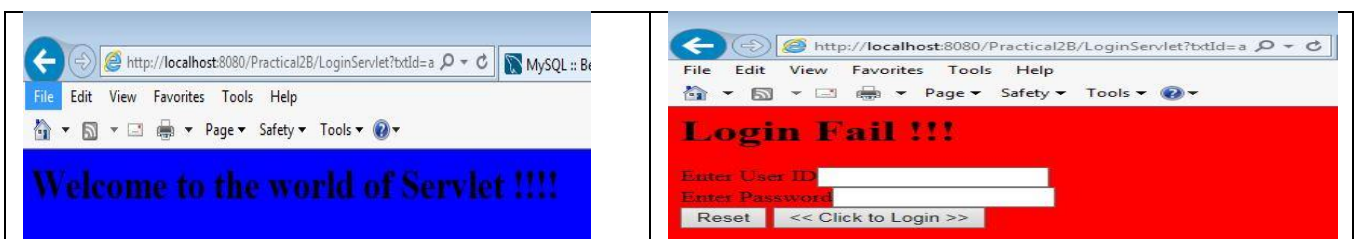
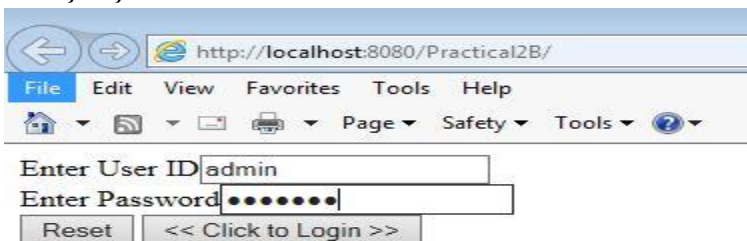
}

**WelcomeServlet.java**

```

package mypack;
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;
import javax.servlet.RequestDispatcher;
public class LoginServlet extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head>");
    out.println("<title>Servlet LoginServlet</title></head>");
    String uname = request.getParameter("txtId");
    String upass = request.getParameter("txtPass");
    if(uname.equals("admin") && upass.equals("servlet")){
    RequestDispatcher rd = request.getRequestDispatcher("WelcomeServlet");
    rd.forward(request, response);
    }
    else{
    out.println("<body bgcolor=red >");
    out.println("<h1> Login Fail !!! </h1>");
    RequestDispatcher rd = request.getRequestDispatcher("index.html");
    rd.include(request, response);
    }
    out.println("</body>");
    out.println("</html>");
    } }

```





**2b.** Create a servlet that uses Cookies to store the number of times a user has visited servlet.

**index.html**

```
<html>
<head><title>Cookie Demo</title></head>
<body>
<form action="Page1" >
    Enter Your Name <input type="text" name="txtName"><br>
<input type="submit" value="~~~ Click to Enter ~~~">
</form>
</body>
</html>
```

**Page1.java**

```
package mypack;
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;
import javax.servlet.http.Cookie;
public class Page1 extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head><title>Page1</title></head>");
    out.println("<body bgcolor=pink >");
    String uname = request.getParameter("txtName");
    out.println("<h1>~~~ Welcome "+uname+"</h1>");
    Cookie ck1 = new Cookie("username", uname);
    Cookie ck2 = new Cookie("visit", "1");
    response.addCookie(ck1); response.addCookie(ck2);
    out.println("<h1><a href=Page2 >Click to visit Page 2 </a></h1>");
    out.println("</body>");
    out.println("</html>");
    }
}
```

**Page2.java**

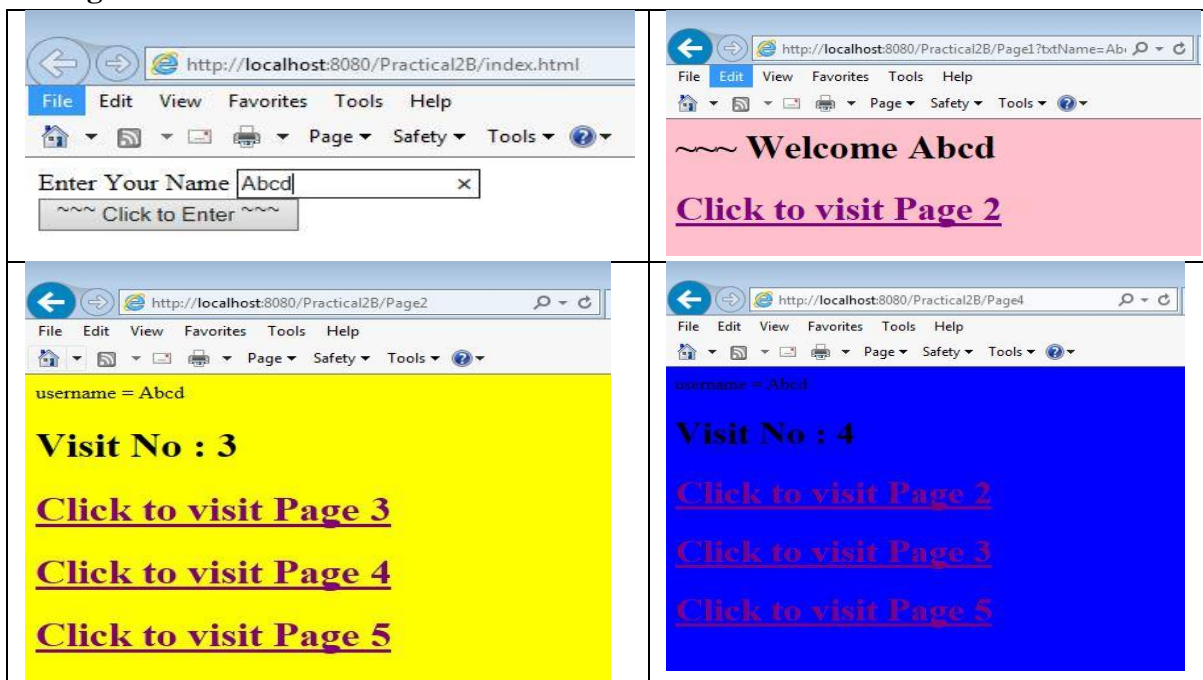
```
package mypack;
import java.io.*;
import javax.servlet.ServletException;
import javax.servlet.http.*;
public class Page2 extends HttpServlet {
```

```

public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head><title>Page2</title></head>");
    out.println("<body bgcolor=yellow >");
    Cookie [] ck = request.getCookies();
    for(int i=0;i<ck.length;i++){
    if(ck[i].getName().equals("visit")){
        int count = Integer.parseInt(ck[i].getValue())+1;
        out.println("<h1>Visit No : "+count+"</h1>");
        ck[i] = new Cookie("visit",count+"");
        response.addCookie(ck[i]);
    }
else {
    out.println(ck[i].getName()+ " = "+ck[i].getValue());
    out.println("<h1><a href=Page3 >Click to visit Page 3 </a></h1>");
    out.println("<h1><a href=Page4 >Click to visit Page 4 </a></h1>");
    out.println("<h1><a href=Page5 >Click to visit Page 5 </a></h1>");
    out.println("</body>");
    out.println("</html>");
    } }
}

```

**Repeat the code from Page2.java for Page3.java, Page4.java and Page5.java with relevant changes.**



**Important Note: - Run this program on one machine as server and student's machine as client using proxy setting to demonstrate tracking of individual visitor's activity by server using cookie**

**2c.** Create a servlet demonstrating the use of session creation and destruction. Also check whether the user has visited this page first time or has visited earlier also using sessions.

### index.html

```
<html>
<head><title>Session Demo</title></head>
<form action="Page1" method="get" >
    Enter User ID <input type="text" name="txtName"><br>
<input type="reset" ><input type="submit" >
</form>
</html>
```

### Page1.java

```
package mypack;
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;
import javax.servlet.http.HttpSession;
public class Page1 extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head><title>Servlet Page1</title></head>");

    HttpSession hs = request.getSession(true);
    if(hs.isNew()){
        out.println("<body bgcolor=yellow>");
        String name = request.getParameter("txtName");
        hs.setAttribute("uname", name);
        hs.setAttribute("visit", "1");
        out.println("<h1>Welcome First Time</h1>");
    }
    else{
        out.println("<h1>Welcome Again</h1>");
        int visit = Integer.parseInt((String)hs.getAttribute("visit"))+1;
        out.println("<h1>You Visited "+visit+"Times</h1>");
        hs.setAttribute("visit", ""+visit);
    }
    out.println("<h1>Your Session ID "+hs.getId()+"</h1>");
    out.println("<h1>You Logged in at "+new java.util.Date(hs.getCreationTime())+"</h1>");
    out.println("<h1><a href=Page2>Click for Page 2 </a></h1>");
    out.println("<h1><a href=Page3>Click for Page 3 </a></h1>");
```

```
        out.println("<h1><a href=Page4>Click for Page 4 </a></h1>");
        out.println("<h1><a href=LogoutServlet>Click to Terminate Session </a></h1>");
        out.println("</body>");
        out.println("</html>");
    }
}
```

### **Page2.java**

```
package mypack;
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;
import javax.servlet.http.HttpSession;
public class Page2 extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Servlet Page2</title></head>");

        HttpSession hs = request.getSession(false);
        out.println("<h1>Welcome Again on Page No. 2</h1>");
        int visit = Integer.parseInt((String)hs.getAttribute("visit"))+1;
        out.println("<h1>You Visited "+visit+"Times</h1>");
        hs.setAttribute("visit", ""+visit);

        out.println("<h1>Your Session ID "+hs.getId()+"</h1>");
        out.println("<h1>You Logged in at "+new java.util.Date(hs.getCreationTime())+"</h1>");
        out.println("<h1><a href=Page1>Click for Page 1 </a></h1>");
        out.println("<h1><a href=Page3>Click for Page 3 </a></h1>");
        out.println("<h1><a href=Page4>Click for Page 4 </a></h1>");
        out.println("<h1><a href=LogoutServlet>Click for Terminate Session </a></h1>");
        out.println("</body>");
        out.println("</html>");
    }
}
```

**Repeat the code from Page2.java in Page3.java and Page4.java with relevant changes.**

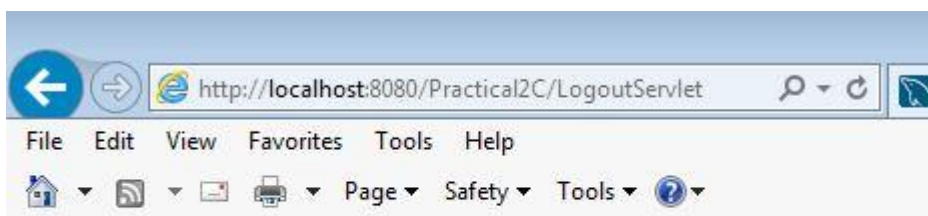
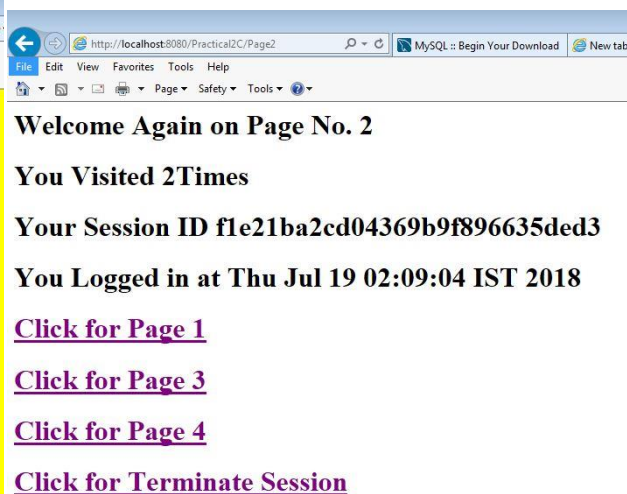
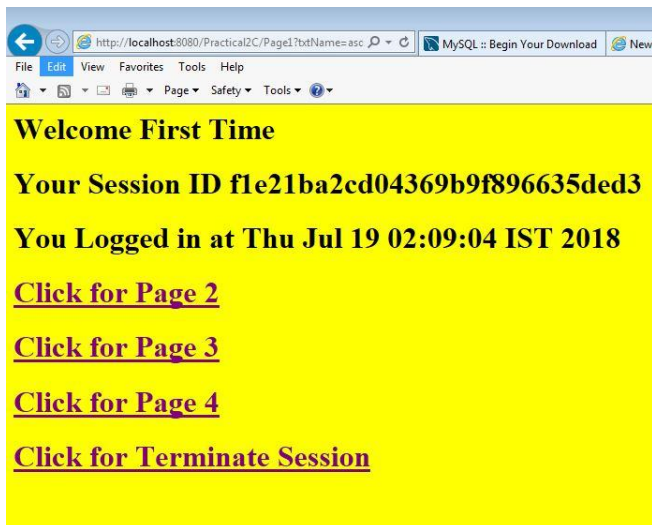
### **LogoutServlet.java**

```
package mypack;
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 LogoutServlet extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head><title>Servlet LogoutServlet</title></head>");
    out.println("<body>");
    javax.servlet.http.HttpSession hs = request.getSession();
    if(hs != null) hs.invalidate();
    out.println("<h1>You are Logged out now.....</h1>");
    out.println("</body>");
    out.println("</html>");
    }
}

```



**Important Note: - Run this program on one machine as server and student's machine as client using proxy setting to demonstrate tracking of individual visitor's activity by server.**

**3a.** Create a Servlet application to upload and download a file.

~~~~~ **index.html** ~~~~~

```
<html>
  <body>
    <form action="FileUploadServlet" method="post" enctype="multipart/form-data">
      Select File to Upload:<input type="file" name="file" id="file">
      Destination <input type="text" value="/tmp" name="destination">
      <br>
      <input type="submit" value="Upload file" name="upload" id="upload">
    </form>
  </body>
</html>
```

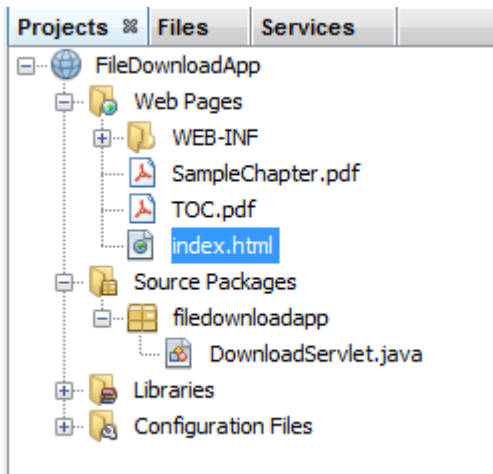
~~~~~ **FileUploadServlet.java** ~~~~~

```
package fileservletapp;

import java.io.*;
import javax.servlet.*;
import javax.servlet.annotation.MultipartConfig;
import javax.servlet.http.*;

@MultipartConfig
public class FileUploadServlet extends HttpServlet {
  public void doPost(HttpServletRequest req, HttpServletResponse res) throws ServletException,
  IOException
  {
    res.setContentType("text/html");
    PrintWriter out = res.getWriter();
    String path=req.getParameter("destination");
    Part filePart=req.getPart("file");
    String filename=filePart.getSubmittedFileName().toString();
    out.print("<br><br><hr> file name: "+filename);
    OutputStream os=null;
    InputStream is=null;
    try {
      os=new FileOutputStream(new File(path+File.separator+filename));
      is=filePart.getInputStream();
      int read=0;

      while ((read = is.read()) != -1) {
        os.write(read);
      }
      out.println("<br>file uploaded sucessfully...!!!");
    }
    catch(FileNotFoundException e){out.print(e);}
  } }
}
```



~~~~~ **index.html** ~~~~~

```
<html>
  <head>
    <title>File Download Page</title>
  </head>
  <body>
    <h1>File Download Application</h1>
    Click <a href="DownloadServlet?filename=SampleChapter.pdf">Sample Chapter</a>
    <br/><br/>
    Click <a href="DownloadServlet?filename=TOC.pdf">Table Of Contents</a>
  </body>
</html>
```

~~~~~ **DownloadServlet.java** ~~~~~

```
package filedownloadapp;

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

public class DownloadServlet extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
```



```
        throws ServletException, IOException {
    response.setContentType("APPLICATION/OCTET-STREAM");
    String filename = request.getParameter("filename");
    ServletContext context = getServletContext();
        InputStream is = context.getResourceAsStream("/") + filename);
    //ServletOutputStream out = response.getOutputStream(); // any of the two works
    PrintWriter out=response.getWriter();
    response.setHeader("Content-Disposition","attachment; filename=\"\" + filename + "\""); //
if comment this statement then it wl ask you about the editor with which you want to open the file

    int i;

        while ((i=is.read()) != -1) {
            out.write(i);
        }
        is.close();
        out.close();
    }

}
```

**3b. Develop Simple Servlet Question Answer Application using Database.**

```

create database qadb;
use qadb;
create table quiz (qno varchar(5) PRIMARY KEY,question varchar(100), op1 varchar(50), op2
varchar(50), op3 varchar(50), op4 varchar(50), ans varchar(50))
insert into quiz values('001','What is the capital of India??','New
Delhi','Kolkata','Chennai','Mumbai','New Delhi');
insert into quiz values('002','Who was the First President of India??','Dr. Rajendra Prasad','Dr. S.
Radhakrishnan','Ram Nath Kovind','V. V. Giri','Dr. Rajendra Prasad');
insert into quiz values('003','What is ORM','Object Ratio Mean','Object Rotation Measure','Object
Relation Mapping','Oracle Request Management','Object Relation Mapping');
insert into quiz values('004','Unit of Energy is ___','Dozon','Kilo Meter ','Joul','Hertz','Joul')
insert into quiz values('005',' --- is the smallest memory unit.','bit','byte','Kilo Byte','Giga Byte','bit')

```

**index.html**

```

<html><head><title>Quiz Application</title></head>
<body>
<h1>Welcome to Quiz Servlet </h1>
<h1><a href="QuizServlet" >CLICK TO START QUIZ</a></h1>
</body>
</html>

```

**QuizServlet.java**

```

package mypack;

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

public class QuizServlet extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
response.setContentType("text/html;charset=UTF-8");
PrintWriter out = response.getWriter();
out.println("<form action=ShowResult >");
try {
Class.forName("com.mysql.jdbc.Driver");
Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/qadb","root","root");
Statement stmt = con.createStatement();
ResultSet res = stmt.executeQuery("select * from quiz");
out.println("<table border=1 >");
int qno=0;
while(res.next()){
qno++;

```

```

out.println("<tr><td>" + res.getString(1) + "</td>");
out.println("<td>" + res.getString(2) + "</td></tr>");
out.println("<tr><td><input type=radio name="+qno+"
value="+res.getString(3)+"></td><td>" + res.getString(3) + "</td></tr>");
out.println("<tr><td><input type=radio name="+qno+"
value="+res.getString(4)+"></td><td>" + res.getString(4) + "</td></tr>");
out.println("<tr><td><input type=radio name="+qno+"
value="+res.getString(5)+"></td><td>" + res.getString(5) + "</td></tr>");
out.println("<tr><td><input type=radio name="+qno+"
value="+res.getString(6)+"></td><td>" + res.getString(6) + "</td></tr>");
}
    } catch (Exception e) { out.println(e); }
out.println("</table>");
out.println("<input type=reset >");
    out.println("<input type=submit value=SUBMIT >");
    out.println("</form>");    } }

```

```

----- ShowResult.java -----
package mypack;
import java.io.*;
import java.sql.*;
import javax.servlet.*;
import javax.servlet.http.*;
public class ShowResult extends HttpServlet {
public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    try {
        Class.forName("com.mysql.jdbc.Driver");
        Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/qadb","root","root");
        Statement stmt = con.createStatement();
        ResultSet res = stmt.executeQuery("select ans from quiz");
        int count = 0, qno = 0;
        while(res.next()){
            if(res.getString(1).equals(request.getParameter(""+(++qno))))
            { count++;
              out.println("<h1>Correct </h1>");
            }
            else {
                out.println("<h1>Incorrect </h1>");
            }
        }
    }
    out.println("<h1>Your Score is "+count+" </h1>");
    } catch (Exception e) { out.println(e); } }

```

select \* from quiz

Max. rows: 100

Fetched Rows: 5

Matching Rows:

| # |                         | op1                 | op2                     | op3                     | op4                       | ans                     |
|---|-------------------------|---------------------|-------------------------|-------------------------|---------------------------|-------------------------|
| 1 | tal of India??          | New Delhi           | Kolkata                 | Chennai                 | Mumbai                    | New Delhi               |
| 2 | st President of India?? | Dr. Rajendra Prasad | Dr. S. Radhakrishnan    | Ram Nath Kovind         | V. V. Giri                | Dr. Rajendra Prasad     |
| 3 |                         | Object Ratio Mean   | Object Rotation Measure | Object Relation Mapping | Oracle Request Management | Object Relation Mapping |
| 4 | ___                     | Dozon               | Kilo Meter              | Joul                    | Hertz                     | Joul                    |
| 5 | memory unit.            | bit                 | byte                    | Kilo Byte               | Giga Byte                 | bit                     |
|   |                         |                     |                         |                         |                           |                         |

## QuizServlet

Firefox | http://localhost:8080/Practical3B/QuizServlet

localhost:8080/Practical3B/QuizServlet

001 What is the capital of India??

☒ New Delhi

☐ Kolkata

☐ Chennai

☐ Mumbai

002 Who was the First President of India??

☒ Dr. Rajendra Prasad

☐ Dr. S. Radhakrishnan

☐ Ram Nath Kovind

☐ V. V. Giri

003 What is ORM

☐ Object Ratio Mean

☐ Object Rotation Measure

☒ Object Relation Mapping

☐ Oracle Request Management

004 Unit of Energy is \_\_\_\_

☐ Dozon

☐ Kilo Meter

☒ Joul

☐ Hertz

005 What is the smallest memory unit.

☒ bit

☐ byte

☐ Kilo Byte

☐ Giga Byte

Reset SUBMIT

## ShowResult

Firefox | http://localhost:8080/Practical3B/ShowResult

localhost:8080/Practical3B/ShowResult

**Incorrect****Incorrect****Incorrect****Correct****Correct****Your Score is 2**

**3c. Create simple Servlet application to demonstrate Non-Blocking Read Operation.**

```

<html>
<head>
<title>Non Blocking IO</title>
<meta charset="UTF-8">
<meta http-equiv="Refresh" content="0; URL=NonBlockingServlet">
</head>
<body>
</body>
</html>

```

```

----- NonBlockingServlet.java -----
package nonblkapp;

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

public class NonBlockingServlet extends HttpServlet {
    protected void service(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {

            out.println("<h1>FileReader</h1>");
            String filename="/WEB-INF/booklist.txt";
            ServletContext c=getServletContext();
            InputStream in=c.getResourceAsStream(filename);
            String
path="http://" + request.getServerName() + ":" + request.getServerPort() + request.getContextPath() + "/ReadingNonBlockingServlet";
            URL url=new URL(path);
            HttpURLConnection conn=(HttpURLConnection)url.openConnection();
            conn.setChunkedStreamingMode(2);
            conn.setDoOutput(true);
            conn.connect();
            if(in!=null)
            {
                InputStreamReader inr=new InputStreamReader(in);
                BufferedReader br = new BufferedReader(inr);
                String text="";
                System.out.println("Reading started....");
                BufferedWriter bw=new BufferedWriter(new
OutputStreamWriter(conn.getOutputStream()));
                while((text=br.readLine())!=null){
                    out.print(text+"<br>");

```

```
        try{
            Thread.sleep(1000);
            out.flush();
        }
        catch(InterruptedException ex){}
    }out.print("reading completed....");
        bw.flush();
        bw.close();

    }
}
}
```

----- ReadingListener.java -----

```
package nonblkapp;
import java.io.IOException;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.servlet.AsyncContext;
import javax.servlet.ReadListener;
import javax.servlet.ServletInputStream;

public class ReadingListener implements ReadListener
{
    private ServletInputStream input = null;
    private AsyncContext ac = null;

    ReadingListener(ServletInputStream in, AsyncContext c) {
        input = in;
        ac = c;
    }
    @Override
    public void onDataAvailable() throws IOException {
    }
    public void onAllDataRead() throws IOException {
        ac.complete();
    }
    public void onError(final Throwable t) {
        ac.complete();
        t.printStackTrace();
    }
}
```

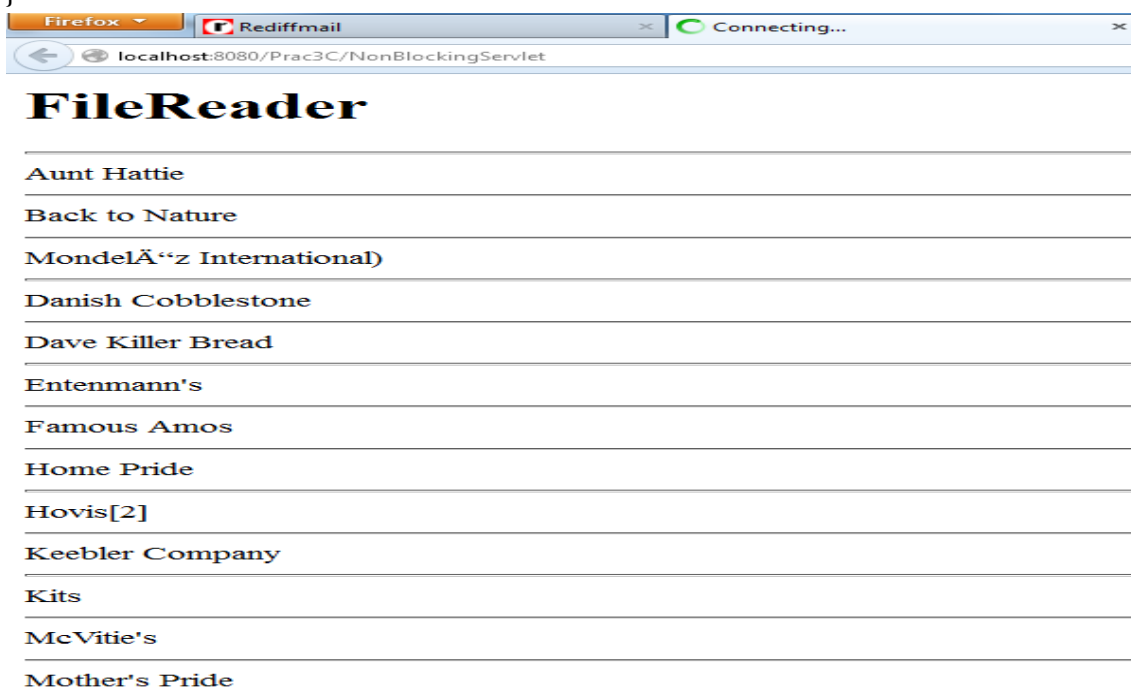
----- ReadingNonBlockingServlet.java -----

```

package nonblkapp;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.AsyncContext;
import javax.servlet.ServletException;
import javax.servlet.ServletInputStream;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
/**
 *
 * @author Beena
 */
@WebServlet (name = "ReadingNonBlockingServlet", urlPatterns =
{"/ReadingNonBlockingServlet"}, asyncSupported = true )
public class ReadingNonBlockingServlet extends HttpServlet {
@Override
protected void service(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
response.setContentType("text/html");
AsyncContext ac = request.startAsync();
ServletInputStream in=request.getInputStream();
in.setReadListener(new ReadingListener(in,ac));
}
}

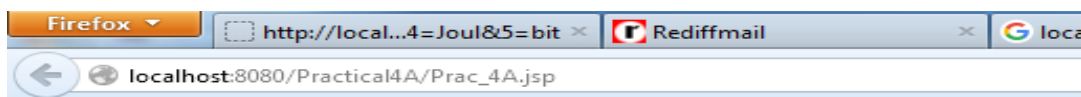
```





**4a.** Develop a simple JSP application to display values obtained from the use of intrinsic objects of various types.

```
<% @page contentType="text/html" pageEncoding="UTF-8"%>
<html><head><title>JSP Page</title></head>
<body>
<h1>Use of Intrinsic Objects in JSP</h1>
<h1>Request Object </h1>
    Query String <%=request.getQueryString() %><br>
    Context Path <%=request.getContextPath() %><br>
    Remote Host <%=request.getRemoteHost() %><br>
<h1>Response Object </h1>
    Character Encoding Type <%=response.getCharacterEncoding() %><br>
    Content Type <%=response.getContentType() %><br>
    Locale <%=response.getLocale() %><br>
<h1>Session Object </h1>
    ID <%=session.getId() %><br>
    Creation Time <%=new java.util.Date(session.getCreationTime()) %><br>
    Last Access Time<%=new java.util.Date(session.getLastAccessedTime()) %><br>
</body>
</html>
```



## Use of Intrinsic Objects in JSP

### Request Object

Query String null  
Context Path /Practical4A  
Remote Host 0:0:0:0:0:0:1

### Response Object

Character Encoding Type UTF-8  
Content Type text/html; charset=UTF-8  
Locale en\_US

### Session Object

ID 39a6dd44e151027609e21c8b80c6  
Creation Time Thu Jul 19 23:03:19 IST 2018  
Last Access Time Thu Jul 19 23:09:20 IST 2018

**4b.** Develop a simple JSP application to pass values from one page to another with validations.  
(Name-txt, age-txt, hobbies-checkbox, email-txt, gender-radio button).

### index.html

```
<html><head><title>User Information Paage</title>
</head>
<body>
<form action="Validate.jsp">
    Enter Your Name<input type="text" name="name" ><br>
    Enter Your Age<input type="text" name="age" ><br>
    Select Hobbies
    <input type="checkbox" name="hob" value="Singing">Singing
    <input type="checkbox" name="hob" value="Reading">Reading Books
    <input type="checkbox" name="hob" value="Football">Playing Football<br>
    Enter E-mail<input type="text" name="email" ><br>
    Select Gender
    <input type="radio" name="gender" value="male">Male
    <input type="radio" name="gender" value="female">Female
    <input type="radio" name="gender" value="other">Other<br>
    <input type="hidden" name="error" value="">
    <input type="submit" value="Submit Form">
</form>
</body>
</html>
```

```
----- Validate.jsp-----
<% @page contentType="text/html" pageEncoding="UTF-8" import="mypack.*" %>
<html><head><title>JSP Page</title></head>
<body>
<h1>Validation Page</h1>

<jsp:useBean id="obj" scope="request"
    class="mypack.CheckerBean" >
<jsp:setProperty name="obj" property="*/>
</jsp:useBean>

<% if (obj.validate())
{ %>
<jsp:forward page="successful.jsp"/>
<% }
else { %>
<jsp:include page="index.html"/>
<% }%>
<%=obj.getError() %>
</body></html>
```

-----CheckerBean.java-----

```
package mypack;
```

```
public class CheckerBean {
private String name, age, hob, email, gender, error;
public CheckerBean(){error="";}
public void setName(String n){name=n;}
public void setAge(String a){age=a;}
public void setHob(String h){hob=h;}
public void setEmail(String e){email=e;}
public void setGender(String g){gender=g;}
public void setError(String e){error=e;}
public String getName(){return name;}
public String getAge(){return age;}
public String getHob(){return hob;}
public String getEmail(){return email;}
public String getGender(){return gender;}
public String getError(){return error;}
public boolean validate(){
boolean res=true;
if(name.trim().equals("")) {error+="<br>Enter First Name";res=false;}
if(age.length() > 2 )
{error+="<br>Age Invalid";res=false;}

return res;
}
}
```

## Validation Page

Enter First Name  
Age Invalid

**4c.** Create a registration and login JSP application to register and authenticate the user based on username and password using JDBC.

-----Register.html-----

```
<html><head><title>New User Registration Page</title></head>
<body>
<form action="Register.jsp" >
<h1> New User Registration Page</h1>
    Enter User Name <input type="text" name="txtName" ><br>
    Enter Password <input type="password" name="txtPass1" ><br>
    Re-Enter Password<input type="password" name="txtPass2" ><br>
    Enter Email<input type="text" name="txtEmail" ><br>
    Enter Country Name <input type="text" name="txtCon" ><br>
<input type="reset" ><input type="submit" value="REGISTER" >
</form>
</body>
</html>
```

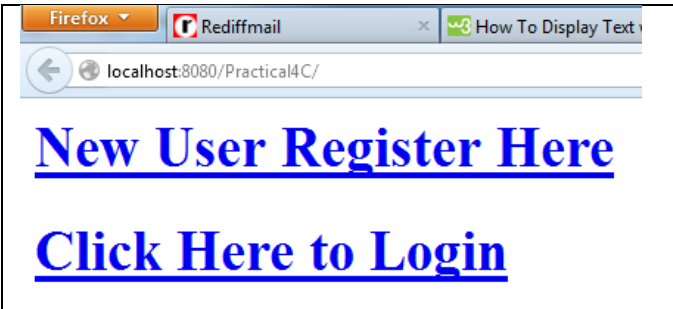

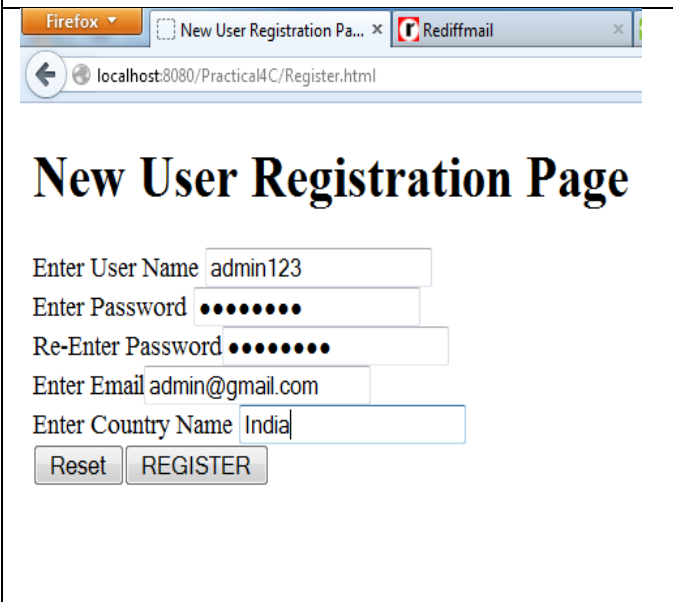

-----Register.jsp-----

```
<% @page contentType="text/html" import="java.sql.*"%>
<html><body>
<h1>Registration JSP Page</h1>
<%
    String uname=request.getParameter("txtName");
    String pass1 = request.getParameter("txtPass1");
    String pass2 = request.getParameter("txtPass2");
    String email = request.getParameter("txtEmail");
    String ctry = request.getParameter("txtCon");
    if(pass1.equals(pass2)){
        try{
            Class.forName("com.mysql.jdbc.Driver");
            Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/logindb");
            PreparedStatement stmt = con.prepareStatement("insert into user values (?, ?, ?, ?)");
            stmt.setString(1, uname);  stmt.setString(2, pass1);
            stmt.setString(3, email);  stmt.setString(4, ctry);
            int row = stmt.executeUpdate();
            if(row==1) { out.println("Registration Successful"); }
            else {
                out.println("Registration FFFFFAAAIILLLL !!!");
                %><jsp:include page="Register.html" ></jsp:include>
            }
        } catch(Exception e){out.println(e);}
    }
    else
    {
        out.println("<h1>Password Mismatch</h1>");
    }
}
```

```

%>
<jsp:include page="Register.html" ></jsp:include>
<% }
%>
</body>
</html>

```

|  |   |
|--|---|
|   |   |
|  |  |

| SELECT * FROM logindb."us..."    |          |          |                 |         |
|----------------------------------|----------|----------|-----------------|---------|
| Max. rows: 100   Fetched Rows: 3 |          |          |                 |         |
| #                                | username | password | email           | country |
| 1                                | admin    | admin    | admin@admin.com | India   |
| 2                                | admin123 | admin123 | admin@conio.h   | India   |

----- Login.html -----

```

<html>
<body>
<h1>Login Page</h1>
<form action="Login.jsp" >
    Enter User Name <input type="text" name="txtName" ><br>
    Enter Password <input type="password" name="txtPass" ><br>
<input type="reset" ><input type="submit" value="~~~LOGIN~~" >
</form>
</body>
</html>

```

----- Login.jsp -----

```
<% @page contentType="text/html" import="java.sql.*"%>
<html><body>
<h1>Registration JSP Page</h1>
<%
    String uname=request.getParameter("txtName");
    String pass = request.getParameter("txtPass");
    try{
    Class.forName("com.mysql.jdbc.Driver");
    Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/logindb");
    PreparedStatement stmt = con.prepareStatement("select password from user where username=?");
    stmt.setString(1, uname);
    ResultSet rs = stmt.executeQuery();
    if(rs.next()){
        if(pass.equals(rs.getString(1)))
        {
            out.println("<h1>~~~ LOGIN SUCCESSFULL ~~~ </h1>");
        }
    }
    else{
        out.println("<h1>User Name not exist !!!!!</h1>");
    }
    %>
<jsp:include page="Register.html" ></jsp:include>
<%
    }
    }catch(Exception e){out.println(e);}
    %>
</body></html>
```

**5a.** Create an html page with fields, eno, name, age, desg, salary. Now on submit this data to a JSP page which will update the employee table of database with matching eno.

```
create table emp(empid varchar(10) PRIMARY KEY, ename varchar(50), salary varchar(50),age
varchar(50) )
```

```
insert into emp values('1','aaa','221234','11')
```

```
insert into emp values('2','bbb','334567','22')
```

```
insert into emp values('3','ccc','44454','33')
```

```
insert into emp values('4','ddd','55123','44')
```

```
---- index.html -----
```

```
<html>
```

```
<body>
```

```
<form action="UpdateEmp.jsp" >
```

```
    Enter Employee Number<input type="text" name="txtEno" ><br>
```

```
    Enter Name<input type="text" name="txtName" ><br>
```

```
    Enter age<input type="text" name="txtAge" ><br>
```

```
    Enter Salary<input type="text" name="txtSal" ><br>
```

```
<input type="reset" ><input type="submit">
```

```
</form>
```

```
</body>
```

```
</html>
```

```
----- UpdateEmp.java -----
```

```
<% @page contentType="text/html" import="java.sql.*" %>
```

```
<html><body>
```

```
<h1>Employee Record Update</h1>
```

```
<%
```

```
    String eno=request.getParameter("txtEno");
```

```
    String name=request.getParameter("txtName");
```

```
    String age = request.getParameter("txtAge");
```

```
    String sal = request.getParameter("txtSal");
```

```
        try{
```

```
Class.forName("com.mysql.jdbc.Driver");
```

```
Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/empdb");
```

```
PreparedStatement stmt = con.prepareStatement("select * from emp where empid=?");
```

```
stmt.setString(1, eno);
```

```
ResultSet rs = stmt.executeQuery();
```

```
if(rs.next()){
```

```
    out.println("<h1>~~~ Employee "+name+" Exist ~~~ </h1>");
```

```
    PreparedStatement pst1= con.prepareStatement("update emp set salary=? where empid=?");
```

```
    PreparedStatement pst2= con.prepareStatement("update emp set age=? where empid=?");
```

```
    pst1.setString(1, sal); pst1.setString(2, eno);
```

```
    pst2.setString(1, age); pst2.setString(2, eno);
```

```
    pst1.executeUpdate();    pst2.executeUpdate();
```

```
}
```



```

else{
out.println("<h1>Employee Record not exist !!!!!</h1>");

}
} catch(Exception e){out.println(e);}
%></body></html>

```

| SELECT * FROM emp LIMIT 1... %   |       |       |        |     |
|----------------------------------|-------|-------|--------|-----|
| Max. rows: 100   Fetched Rows: 5 |       |       |        |     |
| #                                | empid | ename | salary | age |
| 1                                | 1     | aaaa  | 12345  | 11  |
| 2                                | 2     | bbbb  | 2222   | 22  |
| 3                                | 3     | cccc  | 12121  | 33  |
| 4                                | 4     | dddd  | 123123 | 44  |
| 5                                | 5     | eeee  | 12123  | 55  |

| SELECT * FROM emp LIMIT 1... %   |       |       |        |     |
|----------------------------------|-------|-------|--------|-----|
| Max. rows: 100   Fetched Rows: 5 |       |       |        |     |
| #                                | empid | ename | salary | age |
| 1                                | 1     | aaaa  | 54321  | 99  |
| 2                                | 2     | bbbb  | 2222   | 22  |
| 3                                | 3     | cccc  | 12121  | 33  |
| 4                                | 4     | dddd  | 123123 | 44  |

**5b.** Create a JSP page to demonstrate the use of Expression language.

<< any example to demonstrate the use of EL like calculator or any formulas etc.... >>

**5c. Create a JSP application to demonstrate the use of JSTL.**

**Basic insert, update and delete example using core and sql tag libraries in JSTL.**

```
CREATEDATABASEIF NOTEXISTS sampleDB;
CREATETABLE`product` (
  `id` int(10) unsigned NOTNULLauto_increment,
  `pname` varchar(45) NOTNULL,
  `quantity` int(10) unsigned NOTNULL,
  PRIMARYKEY (`id`)
);

INSERTINTO`product` (`id`,`pname`,`quantity`) VALUES
(1, 'Mouse', 50),
(2, 'Keyboard', 5),
(3, 'Monitor', 34);
```

### 1. index.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
  <head>
    <metahttp-equiv="Content-Type"content="text/html; charset=UTF-8">
    <title>JSP Page</title>
  </head>
  <body>
    <h1>Choose Option</h1>
    <a href="insert.jsp">Insert Record</a><p></p>
    <a href="display.jsp">Display Record</a>
  </body>
</html>
```

### 2. insert.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<!DOCTYPE html>
<html>
  <head>
    <metahttp-equiv="Content-Type"content="text/html; charset=UTF-8">
    <title>JSP Page</title>
  </head>
  <body>
    <formaction="insertdb.jsp"method="post">
      <tableborder="0"cellspacing="2"cellpadding="5">
        <thead>
          <tr>
            <th colspan="2">Purchase Product</th>
          </tr>
        </thead>
        <tbody>
          <tr>
            <td><label>Product Name</label></td>
            <td><inputtype="text"name="pname"/></td>
          </tr>
          <tr>
            <td><label>Quantity</label></td>
            <td><inputtype="text"name="qty"/></td>
          </tr>
          <tr>
            <td><inputtype="submit"value="Save"/></td>
            <td><inputtype="reset"value="reset"/></td>
          </tr>
        </tbody>
      </table>
    </form>
  </body>
</html>
```

```

        </tbody>
    </table>
</form>
<fontcolor="red"><c:iftest="${not empty param.errMsg}">
    <c:outvalue="${param.errMsg}"/>
    <a href="index.jsp">Go Back</a>
</c:if></font>
<fontcolor="green"><c:iftest="${not empty param.susMsg}">
    <c:outvalue="${param.susMsg}"/>
    <a href="index.jsp">Go Back</a>
</c:if></font>

</body>
</html>

```

### 3. insertdb.jsp

```

<%@ page import="java.io.*,java.util.*,java.sql.*"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/sql" prefix="sql"%>

<html>
    <head>
        <title>JINSERT Operation</title>
    </head>
    <body>
        <c:iftest="${ empty param.pname or empty param.qty}">
            <c:redirecturl="insert.jsp">
                <c:paramname="errMsg" value="Please Enter Product and Quantity"/>
            </c:redirect>

        </c:if>
        <sql:setDataSource var="dbsource" driver="com.mysql.jdbc.Driver"
            url="jdbc:mysql://localhost/sampleDB"
            user="root" password="pass"/>

        <sql:update dataSource="${dbsource}" var="result">
            INSERT INTO product(pname, quantity) VALUES (?,?);
            <sql:param value="${param.pname}"/>
            <sql:param value="${param.qty}"/>
        </sql:update>
        <c:iftest="${result}>=1}">
            <fontsize="5" color='green'> Congratulations ! Data inserted
            successfully.</font>

            <c:redirecturl="insert.jsp">
                <c:paramname="susMsg" value="Congratulations ! Data inserted
                successfully." />
            </c:redirect>
        </c:if>

    </body>
</html>

```

### 4. display.jsp

```

<%@ page import="java.io.*,java.util.*,java.sql.*"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/sql" prefix="sql"%>

<html>
    <head>

```

```

<title>SELECT Operation</title>
<script>
    function confirmGo(m,u) {
        if ( confirm(m) ) {
            window.location = u;
        }
    }
</script>
</head>
<body>

    <sql:setDataSourcevar="dbsource"driver="com.mysql.jdbc.Driver"
        url="jdbc:mysql://localhost/sampleDB"
        user="root" password="pass"/>

    <sql:querydataSource="${dbsource}"var="result">
        SELECT * from product;
    </sql:query>
<center>
    <form>
        <tableborder="1"width="40%">
            <caption>Product List</caption>
            <tr>
                <th>Product ID</th>
                <th>Product Name</th>
                <th>Quantity</th>
                <thcolspan="2">Action</th>
            </tr>
            <c:forEachvar="row"items="${result.rows}">
                <tr>
                    <td><c:outvalue="${row.id}"/></td>
                    <td><c:outvalue="${row.pname}"/></td>
                    <td><c:outvalue="${row.quantity}"/></td>
                    <td><ahref="update.jsp?id=<c:out
value="${row.id}"/>">Update</a></td>
                    <td><ahref="javascript:confirmGo('Sure to delete this
record?','deletedb.jsp?id=<c:out value="${row.id}"/>')">Delete</a></td>

                </tr>
            </c:forEach>
        </table>
    </form>
    <ahref="index.jsp">Go Home</a>
</center>
</body>
</html>

```

## 5. update.jsp

```

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@ page import="java.io.*,java.util.*,java.sql.*"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/sql" prefix="sql"%>
<!DOCTYPE html>
<html>
    <head>
        <metahttp-equiv="Content-Type"content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>

        <sql:setDataSourcevar="dbsource"driver="com.mysql.jdbc.Driver"
            url="jdbc:mysql://localhost/sampleDB"

```

```

        user="root" password="pass"/>

<sql:querydataSource="${dbsource}"var="result">
    SELECT * from product where id=?;
    <sql:paramvalue="${param.id}"/>
</sql:query>
<formaction="updatedb.jsp"method="post">
    <tableborder="0"width="40%">
        <caption>Update Product</caption>
        <tr>
            <th>Product Name</th>
            <th>Quantity</th>
        </tr>
        <c:forEachvar="row"items="${result.rows}">
            <tr>
                <td><inputtype="hidden"value="${param.id}"name="id"/>
                    <inputtype="text"value="${row.pname}"name="pname"/></td>
                <td><inputtype="text"value="${row.quantity}"name="qty"/></td>
                <td><inputtype="submit"value="Update"/></td>
            </tr>
        </c:forEach>
    </table>
    <a href="index.jsp">Go Home</a>
</form>
</body>
</html>

```

## 6. updatedb.jsp

```

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@ page import="java.io.*,java.util.*,java.sql.*"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/sql" prefix="sql"%>
<!DOCTYPE html>
<html>
    <head>
        <metahttp-equiv="Content-Type"content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <sql:setDataSourcevar="dbsource"driver="com.mysql.jdbc.Driver"
            url="jdbc:mysql://localhost/sampleDB"
            user="root" password="pass"/>
        <sql:updatedataSource="${dbsource}"var="count">
            UPDATE product SET pname = ?, quantity=?
            WHERE id='${param.id}'
            <sql:paramvalue="${param.pname}"/>
            <sql:paramvalue="${param.qty}"/>
        </sql:update>
        <c:iftest="${count}>1">
            <fontsize="5"color='green'> Congratulations ! Data updated
            successfully.</font>
            <a href="index.jsp">Go Home</a>
        </c:if>
    </body>
</html>

```

## 7. deletedb.jsp

```

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@ page import="java.io.*,java.util.*,java.sql.*"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/sql" prefix="sql"%>
<!DOCTYPE html>
<html>

```

```
<head>
  <metahttp-equiv="Content-Type"content="text/html; charset=UTF-8">
  <title>JSP Page</title>
</head>
<body>
  <sql:setDataSourcevar="dbsource"driver="com.mysql.jdbc.Driver"
                        url="jdbc:mysql://localhost/sampleDB"
                        user="root" password="pass"/>
  <sql:updatedataSource="${dbsource}"var="count">
    DELETE FROM product
    WHERE id='${param.id}'
  </sql:update>
  <c:iftest="${count}=1">
    <fontsize="5"color='green'> Congratulations ! Data deleted
    successfully.</font>
    <a href="index.jsp">Go Home</a>
  </c:if>
</body>
</html>
```

**6a.** Create a Currency Converter application using EJB.

----- **index.html** -----

```
<html><head><title>Currency Converter</title></head>
<body>
<form action="CCServlet" >
    Enter Amount <input type="text" name="amt"><br>
    Select Conversion Type
<input type="radio" name="type" value="r2d" checked>Rupees to Dollar
<input type="radio" name="type" value="d2r" >Dollor to Rupees<br>
<input type="reset" ><input type="submit" value="CONVERT" >
</form>
</body>
</html>
```

----- **CCServlet.java** -----

```
package mypack;
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;
import javax.ejb.EJB;
import mybeans.CCBean;
public class CCServlet extends HttpServlet {
    @EJB CCBean obj;
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        double amt = Double.parseDouble(request.getParameter("amt"));
        if(request.getParameter("type").equals("r2d"))
        {
            out.println("<h1>"+amt+ " Rupees = "+obj.r2Dollor(amt)+" Dollors</h1>");
        }
        if(request.getParameter("type").equals("d2r"))
        {
            out.println("<h1>"+amt+ " Dollors = "+obj.d2Rupees(amt)+" Rupees</h1>");
        }
    }
}
```

----- **CCBean** -----

Create a stateless session bean

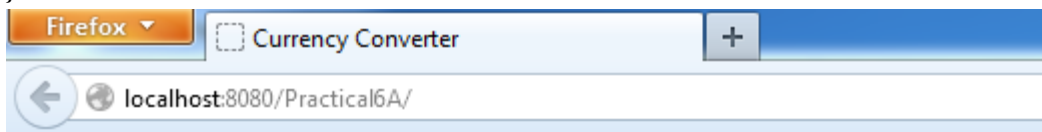
```
package mybeans;

import javax.ejb.Stateless;

@Stateless
```

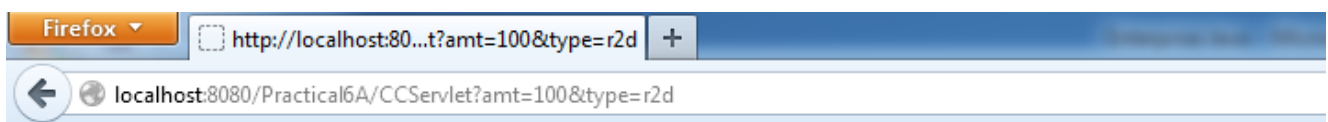


```
public class CCBean {  
    public CCBean(){}  
    public double r2Dollor(double r){ return r/65.65; }  
    public double d2Rupees(double d){ return d*65.65; }  
}
```



Enter Amount

Select Conversion Type ☒ Rupees to Dollar ☐ Dollor to Rupees



**100.0 Rupees = 1.523229246001523 Dollors**

**6b. Develop a Simple Room Reservation System Application Using EJB.**

Create table roombook(RoomId varchar(4) PRIMARY KEY, RoomType varchar(20), charges number(5,2), cust varchar(20), mob varchar(20) , status varchar(10))

insert into roombook values('1001','Delux',5000.00,"","Not Booked')

insert into roombook values('1002','Super Delux',7000.00,"","Not Booked')

insert into roombook values('1003','Suit',9500.00,"","Not Booked')

insert into roombook values('2001','Delux',5000.00,"","Not Booked')

insert into roombook values('2002','Super Delux',7000.00,"","Not Booked')

insert into roombook values('2003','Suit',9500.00,"","Not Booked')

-----RoomBook.html -----

```
<form action="RBServlet" >
```

```
    Select a room Type
```

```
<input type="radio" name="txtType" value="Delux">Delux
```

```
<input type="radio" name="txtType" value="Super Delux">Super Delux
```

```
<input type="radio" name="txtType" value="Suit">Suit<br>
```

```
    Enter Your Name<input type="text" name="txtCust" ><br>
```

```
    Enter Mobile No.<input type="text" name="txtMob" ><br>
```

```
<input type="reset" ><input type="submit" value="Book Room">
```

```
</form>
```

-----RBServlet-----

```
package mypack;
```

```
import java.io.*;
```

```
import javax.servlet.*;
```

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

```
import javax.ejb.EJB;
```

```
import mybeans.RRBean;
```

```
public class RBServlet extends HttpServlet {
```

```
    @EJB RRBean obj;
```

```
    public void doGet(HttpServletRequest request, HttpServletResponse response)
```

```
    throws ServletException, IOException{
```

```
        PrintWriter out=response.getWriter();
```

```
        String rt=request.getParameter("txtType");
```

```
        String cn=request.getParameter("txtCust");
```

```
        String cm=request.getParameter("txtMob");
```

```
        String msg = obj.roomBook(rt, cn, cm);
```

```
        out.println(msg);
```

```
    }}
```

-----RRBean.java -----

```
package mybeans;
```

```
import javax.ejb.Stateless;
```

```
import java.sql.*;
```

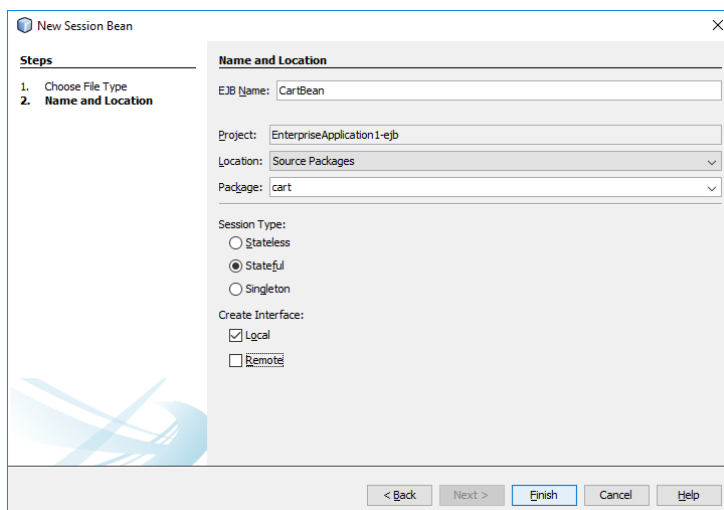
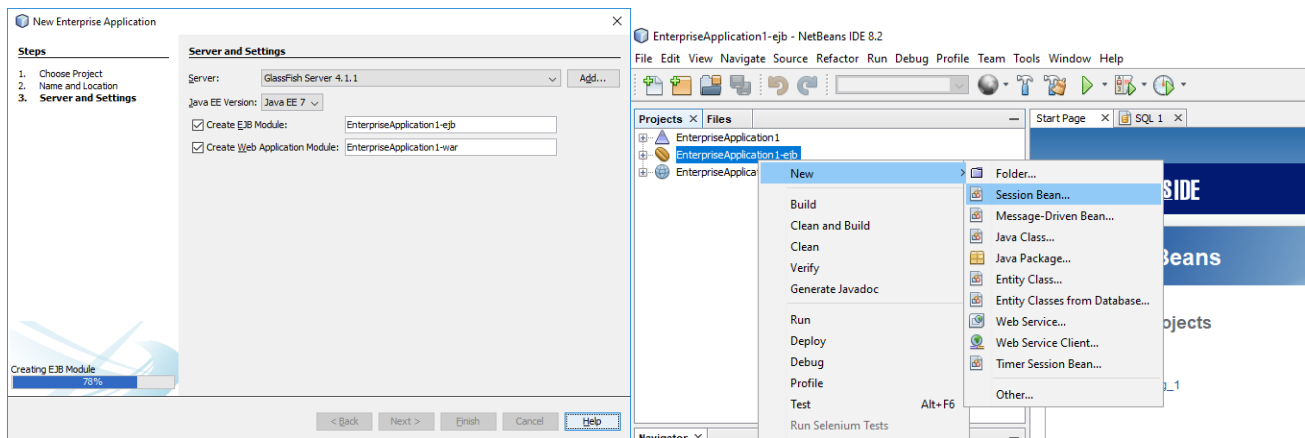
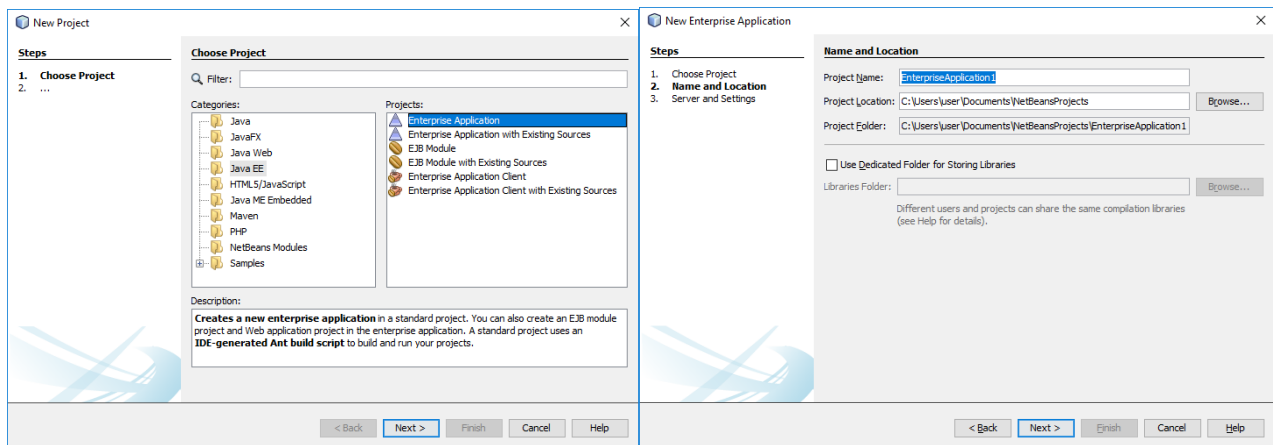
```
@Stateless
```

```
public class RRBean {
```

```

public RRBean(){ }
public String roomBook(String rt, String cn, String cm){
String msg="";
try{
Class.forName("com.mysql.jdbc.Driver");
Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/rrdb","root","root");
String query="select * from roombook where RoomType=? and status='Not Booked'";
PreparedStatement pst = con.prepareStatement(query);
pst.setString(1,rt);
ResultSet rs= pst.executeQuery();
if(rs.next()){
String rno=rs.getString(1);
PreparedStatement stm1 = con.prepareStatement("update roombook set cust=? where RoomId=? ");
PreparedStatement stm2 = con.prepareStatement("update roombook set mobile=? where RoomId=? ");
PreparedStatement stm3 = con.prepareStatement("update roombook set status=? where RoomId=? ");
stm1.setString(1,cn);    stm1.setString(2,rno);
stm2.setString(1,cm);    stm2.setString(2,rno);
stm3.setString(1, "Booked"); stm3.setString(2,rno);
stm1.executeUpdate();
stm2.executeUpdate();
stm3.executeUpdate();
msg = "Room "+rno+ " Booked <br> Charges = "+rs.getString(3);
}
else
{
msg = "Room "+rt+ " currently Not available";
}
}catch(Exception e){msg=""+e;}
return msg;}}

```

**6c. Develop simple shopping cart application using EJB [Stateful Session Bean].**

**CartBeanLocal.java**

```
package cart;

import java.util.List;
import javax.ejb.Local;

@Local
public interface CartBeanLocal {
    public void initialize(String person) throws Exception;
    public void initialize(String person, String id)
        throws Exception;
    public void addBook(String title);
    public void removeBook(String title) throws Exception;
    public List<String> getContents();
    public void remove();
}
```

**CartBean.java**

~~~~~

```
package cart;

import java.util.ArrayList;
import java.util.List;
import javax.ejb.Remove;
import javax.ejb.Stateful;

@Stateful
public class CartBean implements CartBeanLocal {
    String customerName;
    String customerId;
    List<String> contents;

    public void initialize(String person, String id)
        throws Exception {
        if (person == null) {
            throw new Exception("Null person not allowed.");
        } else {

            customerName = person;
        }

        if ( person=="ABC" && id=="123") {
```

```

        customerId = id;
    } else {
        throw new Exception("Invalid id: " + id);
    }
}

```

```

contents = new ArrayList<String>();
}

```

```

public void addBook(String title) {
    contents.add(title);
}

```

```

public void removeBook(String title) throws Exception {
    boolean result = contents.remove(title);
    if (result == false) {
        throw new Exception(title + " not in cart.");
    }
}

```

```

public List<String> getContents() {
    return contents;
}

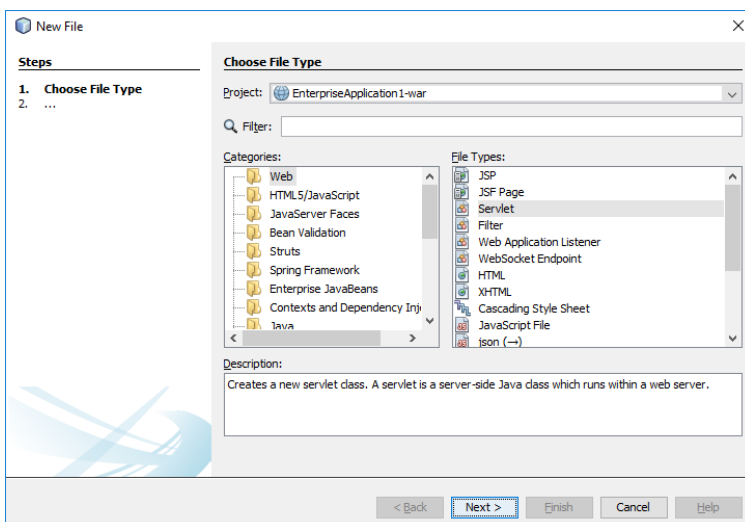
```

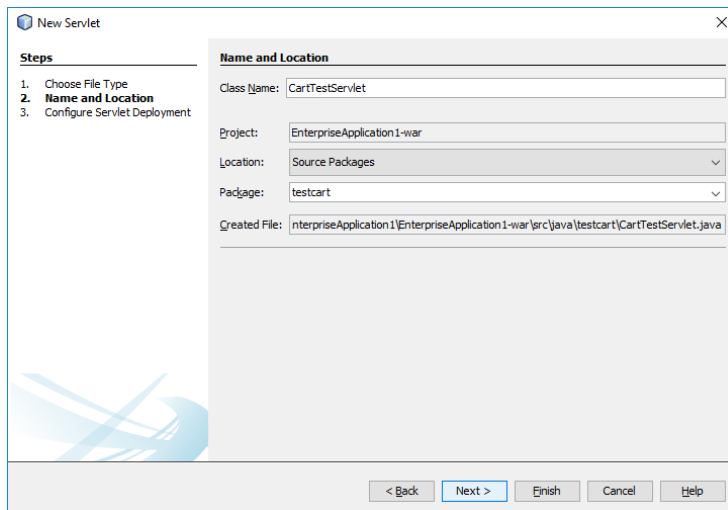
@Remove

```

public void remove() {
    contents = null;
}
}

```





package testcart;

```
import cart.CartBeanLocal;
import java.io.*;
import java.util.*;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.naming.*;
import javax.servlet.*;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.*;
```

```
@WebServlet(name = "CartTestServlet", urlPatterns = {"/CartTestServlet"})
public class CartTestServlet extends HttpServlet {
```

```
    CartBeanLocal cartBean = lookupCartBeanLocal();
```

```
    @Override
```

```
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try{
            cartBean.initialize("ABC", "123");
        } catch (Exception e) {}
        cartBean.addBook("Java 8 Cookbook");
        cartBean.addBook("Enterprise Java 7 ");
        cartBean.addBook("Java for Dummies");
        cartBean.addBook("Learn Java 8");
```

```
        try (PrintWriter out = response.getWriter()) {
```

```

try{

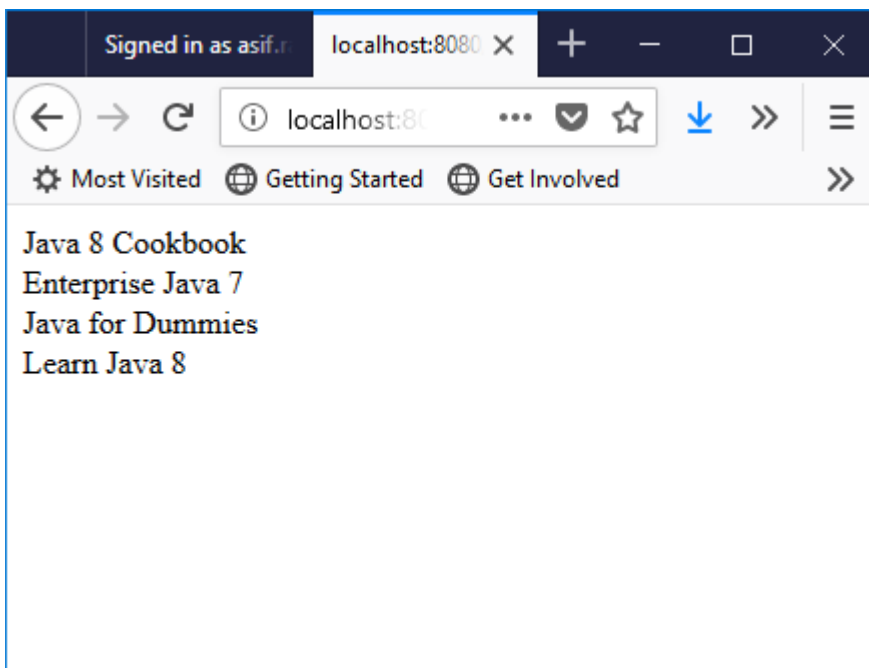
    List<String> books = cartBean.getContents();

    for( String s : books)
        out.println(s + "<br />");

    }catch(Exception e){}
    }
}

private CartBeanLocal lookupCartBeanLocal() {
    try {
        Context c = new InitialContext();
        return (CartBeanLocal) c.lookup("java:global/EnterpriseApplication1/EnterpriseApplication1-
ejb/CartBean!cart.CartBeanLocal");
    } catch (NamingException ne) {
        Logger.getLogger(getClass().getName()).log(Level.SEVERE, "exception caught", ne);
        throw new RuntimeException(ne);
    }
}
}

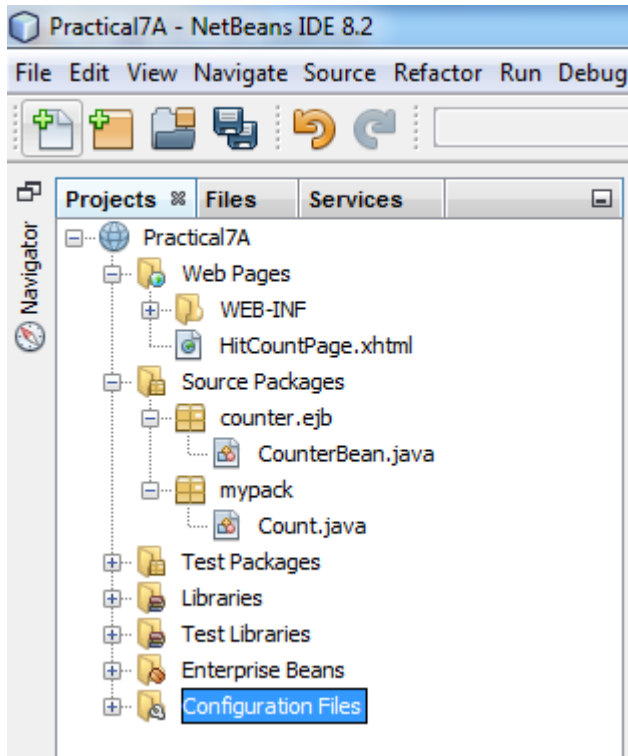
```





**7a.** Develop simple EJB application to demonstrate Servlet Hit count using Singleton Session Beans.

### Organization of file in Project Folder



#### ----- CounterBean.java -----

```
package counter.ejb;
import javax.ejb.Singleton;

@Singleton
public class CounterBean {
    private int hits = 1;

    // Increment and return the number of hits
    public int getHits() {
        return hits++;
    }
}
```

#### ----- Count.java -----

```
package mypack;
import java.io.Serializable;
import javax.ejb.EJB;
import javax.enterprise.context.ConversationScoped;
import javax.inject.Named;
import counter.ejb.CounterBean;
@Named("count")
@ConversationScoped
public class Count implements Serializable {
    @EJB
```

```

private CounterBean counterBean;

private int hitCount;

public Count() {
    this.hitCount = 0;
}

public int getHitCount() {
    hitCount = counterBean.getHits();
    return hitCount;
}

public void setHitCount(int newHits) {
    this.hitCount = newHits;
}
}

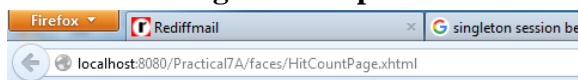
```

```

----- HitCountPage.xhtml -----
<?xml version='1.0' encoding='UTF-8' ?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
    xmlns:h="http://xmlns.jcp.org/jsf/html">
<h:head>
<title>Page Hit Counter Using Singleton Session Bean ~~~~ </title>
</h:head>
<h:body>
<h1>Welcome to Hit Count Page</h1>
    Page was hit #{count.hitCount} times
</h:body>
</html>

```

### Run this file to get the output



## Welcome to Hit Count Page

Page was hit 4 times

**7b.** Develop simple visitor Statistics application using Message Driven Bean [Stateless Session Bean].

**7c.** Develop simple Marks Entry Application to demonstrate accessing Database using EJB.

<Any application to the best of Teachers assumption >

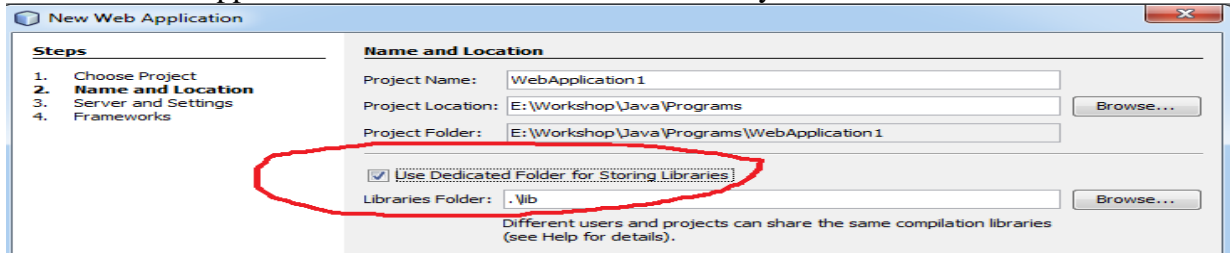
**8a.** Develop a simple Inventory Application Using JPA.

**8b.** Develop a Guestbook Application Using JPA.

JPA Practical using GuestBook

Steps:

1. Create Web Application with dedicated folder for Library



2. Add Simple java class or Persistent Entity class from Database (code below GuestBook.java)

3. Add SQL Connector Jar file to Library

4. Create Persistence Unit using jdbc connection to MySQL database

5. Create the JSP files (codes given below)

6. Run the Application.

GuestBook.java

~~~~~

```
package asif;
import javax.persistence.*;
```

@Entity

@Table(name="GuestBook")

```
public class GuestBook {
```

```
    @Id
```

```
    @GeneratedValue(strategy = GenerationType.IDENTITY)
```

```
    @Column(name="VisitorNo", unique=true, updatable=false)
```

```
    private Integer visitorNo;
```

```
    @Column(name="VisitorName")
```

```
    private String visitorName;
```

```
    @Column(name="Message")
```

```
    private String message;
```

```
    @Column(name="MessageDate")
```

```
    private String messageDate;
```

```
    public GuestBook() {
    }
}
```

```
    public Integer getVisitorNo() {
        return visitorNo;
    }
}
```

```
    public void setVisitorNo(Integer visitorNo) {
        this.visitorNo = visitorNo;
    }
}
```

```
    public String getVisitorName() {
        return visitorName;
    }
}
```

```
}  
public void setVisitorName(String visitorName) {  
    this.visitorName = visitorName;  
}  
  
public String getMessage() {  
    return message;  
}  
public void setMessage(String message) {  
    this.message = message;  
}  
  
public String getMessageDate() {  
    return messageDate;  
}  
public void setMessageDate(String messageDate) {  
    this.messageDate = messageDate;  
}  
}
```

index.jsp

~~~~~

```
<% @page contentType="text/html" pageEncoding="UTF-8"%>  
<!DOCTYPE html>  
<html>  
    <body style="background-color: pink;">  
        Sign the Guest Book  
        <form action="GuestBookView.jsp" method="post">  
            Visitor Name: <input name="guest" maxlength="25" size="50" />  
            Message: <textarea rows="5" cols="36" name="message"></textarea>  
            <input type="submit" name="btnSubmit" value="Submit" />  
        </form>  
    </body>  
</html>
```

GuestBookView.jsp

~~~~~

```
<% @page import="java.util.*,javax.persistence.*,asif.GuestBook" %>  
<% @page contentType="text/html" pageEncoding="UTF-8"%>  
<!DOCTYPE html>  
<%!  
    private EntityManagerFactory entityManagerFactory;  
    private EntityManager entityManager;  
    private EntityTransaction entityTransaction;  
    List<GuestBook> guestbook;  
%>  
<%
```

```

entityManagerFactory = Persistence.createEntityManagerFactory("JPAApplication1PU");
entityManager = entityManagerFactory.createEntityManager();
String submit = request.getParameter("btnSubmit");
if(submit != null && ("Submit").equals(submit)) {
    try {
        String guest = request.getParameter("guest");
        String message = request.getParameter("message");
        String messageDate = new java.util.Date().toString();

        GuestBook gb = new GuestBook();
        gb.setVisitorName(guest);
        gb.setMessage(message);
        gb.setMessageDate(messageDate);

        entityTransaction = entityManager.getTransaction();
        entityTransaction.begin();
        entityManager.persist(gb);
        entityTransaction.commit();
    } catch (RuntimeException e) {
        if(entityTransaction != null) entityTransaction.rollback();
        throw e;
    }
    response.sendRedirect("GuestBookView.jsp");
}

try {
    guestbook = entityManager.createQuery("SELECT g from GuestBook g").getResultList();
} catch (RuntimeException e) { }
entityManager.close();
%>
<html>
<body>
    View the Guest Book <b>Click <a href="index.jsp"> here</a> to sign the guestbook.</b>

    <hr />
    <%
        Iterator iterator = guestbook.iterator();
        while (iterator.hasNext()) {
            GuestBook obj = (GuestBook) iterator.next();
            %>
            On <%= obj.getMessageDate() %>,<br />
            <b><%= obj.getVisitorName() %>:</b>
            <%= obj.getMessage() %>
            <br /><br />
            <%
            }
            %>
        }
    %>

</body>
</html>

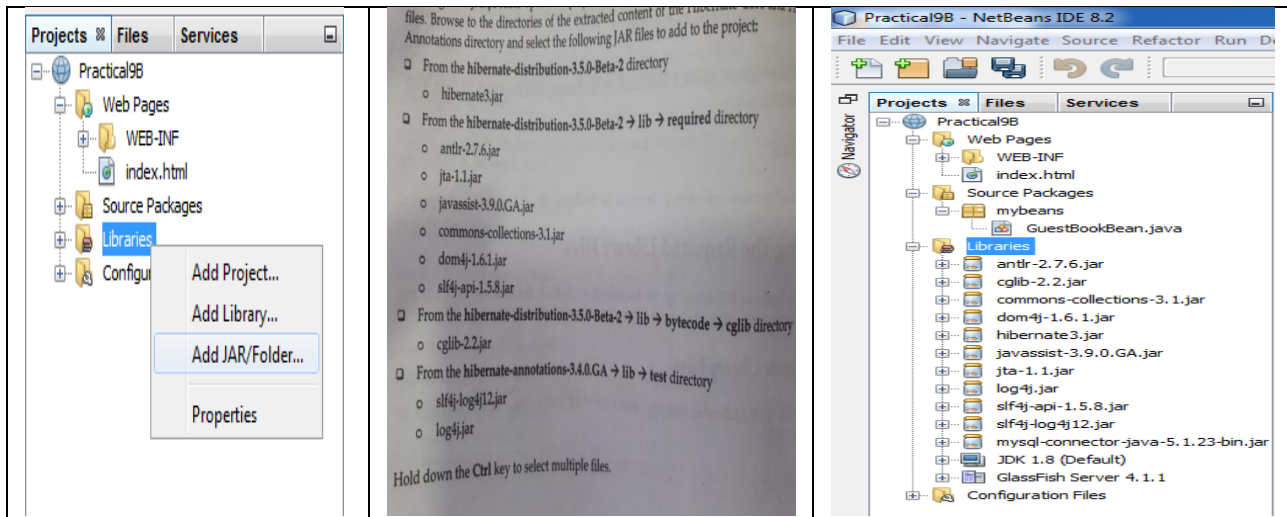
```

**8c.** Create simple JPA application to store and retrieve Book details.<< **similar to above example** >>

**9a.** Develop a JPA Application to demonstrate use of ORM associations.

**9b.** Develop a Hibernate application to store Feedback of Website Visitor in MySQL Database.

```
create database feedbackdb;
create table GuestBook(
vno int PRIMARY KEY AUTO_INCREMENT,
vname varchar(50),
msg varchar(100),
mdate varchar(50)
)
```



----- GuestBookBean.java -----

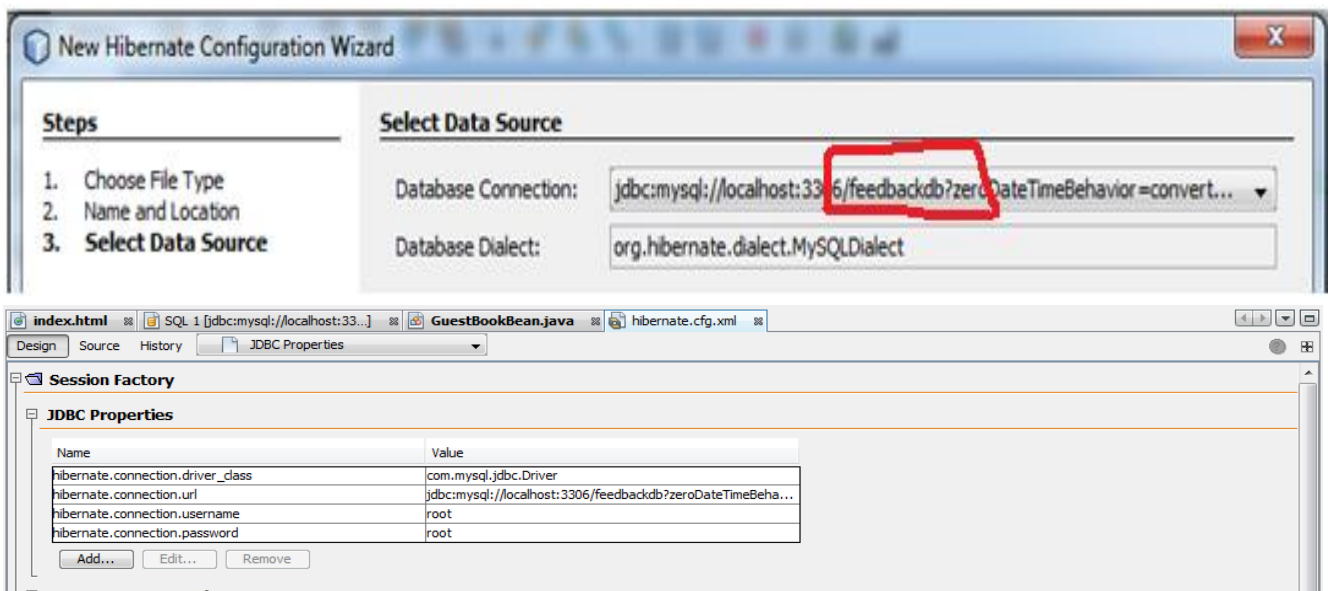
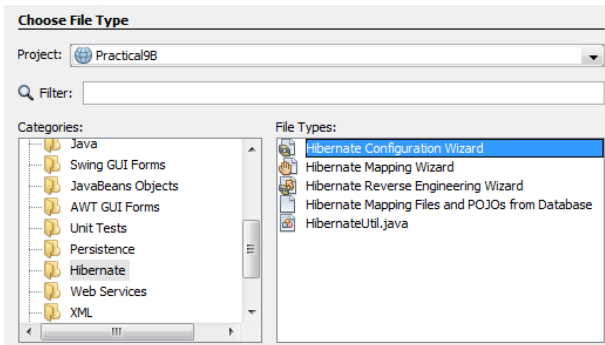
```
package mypack;
import javax.persistence.*;
@Entity
@Table(name="guestbook")
public class GuestBookBean implements java.io.Serializable {
    @Id
    @GeneratedValue
    @Column(name="vno")
    private Integer visitorNo;
    @Column(name="vname")
    private String visitorName;
    @Column(name="msg")
    private String msg;
    @Column(name="mdate")
    private String msgDate;
    public GuestBookBean() { }
    public Integer getVisitorNo() { return visitorNo; }
    public String getVisitorName() { return visitorName; }
    public String getMsg() { return msg; }
    public String getMsgDate() { return msgDate; }
    public void setVisitorNo(Integer vn) { visitorNo = vn ; }
```

```

public void setVisitorName(String vn) { visitorName = vn; }
public void setMsg(String m) { msg = m; }
public void setMsgDate(String md) { msgDate=md; }
}

```

Source packages → new → others → select category Hibernate → Hibernate Configuration Wizard



<hibernate-configuration>

<session-factory>

<property name="hibernate.dialect">org.hibernate.dialect.MySQLDialect</property>

<property name="hibernate.connection.driver\_class">com.mysql.jdbc.Driver</property>

<property

name="hibernate.connection.url">jdbc:mysql://localhost:3306/feedbackdb?zeroDateTimeBehavior=convertToNull</property>

<property name="hibernate.connection.username">root</property>

<property name="hibernate.connection.password">root</property>

<mapping class="mypack.GuestBookBean" />

</session-factory>

</hibernate-configuration>

----- index.html -----

<h1>Website Feedback Form for google.con </h1>

<form action="fb.jsp" >

Enter Your Name: <input type="text" name="name" ><br>

Enter Your Message : <textarea rows="10" cols="50" name="message" ></textarea><br>

<input type="submit" value="Submit My FeedBack " >

</form>

----- **fb.jsp** -----

```
<% @page import="org.hibernate.*, org.hibernate.cfg.*, mypack.*" %>
```

```
<%!           sessionFactory sf;
```

```
           org.hibernate.Session hibSession;
```

```
%>
```

```
<%
```

```
sf = new Configuration().configure().buildSessionFactory();
```

```
hibSession = sf.openSession();
```

```
Transaction tx = null;
```

```
GuestBookBean gb = new GuestBookBean();
```

```
try{
```

```
tx = hibSession.beginTransaction();
```

```
String username = request.getParameter("name");
```

```
String usermsg = request.getParameter("message");
```

```
String nowtime = ""+new java.util.Date();
```

```
gb.setVisitorName(username);
```

```
gb.setMsg(usermsg);
```

```
gb.setMsgDate(nowtime);
```

```
hibSession.save(gb);
```

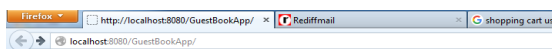
```
tx.commit();
```

```
out.println("Thank You for your valuable feedback....");
```

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

```
hibSession.close();
```

```
%>
```



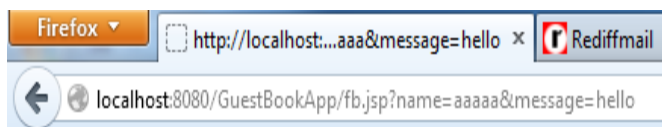
**Website Feedback Form for google.com**

Enter Your Name: aaaaa

hello

Enter Your Message :

Submit My FeedBack



Thank You for your valuable feedback....

**9c.** Develop a Hibernate application to store and retrieve employee details in MySQL Database.

<<Similar to above application>>

**10a.** Develop an application to demonstrate Hibernate One- To -One Mapping Using Annotation.

**10b.** Develop Hibernate application to enter and retrieve course details with ORM Mapping.

**10c.** Develop a five page web application site using any two or three Java EE Technologies.

<<Any application to the best of teachers own assumption >>

**Dear Teacher, your valuable feedback and contribution is welcome to make this manual more effective on [dandhiren@vahoo.co.in](mailto:dandhiren@vahoo.co.in) and/or [shaikh.aa@rediffmail.com](mailto:shaikh.aa@rediffmail.com)**