|  |  |  |  |
| --- | --- | --- | --- |
| **Ex. No. 02** | **DESIGNING AN ENTERPRISE APPLICATION USING SERVLET – ONLINE QUIZ** | | |
| Date of Exercise |  | Date of Output Verification |  |

**Aim**

To develop and deploy the Enterprise Application using Servlets for Online Quiz.

**Description**

Java Servlets are programs that run on a Web or Application server and act as a middle layer between a request coming from a Web browser or other HTTP client and databases or applications on the HTTP server. Using Servlets, you can collect input from users through web page forms, present records from a database or another source, and create web pages dynamically.

Java Servlets often serve the same purpose as programs implemented using the Common Gateway Interface (CGI). But Servlets offer several advantages in comparison with the CGI.

* Performance is significantly better.
* Servlets execute within the address space of a Web server. It is not necessary to create a separate process to handle each client request.
* Servlets are platform-independent because they are written in Java.
* Java security manager on the server enforces a set of restrictions to protect the resources on a server machine. So servlets are trusted.
* The full functionality of the Java class libraries is available to a servlet. It can communicate with applets, databases, or other software via the sockets and RMI mechanisms that you have seen already.

Servlets Tasks:

* Servlets perform the following major tasks:
* Read the explicit data sent by the clients (browsers). This includes an HTML form on a Web page or it could also come from an applet or a custom HTTP client program.
* Read the implicit HTTP request data sent by the clients (browsers). This includes cookies, media types and compression schemes the browser understands, and so forth.
* Process the data and generate the results. This process may require talking to a database, executing an RMI or CORBA call, invoking a Web service, or computing the response directly.
* Send the explicit data (i.e., the document) to the clients (browsers). This document can be sent in a variety of formats, including text (HTML or XML), binary (GIF images), Excel, etc.
* Send the implicit HTTP response to the clients (browsers). This includes telling the browsers or other clients what type of document is being returned (e.g., HTML), setting cookies and caching parameters, and other such tasks.

**Procedure**

* Open NetBeans IDE
* Create new java web Project
* Right click on the project and create a new servlet
* Give the name of the servlet and click next
* Check the option to add the information to web,xml and click finish
* Implement the servlets to handle the business logic
* And use requestDispatcher to redirect to another page using forward or include methods
* To use session variables use request.getattribute(‘name’)
* And to get the request variables, use request.getparameter(‘name’)

**Program**

Web.xml

<?xml version="1.0" encoding="UTF-8"?>

<web-app version="3.1" xmlns="http://xmlns.jcp.org/xml/ns/javaee" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee http://xmlns.jcp.org/xml/ns/javaee/web-app\_3\_1.xsd">

<servlet>

<servlet-name>Add</servlet-name>

<servlet-class>Add</servlet-class>

</servlet>

<servlet>

<servlet-name>LoginSignup</servlet-name>

<servlet-class>LoginSignup</servlet-class>

</servlet>

<servlet>

<servlet-name>Play</servlet-name>

<servlet-class>Play</servlet-class>

</servlet>

<servlet>

<servlet-name>Quiz</servlet-name>

<servlet-class>Quiz</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>Add</servlet-name>

<url-pattern>/Add</url-pattern>

</servlet-mapping>

<servlet-mapping>

<servlet-name>LoginSignup</servlet-name>

<url-pattern>/LoginSignup</url-pattern>

</servlet-mapping>

<servlet-mapping>

<servlet-name>Play</servlet-name>

<url-pattern>/Play</url-pattern>

</servlet-mapping>

<servlet-mapping>

<servlet-name>Quiz</servlet-name>

<url-pattern>/Quiz</url-pattern>

</servlet-mapping>

<session-config>

<session-timeout>

30

</session-timeout>

</session-config>

</web-app>

Index.html

<!DOCTYPE html>

<html>

<head>

<title>J2EE | Online Quiz</title>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<link rel="stylesheet" href="Extensions/bootstrap.min.css" />

<script src="Extensions/jquery-1.11.3.min.js"></script>

<style>

body{

background-image: url('a.jpg');

overflow-x: hidden;

}

#header{

background: rgba(0,0,0,0.3);

color: white;

margin-top: -20px;

height: 120px;

border: none;

padding: 0px;

/\*font-family: serif;\*/

}

#header h1{

padding-top: 20px;

}

form, #body{

width: 450px;

margin: 0px auto;

padding: 0px;

}

form{

background: rgba(0,0,0,0.4);

padding: 7px;

margin-top: 40px;

border-radius: 2px;

color: white;

border:1px white solid;

box-shadow: 0 0 5px black;

transition: box-shadow 1s ease;

}

form:hover{

box-shadow: 0 0 15px black;

}

#body{

margin-top: 50px;

}

.heading{

font-size: 2em;

margin:0 auto;

}

ul{

margin-left: 70px

}

ul li{

display: inline;

padding: 10px 15px;

cursor: pointer;

background: rgba(0,0,0,0.3);

transition: background 0.3s ease;

margin-left: 20px;

border-radius: 2px;

color: white;

}

ul li:hover{

background: rgba(0,0,255,0.2);

color: black;

}

</style>

<script>

$(document).ready(function () {

$("#signupform").hide();

$("#signinclick").click(function () {

$("#signupform").slideUp();

$("#signinform").slideDown();

});

$("#signupclick").click(function () {

$("#signinform").slideUp();

$("#signupform").slideDown();

});

});

</script>

</head>

<body>

<div id="header">

<h1>Online Quiz</h1>

</div>

<div id="body">

<ul id="tabs">

<li id="signinclick">SignIn</li>

<li id="signupclick">SignUp</li>

</ul>

<form id="signinform" class="form-horizontal" action="LoginSignup" method="post">

<p class="heading">Login</p>

<div class="form-group">

<label for="signin\_username" class="control-label col-sm-3">Username</label>

<div class="col-sm-8">

<input type="text" name="signin\_username" id="signin\_username" placeholder="Enter Username" class="form-control" required>

</div>

</div>

<div class="form-group">

<label for="signin\_password" class="control-label col-sm-3">Password</label>

<div class="col-sm-8">

<input type="password" name="signin\_password" id="signin\_password" placeholder="Enter Password" class="form-control" required>

</div>

</div>

<div class="form-group">

<div class="col-sm-offset-8">

<input type="submit" name="submit\_button" class="btn btn-default" value="SignIn" />

</div>

</div>

</form>

<form id="signupform" class="form-horizontal" action="LoginSignup" method="post">

<p class="heading">Sign Up</p>

<div class="form-group">

<label for="signup\_fullname" class="control-label col-sm-3">Full Name</label>

<div class="col-sm-8">

<input type="text" name="signup\_fullname" id="signup\_fullname" placeholder="Enter Full Name" class="form-control" required>

</div>

</div>

<div class="form-group">

<label for="signup\_username" class="control-label col-sm-3">Username</label>

<div class="col-sm-8">

<input type="text" name="signup\_username" id="signup\_username" placeholder="Enter Username" class="form-control" required>

</div>

</div>

<div class="form-group">

<label for="signup\_email" class="control-label col-sm-3">Email</label>

<div class="col-sm-8">

<input type="email" name="signup\_email" id="signup\_email" placeholder="Enter Email" class="form-control" required>

</div>

</div>

<div class="form-group">

<label for="signup\_dob" class="control-label col-sm-3">Date of Birth</label>

<div class="col-sm-8">

<input type="date" name="signup\_dob" id="signup\_dob" class="form-control">

</div>

</div>

<div class="form-group">

<label for="signup\_Password" class="control-label col-sm-3">Password</label>

<div class="col-sm-8">

<input type="password" name="signup\_Password" id="signup\_Password" placeholder="Enter Password" class="form-control" required>

</div>

</div>

<div class="form-group">

<div class="col-sm-offset-8">

<input type="submit" name="submit\_button" class="btn btn-default" value="SignUp" />

</div>

</div>

</form>

</div>

</body>

</html>

Quizstyle.html

<html>

<head>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<link rel="stylesheet" href="Extensions/bootstrap.min.css" />

<script src="Extensions/jquery-1.11.3.min.js"></script>

<style>

body{

background: url('a.jpg');

}

.form-control{

margin-top: 5px;

margin-bottom: 3px;

width: 300px;

}

#df{

width:500px; margin: 0 auto; padding-top:30px;

background: rgba(0,0,0,0.5);

padding: 20px;

color:white;

box-shadow: 0 0 3px black;

border:1px white solid;

}

#df:hover{

box-shadow: 0 0 7px black;

}

table{

color:white;

}

</style>

</head>

</html>

Add.java

import java.io.IOException;

import java.io.PrintWriter;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.Statement;

import javax.servlet.RequestDispatcher;

import javax.servlet.ServletException;

import javax.servlet.http.HttpServlet;

import javax.servlet.http.HttpServletRequest;

import javax.servlet.http.HttpServletResponse;

public class Add extends HttpServlet {

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

response.setContentType("text/html;charset=UTF-8");

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

String category = request.getParameter("category");

String question = request.getParameter("question");

String option1 = request.getParameter("option1");

String option2 = request.getParameter("option2");

String option3 = request.getParameter("option3");

String option4 = request.getParameter("option4");

String answer = request.getParameter("answer");

Class.forName("org.apache.derby.jdbc.ClientDriver");

Connection con = DriverManager.getConnection("jdbc:derby://localhost:1527/J2EE-Lab-Experiments", "ws", "6477");

String query = "insert into WS.QUIZ values('" + category + "', '" + question + "', '" + option1 + "', '" + option2 + "', '" + option3 + "', '" + option4 + "', '" + answer + "')";

Statement st = con.createStatement();

int a = st.executeUpdate(query);

RequestDispatcher rd;

if (a == 1) {

out.print("<script>alert('Your Question Added Sucessfully');</script>");

rd = request.getRequestDispatcher("Quiz");

rd.include(request, response);

} else {

out.print("Error");

rd = request.getRequestDispatcher("Quiz");

rd.include(request, response);

}

} catch (Exception ex) {

System.out.println(ex);

}

}

@Override

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

processRequest(request, response);

}

@Override

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

processRequest(request, response);

}

@Override

public String getServletInfo() {

return "Short description";

}// </editor-fold>

}

LoginSignup.java

import java.io.IOException;

import java.io.PrintWriter;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.ResultSet;

import java.sql.SQLException;

import java.sql.Statement;

import javax.servlet.RequestDispatcher;

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 LoginSignup extends HttpServlet {

@Override

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

try {

PrintWriter out = response.getWriter();

response.setContentType("text/html;charset=UTF-8");

HttpSession hs = request.getSession();

String sbutton = request.getParameter("submit\_button");

switch (sbutton) {

case "SignIn": {

String username = request.getParameter("signin\_username");

String password = request.getParameter("signin\_password");

Class.forName("org.apache.derby.jdbc.ClientDriver");

Connection con = DriverManager.getConnection("jdbc:derby://localhost:1527/J2EE-Lab-Experiments", "ws", "6477");

String query = "select name from WS.REGISTERED\_USERS where USERNAME='" + username + "' and PASSWORD='" + password.hashCode() + "'";

Statement st = con.createStatement();

ResultSet rs = st.executeQuery(query);

if (rs.next()) {

hs.setAttribute("username", rs.getString("name"));

RequestDispatcher rd = request.getRequestDispatcher("Quiz");

rd.include(request, response);

} else {

out.println("<div class='container alert alert-danger'>Invalid Username or Password, Try Again!....</div>");

RequestDispatcher rd = request.getRequestDispatcher("/index.html");

rd.include(request, response);

}

break;

}

case "SignUp": {

String name = request.getParameter("signup\_fullname");

String username = request.getParameter("signup\_username");

String email = request.getParameter("signup\_email");

String dob = request.getParameter("signup\_dob");

String pwd = request.getParameter("signup\_Password");

Class.forName("org.apache.derby.jdbc.ClientDriver");

Connection con = DriverManager.getConnection("jdbc:derby://localhost:1527/J2EE-Lab-Experiments", "ws", "6477");

String query = "insert into ws.Registered\_users values('" + name + "', '" + username + "', '" + email + "', '" + dob + "', '" + pwd.hashCode() + "')";

Statement st = con.createStatement();

int a = st.executeUpdate(query);

if (a == 1) {

hs.setAttribute("username", name);

RequestDispatcher rd = request.getRequestDispatcher("Quiz");

rd.include(request, response);

} else {

out.print("Registration Error");

RequestDispatcher rd = request.getRequestDispatcher("/index.html");

rd.include(request, response);

}

break;

}

default:

out.println("Invalid Request");

break;

}

} catch (IOException | ClassNotFoundException | SQLException | ServletException ex) {

System.out.println(ex);

}

}

}

Play.java

import java.io.IOException;

import java.io.PrintWriter;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.ResultSet;

import java.sql.Statement;

import javax.servlet.RequestDispatcher;

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 Play extends HttpServlet {

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

response.setContentType("text/html;charset=UTF-8");

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

HttpSession hs = request.getSession();

int score = 0, count = 1;

String category, choice = "", ans = "";

if (request.getParameter("submitanswer") != null) {

String submit\_button = request.getParameter("submitanswer");

if (submit\_button.equals("Next Question")) {

score = (int) hs.getAttribute("score");

count = (int) hs.getAttribute("count");

choice = request.getParameter("choice");

ans = hs.getAttribute("ans").toString();

if (ans == null ? choice == null : ans.equals(choice)) {

score++;

}

count++;

}

}

if (request.getParameter("category") != null) {

category = request.getParameter("category");

} else {

category = hs.getAttribute("category").toString();

}

Class.forName("org.apache.derby.jdbc.ClientDriver");

Connection con = DriverManager.getConnection("jdbc:derby://localhost:1527/J2EE-Lab-Experiments", "ws", "6477");

String query = "select \* from WS.QUIZ where category='" + category + "'";

Statement st = con.createStatement();

ResultSet rs = st.executeQuery(query);

RequestDispatcher rd = request.getRequestDispatcher("/quizstyle.html");

rd.include(request, response);

out.println("<body style='overflow-x:hidden;'>"

+ "<p style='position:relative;left:70%;font-size:1.3em; color:white; display:inline;'>Welcome " + hs.getAttribute("username") + "<form action=index.html method=post style='display:inline;'><input class='btn btn-default' type=submit value=Logout></form></p>"

+ "Quesiton Count : " + count + "<br>Current Score : " + score + "<br>Previous Choice : " + choice + "<br>Previous Answer : " + ans

+ "<br>Correct Percentage: " + (score \* 100 / count) + "%"

+ "<br><form action=Play?category=" + category + " method=post>");

for (int i = 0; i <= count; i++) {

rs.next();

}

out.println("<div id='df'><p style='padding:10px 0px;font-size:1.3em; margin:0 auto;'>Question:</p>"

+ "<p style='margin-left:20px;'>" + rs.getString(2) + "</p>"

+ "<p style='padding:10px 0px;font-size:1.3em; margin:0 auto;'>Options:</p>" + ""

+ "<table style='margin-left:20px;'>"

+ "<tr>"

+ "<td>1)&nbsp;&nbsp;" + rs.getString(3)

+ "</td>"

+ "</tr>"

+ "<tr>"

+ "<td>2)&nbsp;&nbsp;" + rs.getString(4)

+ "</td>"

+ "</tr>"

+ "<tr>"

+ "<td>3)&nbsp;&nbsp;" + rs.getString(5)

+ "</td>"

+ "</tr>"

+ "<tr>"

+ "<td>4)&nbsp;&nbsp;" + rs.getString(6)

+ "</td>"

+ "</tr>"

+ "</table>"

+ "<br><input type=text class='form-control' placeholder='Enter Your Option' name=choice style='margin-left:30px;'>"

+ "<input type=submit class='form-control col-sm-offset-6' style='width:auto;' name=submitanswer value='Next Question'>"

+ "</form>"

+ "</div>");

hs.setAttribute("score", score);

hs.setAttribute("count", count);

hs.setAttribute("category", category);

hs.setAttribute("ans", rs.getString(7));

} catch (Exception e) {

System.out.println(e);

}

}

@Override

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

processRequest(request, response);

}

@Override

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

processRequest(request, response);

}

@Override

public String getServletInfo() {

return "Short description";

}// </editor-fold>

}

Quiz.java

import java.io.IOException;

import java.io.PrintWriter;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.ResultSet;

import java.sql.Statement;

import javax.servlet.RequestDispatcher;

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 Quiz extends HttpServlet {

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

response.setContentType("text/html;charset=UTF-8");

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

Class.forName("org.apache.derby.jdbc.ClientDriver");

Connection con = DriverManager.getConnection("jdbc:derby://localhost:1527/J2EE-Lab-Experiments", "ws", "6477");

String query = "select distinct category from WS.QUIZ";

Statement st = con.createStatement();

ResultSet rs = st.executeQuery(query);

HttpSession hs = request.getSession();

RequestDispatcher rd = request.getRequestDispatcher("/quizstyle.html");

rd.include(request, response);

out.println("<body style='overflow-x:hidden;'>"

+ "<p style='position:relative;left:70%;font-size:1.3em; color:white; display:inline;'>Welcome " + hs.getAttribute("username") + "<form action=index.html method=post style='display:inline;'><input class='btn btn-default' type=submit value=Logout></form></p>"

+ "<div style='width:600px; margin:0 auto;'>"

+ "<form action=Play method=post class='form' style='margin-top:30px;'>"

+ "<p style='font-size:1.4em;margin:0 auto;padding:10px'>Play Quiz</p>"

+ "<select name=category class='form-control'>");

while (rs.next()) {

out.println("<option class='form-control'>"

+ rs.getString("category")

+ "</option>");

}

out.println("</select>"

+ "<input type=submit class='btn btn-default' name=submit\_button value='Play Quiz'>"

+ "</form>"

+ "<form action=Add method=post class='form-horizantal'>"

+ "<p style='font-size:1.4em;margin:0 auto;padding:10px'>Add a Question to the Quiz</p>"

+ "<input class='form-control' type=text name=category placeholder='Enter Category'>"

+ "<input class='form-control' type=text name=question placeholder='Enter Question'>"

+ "<input class='form-control' type=text name=option1 placeholder='Enter Option1'>"

+ "<input class='form-control' type=text name=option2 placeholder='Enter Option2'>"

+ "<input class='form-control' type=text name=option3 placeholder='Enter Option3'>"

+ "<input class='form-control' type=text name=option4 placeholder='Enter Option4'>"

+ "<input class='form-control' type=text name=answer placeholder='Enter Answer'>"

+ "<input type=submit class='btn btn-default col-sm-offset-5' value='Add Question'>"

+ "</form>"

+ "</div>");

} catch (Exception e) {

System.out.println(e);

}

}

@Override

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

processRequest(request, response);

}

@Override

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

processRequest(request, response);

}

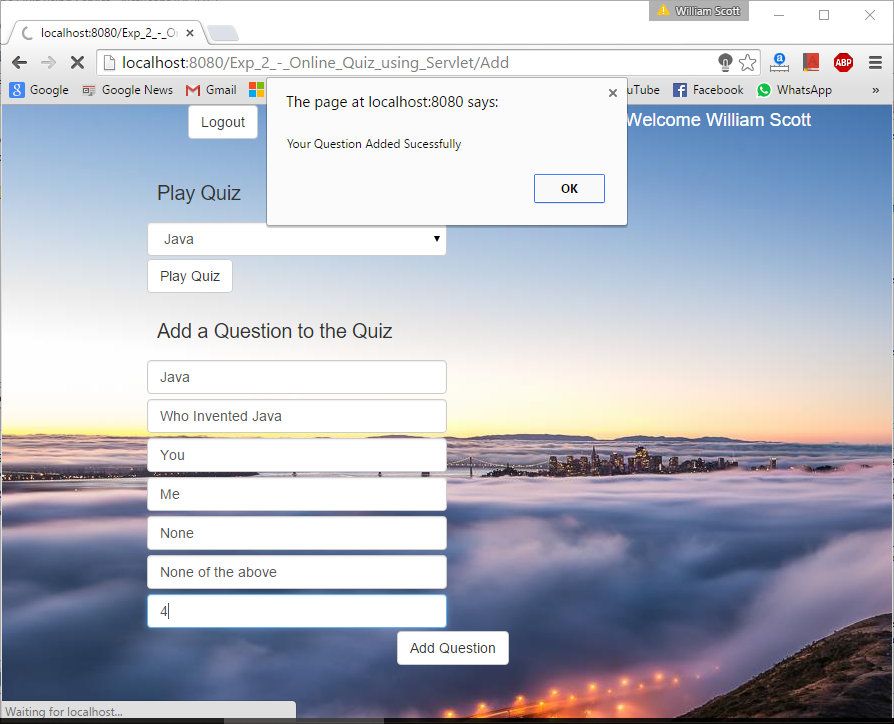
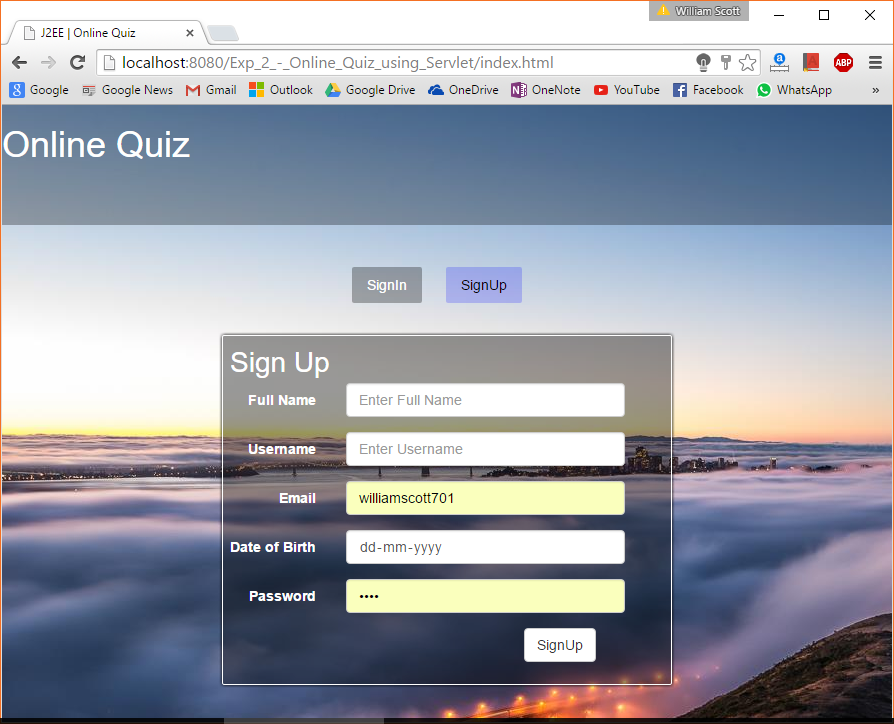
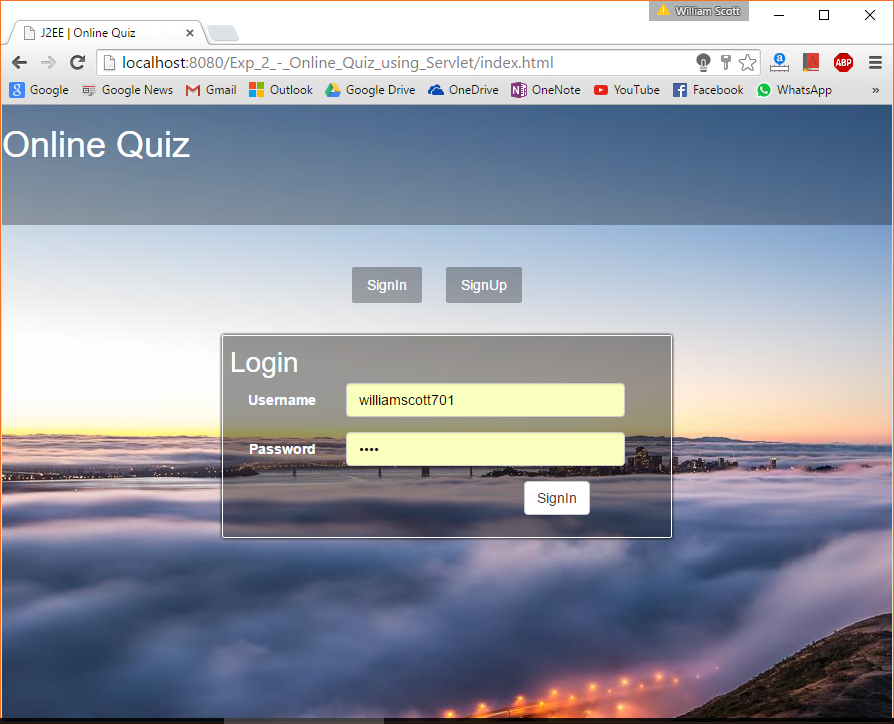
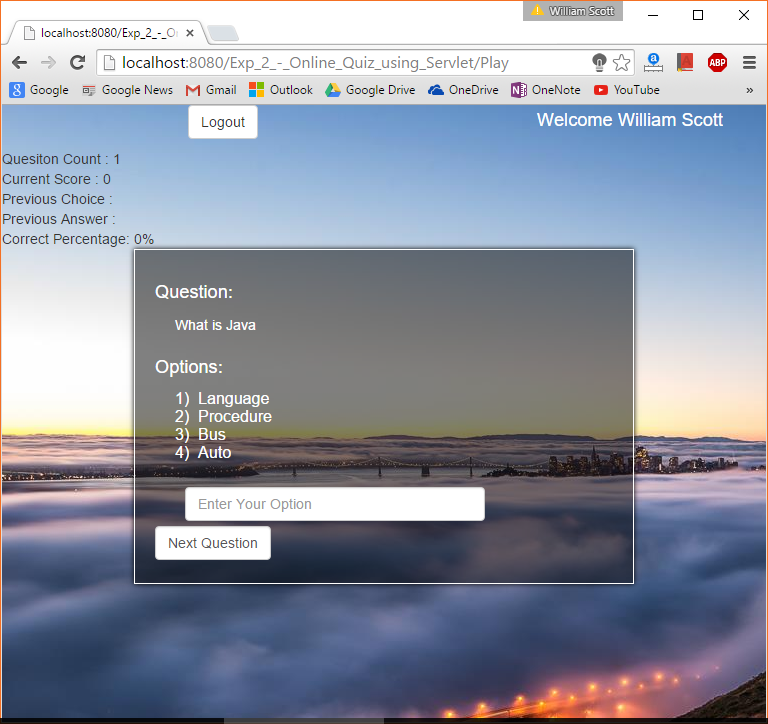
@Override

public String getServletInfo() {

return "Short description";

}

}

**Output** 

**Result**

Thus, the Enterprise Application using Servlets for online quiz was successfully developed and deployed

[Signature of the Staff In-charge]

[Name of the Staff In – charge]