UNIVERSITI MALAYSIA TERENGGANU

_____

CSM3023 WEB BASED APPLICATION DEVELOPMENT

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

Lab 2 – SERVLET: DATA SHARING AND DATABASE MANAGEMENT

SEMESTER 2 2023/2024

_____

PREPARED FOR:

ENCIK ARIZAL

PREPARED BY:

AMAL HAZIRAH BINTI SAIFUDDIN (S67202)

https://github.com/amalhazirah/AMALHAZIRAH

Task 1 : Data Sharing in Servlet

Login.html

```html
<html>
    <head>
        <title>Login Page</title>
        <style>
            body{
                background-color:black;
                text-align: left;
                color: white;
                font-family: Arial,Helvetica, sans-serif;
            }
        </style>
    </head>
    <body>
        <<h1>Welcome to CSF3107</h1><!-- comment -->
        <p>Please insert your username and password</p><!-- comment -->
        <form name="login" id="login" action="LoginServlet" method="POST" autocomplete="off">
            Username: <input name="txtUsername" type="text"><br><!-- comment -->
            Password:<input name="txtPassword" type="text"><br><!-- comment -->
            <br><!-- comment -->
            <input name="btnLogin" value="Login" type="submit">
            <input name="txtReset" value="Reset" type="reset"><br><!-- comment -->
        </form><!-- comment -->
        <p><br><!-- comment -->
        </p>

    </body>
</html>
```

AccountServlet.java

```java
import java.io.IOException;
import java.io.PrintWriter;
import java.util.HashMap;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;

/**
 *
 * @author Admin
 */
public class AccountServlet extends HttpServlet {
  HashMap<String,String[] > account = new HashMap();

  @Override
  public void init() throws ServletException{
      super.init();
      account.put("Ali",new String[]{"31/01/2019: 2000.00","28/02/2019:3000.00"});
      account.put("Ahmad", new String[]{"31/01/2019: 100.00","28/02/2019:5000.00"});
      account.put("Muthu",new String[]{"31/01/2019: 1000","28/02/2019:2000"});
  }
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {

protected void processRequest(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    try (PrintWriter out = response.getWriter()) {
        /* TODO output your page here. You may use following sample code. */
        out.println("<!DOCTYPE html>");
        out.println("<html>");
        out.println("<head>");
        out.println("<title>Servlet AccountServlet</title>");
        out.println("</head>");
        out.println("<body>");

        String userid_login = (String) request.getAttribute("userid");


        if(account.get(userid_login)==null){
            out.println("<h1>Sorry,no information found!</h1>");
        }
        else{
            out.println("<h1>Account status for: "+ userid_login + "</h1>");
            for(String tempAcc: account.get(userid_login)){
                out.println("<h2>"+tempAcc+"</h2>");
            }
        }
        out.println("</body>");
        out.println("</html>");

    }
}
```

LoginServlet.java

```java
import java.io.IOException;
import java.util.HashMap;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.RequestDispatcher;
import jakarta.servlet.ServletContext;

/**
 *
 * @author Admin
 */
public class LoginServlet extends HttpServlet {

    HashMap<String,String> users = new HashMap();

    @Override
    public void init() throws ServletException{
        super.init();
        users.put("Ali", "1234");
        users.put("Ahmad", "4567");
        users.put("Muthu", "8910");

    }

}
protected void processRequest(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");

    String username = request.getParameter("txtUsername");
    String password = request.getParameter("txtPassword");

    if(!username.equals("")&& !password.equals("")
        && users.get(username).equals(password)){
        request.setAttribute("userid", username);
        ServletContext sc = getServletContext();
        RequestDispatcher rd = sc.getRequestDispatcher("/AccountServlet");
        rd.forward(request, response);
    }else{
        RequestDispatcher rd = request.getRequestDispatcher("/login.html");
        rd.forward(request, response);
    }

} @Override
protected void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
    processRequest(request, response);
}
```
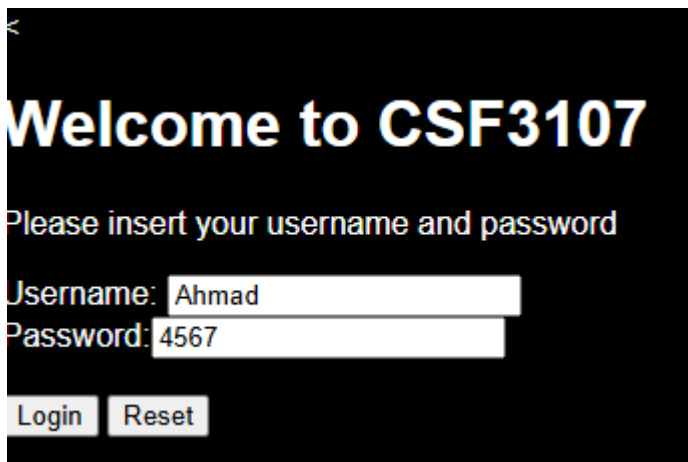
```
    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        processRequest(request, response);
    }

    @Override
    public String getServletInfo() {
        return "Short description";
    }
```

Output

Account status for: Ahmad

31/01/2019: 100.00

28/02/2019:5000.00

Reflections:
1. What have you you learnt from this exercise?

   I learnt how servlets are initialed using init() method to set up HaspMap, how servlet handle HTTP request(doget and doPost) .

2. What are the common methods used in Java Servlet?
   -intit()
   -doGet()
   -doPost()
   -processRequest()
   -getServletContext()

-getRequestDispatcher()

Task3 and Task4: Setting the Environment of Web Application for Database Connection & Using Sevlets for Database CRUD Operataions

Index.html

```html
<!DOCTYPE html>
<html>
    <head>
        <title>User Management</title>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    </head>
    <body>
        <h1>Add New User</h1>
        <form action="SaveServlet" method="post">
            <table>
                <tr><td>Username:</td><td><input type="text" name="name"/></td></tr>
                <tr><td>Password:</td><td><input type="password" name="password"/></td></tr><!-- comment -->
                <tr><td>Role:</td></tr><!-- comment -->
                    <select name="role" style="width:150px">
                        <option>admin</option>
                        <option>user</optio><!-- comment -->
                    </select><!-- comment -->
                </td></tr><!-- comment -->
                <tr><td colspan="2"><input type="submit" value="Save User"/></td></tr>

            </table>
        </form><!-- comment -->
        <br/><!-- comment -->
        <a href="ViewServlet">view users</a>
    </body>
</html>
```

User.java

```java
public class User {

    private int id;
    private String username,password,role;

    public int getId(){
        return id;
    }
    public void setId(int id){
        this.id=id;
    }
    public String getUsername(){
        return username;
    }
    public void setUsername(String username){
        this.username=username;
    }
    public String getPassword(){
        return password;
    }
    public void setPassword(String Password ){
        this.password = password;
    }
    public String getRole(){
        return role;
    }
    public void setRole(String Role ){
        this.role=role;
```

UserDAO..java

```java
import java.sql.PreparedStatement;
import jakarta.resource.cci.ResultSet;
import java.util.ArrayList;
import java.util.List;

public class UserDAO {

    public static Connection getConnection() {
        Connection con = null;
        try {
            Class.forName("com.mysql.jdbc.Driver");
            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/csf3l07", "root", "admin");
        } catch (Exception e) {
            System.out.println(e);
        }
        return con;
    }

    public static int save(User e) {
        int status = 0;
        try {
            Connection con = UserDAO.getConnection();
            PreparedStatement ps = con.prepareStatement(
                "insert into users(username,password,role) values(?,?,?)");
            ps.setString(1, e.getUsername());
            ps.setString(2, e.getPassword());
            ps.setString(3, e.getRole());
```

Connection.java

```java
import java.sql;

/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */

/**
 *
 * @author Admin
 */
class Connection {

    sql.PreparedStatement prepareStatement(String insert_into_usersusernamepasswordrole_val) {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from nbfs://nbhost/SystemFileSystem/Templates/Classes/Code/Gene
    }

    void close() {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from nbfs://nbhost/SystemFileSystem/Templates/Classes/Code/Gene
    }

}
```

SaveServlet.java

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

public class SaveServlet extends HttpServlet {
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        String name = request.getParameter("name");
        String password = request.getParameter("password");
        String role = request.getParameter("role");

        User e = new User();
        e.setUsername(name);
        e.setPassword(password);
        e.setRole(role);

        int status = UserDAO.save(e);
        if(status>0){
            out.print("<p>Record saved succesfully!</p>");
            request.getRequestDispatcher("index.html").include(request, response);
        }else{
            out.println("sorry! unable to save record");
        }
```

viewServlet.java

```java
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import java.util.List;

public class ViewServlet extends HttpServlet {
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
            out.println("<a href ='index.html>Add New User</a>");
            out.println("<h1>User List</h1>");

         List<User> list= UserDAO.getAllUsers();

        out.print("<table border='1' width='100%");
        out.print("<tr><th>Id</th><th>Name</th><th>Password</th><th>Role<?th>"
                + "<th>Edit</th><th>Delete</th></tr>");
        for(User e:list){
            out.print("<tr><td>"+e.getId()+"</td><td>"+e.getUsername()+"</td><td>"
                    +e.getPassword()+"</td><td>"+e.getRole()+"</td><td><a href='EditServlet?id="
                    +e.getId()+"'>edit</a></td> <td><a href='DeleteServlet?id="
                    +e.getId()+"'>delete</a></td></tr>");
        }
        out.print(">/table>");
        out.close();
    }
}
```

DriverManager.java

```java
class DriverManager {

    static Connection getConnection(String jdbcmysqllocalhost3306csf3107, String root, String admin) {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from nbfs://nbhost/SystemFileSystem/Templates/Classes/Code/Gene

    }

}
```

EditServlet.java

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

public class EditServlet extends HttpServlet {

    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
        out.println("<h1>Update User</h1>");
        String sid= request.getParameter("id");
        int id=Integer.parseInt(sid);

       User e=UserDAO.getUserById(id);
```

```java
        User e=UserDAO.getUserById(id);

        out.print("<form action='EditServlet2' method='post'>");
        out.print("<table>");
        out.print("<tr><td></td><td><input type='hidden' name='id' value='"
                +e.getId()+"'/></td></td>");
        out.print("<td><td>Name:</td><td><input type='text' name='username' value='"
                +e.getUsername()+"'/></td></tr>");
        out.print("<tr><td>Password:</td><td><input type='password' name='password' value'"
                +e.getPassword()+"'/></td></tr>");
    out.print("<tr><td>Role:</td><td>");
    out.print("<select name='role' style='width:150px'>");
    out.print("<option>admin</option>");
    out.print("<option>user</option>");
    out.print("</select>");
    out.print("</td></tr>");
    out.print("<tr><td colspan='2'><input type='submit' value='Edit & Save'/></td></tr>");
    out.print("<table>");
    out.print("</form>");

    out.close();
    }
}
```

EditServlet2.java

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

public class EditServlet2 extends HttpServlet {
 protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
      response.setContentType("text/html");
      PrintWriter out = response.getWriter();

    String name = request.getParameter("name");
    String password = request.getParameter("password");
    String role = request.getParameter("role");

    User e = new User();
     e.setUsername(name);
     e.setPassword(password);
     e.setRole(role);

     int status =UserDAO.save(e);
     if(status>0){
         out.print("<p>Record saved successfully!</p>");
         request.getRequestDispatcher("index.html").include(request, response);

    }else{
         out.println("Sorry!unable to save record");
    }
    out.close();
 }
```

DeleteServlet.java

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

/**
 *
 * @author Admin
 */
public class DeleteServlet extends HttpServlet {

    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        String sid = request.getParameter("id");
        int id = Integer.parseInt(sid);
        UserDAO.delete(id);
        response.sendRedirect("ViewServlet");
        }

    }
```

```
1    create table users(
2      id INT(11) primary key,
3      username VARCHAR(100),
4      password VARCHAR(225),
5      roles varchar(10)
6    );
7
8    insert into users (id,username,password, roles) values (NULL,'Ali','1234','admin'),(NULL,'Ahmad','4567','user');
9
10   select*from users
```

Output

Add New User

| admin ▾ |
| Username: | Ayub |
| Password: | •••• |
| Role: |
| Save User |

view users

Reflections:
1. What is the name of the Java Library that you need to import before coding
the web application with database operations?

JDBC

2. Which folder keeps the web.xml file? Copy the contents of the file and explain in brief the tags included such as <servlet-name><servlet-class> <servlet-mapping>. etc.
WEB.XML

3. Define the usage of Data Access Object (DAO) servlet. How it ease the business process in your servlet-based web application?

-dao servlets encapsulate with database
-business logic servlet can focus on processing user request and response
-easy to modify