# Administrative Portal for Learner Academy

This document contains sections for:



- The code for this project is hosted at **https://github.com/Dinesh123527/phase_2_project.**
- This project is developed by **G V Narasimha Raju.**

## Sprints planning and Task completion:

The project is planned to be completed in 1 sprint. Tasks assumed to be completed in the sprint are:

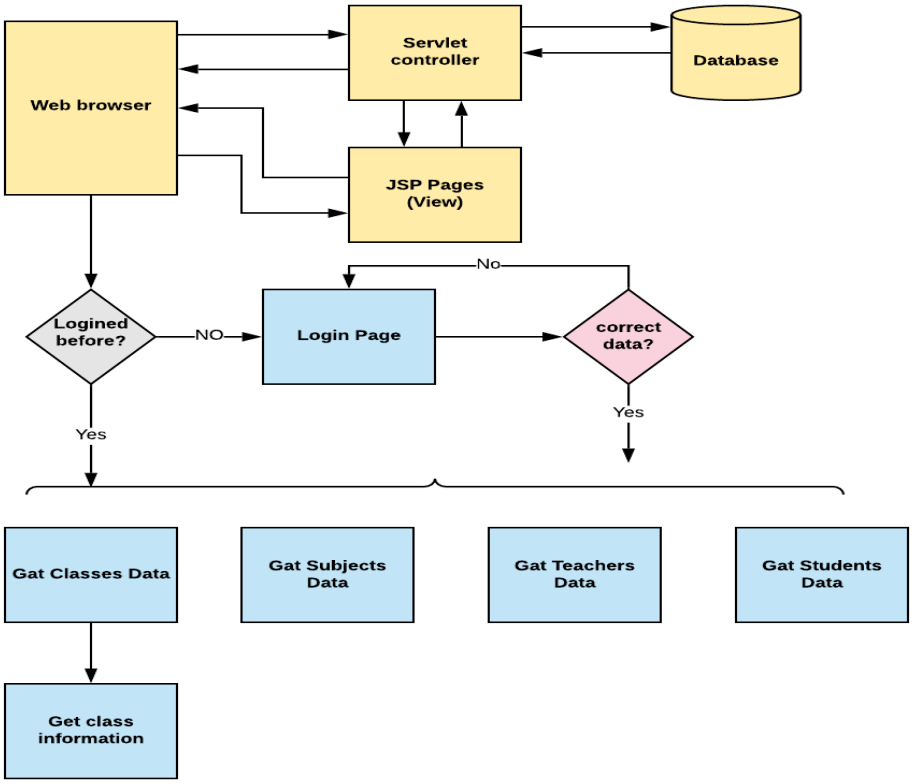
- Creating the flow of the application.
- Initializing the git repository to track changes as development progresses.
- Creating a Java EE Web application to fulfill user requirements.
- Create a Database to maintain the data used for the application.
- Testing the Java program on the local server with different scenarios.
- Pushing code to GitHub.
- Creating this specification document highlighting application capabilities, appearance, and user interactions.

## Technologies and Tools used in the project:

- **Servlet:** To do the business logic and works as controller for the project.
- **JSP:** To handle the presentation view.
- **SQL:** To create and manage the database.
- **JDBC:** To make operations on the database for the project.

- **CSS:** To format the contents.
- **MySQL:** To administrate and manage the database manually.
- **Eclipse:** To write and run the code.
- **Tomcat:** To run and deploy servlet application.

## Flow of the Application:




## Demonstrating the product capabilities, appearance, and user interactions:

To demonstrate the product capabilities, below are the sub-sections configured to highlight appearance and user interactions for the project.

- ✓ **Creating the project in Eclipse IDE.**

- ✓ **Create a new Dynamic Web Project (Java EE) and configure the Tomcat server to run the Web application.**
- ✓ **Configure the Tomcat Server for the project on the Servers tab in Eclipse.**
- ✓ **Create a Web Content/Web App folder to store all the HTML, XML, JSP, CSS files, and configuration files that are used for the project.**
- ✓ **Create a Servlet Controller to handle all the operations and configure the Database to store the data.**
- ✓ **Pushing the code to the GitHub repository.**

## **Step - 1:** Creating a new project in Eclipse

- Open Eclipse.
- Go to File -> New -> Dynamic Web Project->Next.
- Type in any project name and click on “Finish.”
- Select your project and go to File -> New -> JSP file.
- Enter **login.jsp** in file name, and click on “Finish.”

## **Step - 2:** Writing JSP Program to handle the presentation view

**login.jsp:**

```
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>

<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Login</title>
<link type="text/css" rel="stylesheet" href="css/login.css">
</head>
<body style="background-image: url('css/background.jpg');">
<div style="text-align: center;"> <h1> Admin Login </h1> </div>
  <form action="AdminControllerServlet" method="post">
```

```
        <div class="container">
          <input type="hidden" name="command" value="LOGIN" />
           <label>Username : </label>
           <br/>
           <input type="text" placeholder="Enter Username"           name="username"
required>
           <br/>
           <label>Password : </label>
           <br/>
           <input type="password" placeholder="Enter Password" name="password"
required>
           <br/>
           <button type="submit">Login</button>
           <br/>
           <input type="checkbox"> Remember me
        </div>
    </form>
</body>
</html>
```

## classes-list.jsp:

```
</body><%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>List of Classes</title>
<link type="text/css" rel="stylesheet" href="css/style.css">
</head>
<body style="background-image: url('css/background.jpg');">
        <div id="page">
                <jsp:include page="left-list.jsp" />


                <div id="wrapper">

                        <div id="header">
                                <h3>Classes</h3>
                        </div>
                </div>
                <div id="container">
                        <div id="content">
```

```
                    <table>
                        <tr>
                            <th>Section</th>
                            <th>Subject</th>
                            <th>Teacher</th>
                            <th>Time</th>
                            <th>List of Students</th>
                        </tr>

                        <c:forEach var="tempClass"
items="${CLASSES_LIST }">
                            <tr>

                                <c:url var="tempLink"
value="AdminControllerServlet">
                                    <c:param name="command"
value="ST_LIST" />
                                    <c:param name="classId"
value="${tempClass.id }" />
                                    <c:param name="section"
value="${tempClass.section }" />
                                    <c:param name="subject"
value="${tempClass.subject }" />
                                </c:url>
                                <td>${tempClass.section}</td>
                                <td>${tempClass.subject}</td>
                                <td>${tempClass.teacher}</td>
                                <td>${tempClass.time}</td>
                                <td><a href="${tempLink
}">List</a></td>
                            </tr>
                        </c:forEach>
                    </table>
                </div>
            </div>
        </div>
</html>
```

## class-students.jsp:

```
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>

<!DOCTYPE html>
```

```
<html>
<head>
<meta charset="ISO-8859-1">
<title>Students of a Class</title>
<link type="text/css" rel="stylesheet" href="css/style.css">
</head>
<body style="background-image: url('css/background.jpg');">
<div id="page" >
	<jsp:include page="left-list.jsp" />

		<div id="wrapper">
			<div id="header">
				<h3>Students of ${SUBJECT} class section ${SECTION}
</h3>
			</div>
		</div>
		<div id="container">
			<div id="content">
				<table>
					<tr>
						<th>First Name</th>
						<th>Last Name</th>
						<th>age</th>
					</tr>
					<c:forEach var="tempStudent"
items="${STUDENTS_LIST}">
						<tr>
							<td>${tempStudent.fname}</td>
							<td>${tempStudent.lname}</td>
							<td>${tempStudent.age}</td>
						</tr>
					</c:forEach>
				</table>
			</div>
		</div>
	</div>
</body>
</html>
```

**left-list.jsp:**

```
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
```

```
<div class="sidenav">
	<h3 id="logo">
		Administrative <br /> Academy Portal
	</h3>
	<c:url var="classesLink" value="AdminControllerServlet">
		<c:param name="command" value="CLASSES" />
	</c:url>

	<c:url var="subjectsLink" value="AdminControllerServlet">
		<c:param name="command" value="SUBJECTS" />
	</c:url>

	<c:url var="teachersLink" value="AdminControllerServlet">
		<c:param name="command" value="TEACHERS" />
	</c:url>

	<c:url var="studentsLink" value="AdminControllerServlet">
		<c:param name="command" value="STUDENTS" />
	</c:url>
	<a class="bar-item" href="${classesLink}">Classes</a>
		<a class="bar-item" href="${subjectsLink}">Subjects</a>
		<a class="bar-item" href="${teachersLink}">Teachers</a>
		<a class="bar-item" href="${studentsLink}">Students</a>
		<a class="bar-item" href="login.jsp">Log out</a>
</div>
```

**list-students.jsp:**

```
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>

<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>List of Students</title>
<link type="text/css" rel="stylesheet" href="css/style.css">
</head>
<body style="background-image: url('css/background.jpg');">
<div id="page" >
	<jsp:include page="left-list.jsp" />
		<div id="wrapper">
			<div id="header">
				<h3>Students</h3>
```

```
                </div>
            </div>
            <div id="container">
                <div id="content">
                    <table>
                        <tr>
                            <th>First Name</th>
                            <th>Last Name</th>
                            <th>age</th>
                        </tr>
                        <c:forEach var="tempStudent"
items="${STUDENT_LIST }">
                            <tr>
                                <td>${tempStudent.fname}</td>
                                <td>${tempStudent.lname}</td>
                                <td>${tempStudent.age}</td>
                            </tr>
                        </c:forEach>
                    </table>
                </div>
            </div>
        </div>
</body>
</html>
```

## subjects-list.jsp:

```
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>List of Teachers</title>
<link type="text/css" rel="stylesheet" href="css/style.css">
</head>
<body style="background-image: url('css/background.jpg');">
        <div id="page">
            <jsp:include page="left-list.jsp" />
            <div id="wrapper">
                <div id="header">
                    <h3>Subjects</h3>
                </div>
            </div>
```

```
		<div id="container">
			<div id="content">
				<table>
					<tr>
						<th>Name</th>
						<th>Shortcut</th>
					</tr>

					<c:forEach var="tempSubject"
items="${SUBJECTS_LIST }">
						<tr>
							<td>${tempSubject.name}</td>
							<td>${tempSubject.shortcut}</td>

						</tr>
					</c:forEach>
				</table>
			</div>
		</div>
	</div>
</body>
</html>
```

## teachers-list.jsp:

```
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>List of Teachers</title>
<link type="text/css" rel="stylesheet" href="css/style.css">
</head>
<body style="background-image: url('css/background.jpg');">
	<div id="page">
		<jsp:include page="left-list.jsp" />
		<div id="wrapper">
			<div id="header">
				<h3>Teachers</h3>
			</div>
		</div>
		<div id="container">
			<div id="content">
```

```
                        <table>
                            <tr>
                                <th>First Name</th>
                                <th>Last Name</th>
                                <th>age</th>
                            </tr>
                            <c:forEach var="tempStudent"
items="${TEACHERS_LIST }">
                                <tr>
                                    <td>${tempStudent.fname}</td>
                                    <td>${tempStudent.lname}</td>
                                    <td>${tempStudent.age}</td>
                                </tr>
                            </c:forEach>

                        </table>
                    </div>
                </div>
            </div>
</body>
</html>
```

**Step - 3:** Adding CSS for styling the web application

**style.css:**

```
html, body{

        padding:0px;
        font-family:Verdana, Arial, Helvetica, sans-serif;
        margin-left: 103px; /* Same as the width of the sidenav */
}

table {
        border-collapse:collapse;
        border:1px solid gray;
        font-family: Tahoma,Verdana,Segoe,sans-serif;
        width:72%;
}

th {
```

```
        border-bottom:1px solid gray;
        background:none repeat scroll 0 0 #0775d3;
        padding:10px;
        color: #FFFFFF;
}

tr {
        border-top:1px solid gray;
        text-align:center;
}

tr:nth-child(even) {background: #FFFFFF}
tr:nth-child(odd) {background: #BBBBBB}

#wrapper {width: 100%; text-align: center; }
#header {width: 72%; background: #0775d3; margin-top: 0px; padding:5px 0px 15px
0px;}
#header h3 {width: 100%; margin:auto; color: #FFFFFF;}
#container {width: 100%; margin:auto}
#container h3 {color: #000;}
#container #content {margin-top: 20px;}

.add-student-button {
        border: 1px solid #666;
        border-radius: 5px;
        padding: 4px;
        font-size: 12px;
        font-weight: bold;
        width: 120px;
        padding: 5px 10px;

        margin-bottom: 15px;
        background: #cccccc;
}

.sidenav  {
  height: 100%;
  width: 200px;
  border-color: #FFFFFF;
  position: fixed;
  z-index: 1;
  top: 0;
  left: 0;
  background-color: #000080;
```

```
  overflow-x: hidden;
  padding-top: 20px;
}

.sidenav a {
  padding: 6px 6px 6px 32px;
  text-decoration: none;
  font-size: 25px;
  color: white;
  display: block;
}

.sidenav a:hover {
  color: blue;
}

@media screen and (max-height: 450px) {
  .sidenav {padding-top: 15px;}
  .sidenav a {font-size: 18px;}
}

#page{
  height: 100%;
}

#logo{
        font-family: 'Trebuchet MS', sans-serif;
        text-align: center;
        color: white;
}

.bar-item{
                border-color: #FFFFFF;
                border-width: 3px;
                border-bottom: .5px solid rgba(255, 255, 255, 0.247);
}
```

**login.css:**

```
Body {
  font-family: Calibri, Helvetica, sans-serif;
  background-color: pink;
```

```
}
button {
            justify-content: center;
       background-color: #4CAF50;
       width: 100%;
        color: white;
        padding: 15px;
        margin: 10px 0px;
        border: none;
        cursor: pointer;
         }

 form {
        border: 1.4px solid black;
                    width: 45%;
                    margin: 0 auto;
    }
 input[type=text], input[type=password] {
           justify-content: center;
        width: 100%;
        margin: 8px 0;
        padding: 12px 20px;
        display: inline-block;
        border: 2px solid green;
        box-sizing: border-box;
    }
 button:hover {
        opacity: 0.7;
    }

 .container {
        justify-content: center;
        padding: 15px;
        background-color: #FFF8DC;
    }
```

**add-student-style.css:**

```
form {
          margin-top: 10px;
}
```

```
label {
	font-size: 16px;
	width: 100px;
	display: block;
	text-align: right;
	margin-right: 10px;
	margin-top: 8px;
	margin-bottom: 8px;
}

input {
	width: 250px;
	border: 1px solid #666;
	border-radius: 5px;
	padding: 4px;
	font-size: 16px;
}

.save {
	font-weight: bold;
	width: 130px;
	padding: 5px 10px;
	margin-top: 30px;
	background: #cccccc;
}

table {
	border-style:none;
	width:50%;
}

tr:nth-child(even) {background: #FFFFFF}
tr:nth-child(odd) {background: #FFFFFF}

tr {
	border-style:none;
	text-align:left;
}
```

**Step - 3:** Configuring the web.xml file for servlet mapping

**web.xml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd" id="WebApp_ID"
version="3.1">
  <display-name>Administrative-Portal</display-name>

  <welcome-file-list>
        <welcome-file>AdminControllerServlet</welcome-file>
        <welcome-file>index.jsp</welcome-file>
        <welcome-file>index.html</welcome-file>
  </welcome-file-list>
</web-app>
```

**Step - 4:** Write a Controller program with admin controller using servlets

```
  import java.io.IOException;
import java.util.List;

import javax.annotation.Resource;
import javax.servlet.RequestDispatcher;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.Cookie;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.sql.DataSource;

import com.simplilearn.models.Student;
import com.simplilearn.models.Subject;
import com.simplilearn.models.Teacher;
import com.simplilearn.models.Class;

/**
 * Servlet implementation class AdminControllerServlet
 */
@WebServlet("/AdminControllerServlet")
public class AdminControllerServlet extends HttpServlet {
```

```
	private static final long serialVersionUID = 1L;

	private DbRetrieve dbRetrieve;

	@Resource(name = "jdbc_database")
	private DataSource datasource;

	@Override
	public void init() throws ServletException {

		super.init();

		// create instance of db util, to pass in conn pool object
		try {
			dbRetrieve = new DbRetrieve(datasource);

		} catch (Exception e) {
			throw new ServletException(e);
		}

	}

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

	@Override
	protected void doPost(HttpServletRequest req, HttpServletResponse resp) throws
ServletException, IOException {

		doGet(req, resp);
	}

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

			// read the "command" parameter
			String command = request.getParameter("command");
```

```
		if (command == null) {
			command = "CLASSES";
		}

		// if no cookeies
		if (!getCookies(request, response) && (!command.equals("LOGIN"))) {

			response.sendRedirect("/Administrative-Portal/login.jsp");
		}

		else {

			// if there is no command, how to handle

			// route the data to the appropriate method
			switch (command) {

			case "STUDENTS":
				studentsList(request, response);
				break;

			case "TEACHERS":
				teachersList(request, response);
				break;

			case "SUBJECTS":
				subjectList(request, response);
				break;

			case "CLASSES":
				classestList(request, response);
				break;

			case "ST_LIST":
				classStudentsList(request, response);
				break;

			case "LOGIN":
				login(request, response);
				break;

			default:
				classestList(request, response);

			}
		}
	} catch (Exception e) {
```

```
                throw new ServletException(e);
            }
            // response.getWriter().append("Served at:
").append(request.getContextPath());
    }

    private void studentsList(HttpServletRequest request, HttpServletResponse
response) throws Exception {
            // get students from db util
            List<Student> students = dbRetrieve.getStudents();

            // add students to the request
            request.setAttribute("STUDENT_LIST", students);

            // send it to the jsp view page
            RequestDispatcher dispatcher = request.getRequestDispatcher("/list-
students.jsp");
            dispatcher.forward(request, response);

    }

    private void teachersList(HttpServletRequest request, HttpServletResponse
response) throws Exception {
            // get students from db util
            List<Teacher> teachers = dbRetrieve.getTeachers();

            // add students to the request
            request.setAttribute("TEACHERS_LIST", teachers);

            // send it to the jSP view page
            RequestDispatcher dispatcher = request.getRequestDispatcher("/teachers-
list.jsp");
            dispatcher.forward(request, response);

    }

    private void subjectList(HttpServletRequest request, HttpServletResponse response)
throws Exception {
            // get subjects from db util
            List<Subject> subjects = dbRetrieve.getSubjects();

            // add subjects to the request
            request.setAttribute("SUBJECTS_LIST", subjects);

            // send it to the jSP view page
            RequestDispatcher dispatcher = request.getRequestDispatcher("/subjects-
list.jsp");
            dispatcher.forward(request, response);
```

```
	}

	private void classestList(HttpServletRequest request, HttpServletResponse
response) throws Exception {
		// get subjects from db util
		List<Class> classes = dbRetrieve.getClasses();

		// add subjects to the request
		request.setAttribute("CLASSES_LIST", classes);

		// send it to the jSP view page
		RequestDispatcher dispatcher = request.getRequestDispatcher("/classes-
list.jsp");
		dispatcher.forward(request, response);

	}

	private void login(HttpServletRequest request, HttpServletResponse response)
throws Exception {
		String username = request.getParameter("username");
		String password = request.getParameter("password");

		if (username.toLowerCase().equals("admin") &&
password.toLowerCase().equals("admin")) {

			Cookie cookie = new Cookie(username, password);

			// Setting the maximum age to 1 day
			cookie.setMaxAge(86400); // 86400 seconds in a day

			// Send the cookie to the client
			response.addCookie(cookie);
			classestList(request, response);
		} else {
			RequestDispatcher dispatcher =
request.getRequestDispatcher("/login.jsp");
			dispatcher.forward(request, response);
		}

	}

	private void classStudentsList(HttpServletRequest request, HttpServletResponse
response) throws Exception {

		int classId = Integer.parseInt(request.getParameter("classId"));
		String section = request.getParameter("section");
		String subject = request.getParameter("subject");
```

```
                // get subjects from db util
                List<Student> students = dbRetrieve.loadClassStudents(classId);

                // add subjects to the request
                request.setAttribute("STUDENTS_LIST", students);
                request.setAttribute("SECTION", section);
                request.setAttribute("SUBJECT", subject);

                // send it to the jSP view page
                RequestDispatcher dispatcher = request.getRequestDispatcher("/class-
students.jsp");
                dispatcher.forward(request, response);

        }

        private boolean getCookies(HttpServletRequest request, HttpServletResponse
response) throws Exception {

                boolean check = false;
                Cookie[] cookies = request.getCookies();
                // Find the cookie of interest in arrays of cookies
                for (Cookie cookie : cookies) {

                        if (cookie.getName().equals("admin") &&
cookie.getValue().equals("admin")) {
                                check = true;
                                break;
                        }

                }


                return check;
        }
}
```

**Step - 5:** Write a program for Database connectivity

```
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;
import java.util.ArrayList;
import java.util.List;
```

```
import javax.sql.DataSource;

import com.simplilearn.models.Student;
import com.simplilearn.models.Subject;
import com.simplilearn.models.Teacher;
import com.simplilearn.models.Class;

public class DbRetrieve {

	private DataSource dataSource;

	public DbRetrieve(DataSource dataSource) {
		this.dataSource = dataSource;
	}

	public List<Student> getStudents() {

		List<Student> students = new ArrayList<>();

		Connection myConn = null;
		Statement myStmt = null;
		ResultSet myRs = null;

		try {

			// get a connection
			myConn = dataSource.getConnection();

			// create sql stmt
			String sql = "SELECT * FROM students";
			myStmt = myConn.createStatement();

			// execute query
			myRs = myStmt.executeQuery(sql);

			// process result
			while (myRs.next()) {

				// retrieve data from result set row
				int id = myRs.getInt("id");
				String firstName = myRs.getString("fname");
				String lastName = myRs.getString("lname");
				int age = myRs.getInt("age");
```

```
                int aclass = myRs.getInt("class");

                // create new student object
                Student tempStudent = new Student(id, firstName,
lastName, age, aclass);

                // add it to the list of students
                students.add(tempStudent);

            }

        } catch (Exception e) {
            // TODO: handle exception
        } finally {
            // close JDBC objects
            close(myConn, myStmt, myRs);
        }
        return students;

    }

    public List<Teacher> getTeachers() {

        List<Teacher> teachers = new ArrayList<>();

        Connection myConn = null;
        Statement myStmt = null;
        ResultSet myRs = null;

        try {

            // get a connection
            myConn = dataSource.getConnection();

            // create sql stmt
            String sql = "SELECT * FROM teachers";
            myStmt = myConn.createStatement();

            // execute query
            myRs = myStmt.executeQuery(sql);

            // process result
            while (myRs.next()) {
```

```
                        // retrieve data from result set row
                        int id = myRs.getInt("id");
                        String firstName = myRs.getString("fname");
                        String lastName = myRs.getString("lname");
                        int age = myRs.getInt("age");

                        // create new student object
                        Teacher temp = new Teacher(id, firstName, lastName,
age);

                        // add it to the list of students
                        teachers.add(temp);

                    }

            } catch (Exception e) {
                    // TODO: handle exception
            } finally {
                    // close JDBC objects
                    close(myConn, myStmt, myRs);
            }
            return teachers;

    }

    public List<Subject> getSubjects() {

            List<Subject> subjects = new ArrayList<>();

            Connection myConn = null;
            Statement myStmt = null;
            ResultSet myRs = null;

            try {

                    // get a connection
                    myConn = dataSource.getConnection();

                    // create sql stmt
                    String sql = "SELECT * FROM subjects";
                    myStmt = myConn.createStatement();

                    // execute query
                    myRs = myStmt.executeQuery(sql);
```

```
                // process result
                while (myRs.next()) {

                        // retrieve data from result set row
                        int id = myRs.getInt("id");
                        String name = myRs.getString("name");
                        String shortcut = myRs.getString("shortcut");

                        // create new student object
                        Subject temp = new Subject(id, name,shortcut);

                        // add it to the list of students
                        subjects.add(temp);

                }

        } catch (Exception e) {
                // TODO: handle exception
        } finally {
                // close JDBC objects
                close(myConn, myStmt, myRs);
        }
        return subjects;

}

public List<Class> getClasses() {

        List<Class> classes = new ArrayList<>();

        Connection myConn = null;
        Statement myStmt = null;
        ResultSet myRs = null;

        try {

                // get a connection
                myConn = dataSource.getConnection();

                // create sql stmt
                String sql = "SELECT * FROM classes";
                myStmt = myConn.createStatement();
```

```
                        // execute query
                        myRs = myStmt.executeQuery(sql);

                        // process result
                        while (myRs.next()) {

                                // retrieve data from result set row
                                int id = myRs.getInt("id");
                                int section = myRs.getInt("section");
                                int subject = myRs.getInt("subject");
                                int teacher = myRs.getInt("teacher");
                                String time = myRs.getString("time");

                                Teacher tempTeacher = loadTeacher(teacher);
                                Subject tempSubject = loadSubject(subject);

                                String teacher_name = tempTeacher.getFname() + " " +
tempTeacher.getLname();

                                // create new student object
                                Class temp = new Class(id, section, teacher_name,
tempSubject.getName(), time);

                                // add it to the list of students
                                classes.add(temp);

                        }

                } catch (Exception e) {
                        // TODO: handle exception
                } finally {
                        // close JDBC objects
                        close(myConn, myStmt, myRs);
                }
                return classes;

        }

        public Teacher loadTeacher(int teacherId) {

                Teacher theTeacher = null;

                Connection myConn = null;
                Statement myStmt = null;
```

```
		ResultSet myRs = null;

		try {

			// get a connection
			myConn = dataSource.getConnection();

			// create sql stmt
			String sql = "SELECT * FROM teachers WHERE id = " +
teacherId;
			myStmt = myConn.createStatement();

			// execute query
			myRs = myStmt.executeQuery(sql);

			// process result
			while (myRs.next()) {

				// retrieve data from result set row
				int id = myRs.getInt("id");
				String fname = myRs.getString("fname");
				String lname = myRs.getString("lname");
				int age = myRs.getInt("age");
				theTeacher = new Teacher(id, fname, lname, age);

			}

		} catch (Exception e) {
			// TODO: handle exception
		} finally {
			// close JDBC objects
			close(myConn, myStmt, myRs);
		}
		return theTeacher;

	}

	public Subject loadSubject(int subjectId) {

		Subject theSubject = null;

		Connection myConn = null;
		Statement myStmt = null;
		ResultSet myRs = null;
```

```
		try {

			// get a connection
			myConn = dataSource.getConnection();

			// create sql stmt
			String sql = "SELECT * FROM subjects WHERE id = " +
subjectId;
			myStmt = myConn.createStatement();

			// execute query
			myRs = myStmt.executeQuery(sql);

			// process result
			while (myRs.next()) {

				// retrieve data from result set row
				int id = myRs.getInt("id");
				String name = myRs.getString("name");
				String shortcut = myRs.getString("shortcut");

				theSubject = new Subject(id, name,shortcut);

			}

		} catch (Exception e) {
			// TODO: handle exception
		} finally {
			// close JDBC objects
			close(myConn, myStmt, myRs);
		}
		return theSubject;

	}

	public Class loadClass(int classId) {

		Class theClass = null;

		Connection myConn = null;
		Statement myStmt = null;
		ResultSet myRs = null;
```

```
		try {

			// get a connection
			myConn = dataSource.getConnection();

			// create sql stmt
			String sql = "SELECT * FROM clasess WHERE id = " + classId;
			myStmt = myConn.createStatement();

			// execute query
			myRs = myStmt.executeQuery(sql);

			// process result
			while (myRs.next()) {

				// retrieve data from result set row
				int id = myRs.getInt("id");
				int section = myRs.getInt("section");
				int subject = myRs.getInt("subject");
				int teacher = myRs.getInt("teacher");
				String time = myRs.getString("time");

				Teacher tempTeacher = loadTeacher(teacher);
				Subject tempSubject = loadSubject(subject);

				String teacher_name = tempTeacher.getFname() + " " +
tempTeacher.getLname();

			}

		} catch (Exception e) {
			// TODO: handle exception
		} finally {
			// close JDBC objects
			close(myConn, myStmt, myRs);
		}
		return theClass;

	}

	public List<Student> loadClassStudents(int classId) {

		List<Student> students = new ArrayList<>();
```

```
		Connection myConn = null;
		Statement myStmt = null;
		ResultSet myRs = null;

		try {

			// get a connection
			myConn = dataSource.getConnection();

			// create sql stmt
			String sql = "SELECT * FROM students WHERE class = " +
classId;
			myStmt = myConn.createStatement();

			// execute query
			myRs = myStmt.executeQuery(sql);

			// process result
			while (myRs.next()) {

				// retrieve data from result set row
				int id = myRs.getInt("id");
				String firstName = myRs.getString("fname");
				String lastName = myRs.getString("lname");
				int age = myRs.getInt("age");
				int aclass = myRs.getInt("class");

				// create new student object
				Student tempStudent = new Student(id, firstName,
lastName, age, aclass);
				students.add(tempStudent);

			}

		} catch (Exception e) {
			// TODO: handle exception
		} finally {
			// close JDBC objects
			close(myConn, myStmt, myRs);
		}
		return students;

	}
```

```
	private void close(Connection myConn, Statement myStmt, ResultSet myRs) {

		try {
			if (myRs != null) {
				myRs.close();
			}
			if (myStmt != null) {
				myStmt.close();
			}
			if (myConn != null) {
				myConn.close();
			}

		} catch (Exception e) {
			e.printStackTrace();
		}

	}
}
```

**Step - 6:** Write Programs for the model class

```
public class Class {

	private int id;
	private int section;
	private String teacher;
	private String subject;
	private String time;



	public Class(int id, int section, String teacher, String subject, String time) {
		super();
		this.id = id;
		this.section = section;
		this.teacher = teacher;
		this.subject = subject;
		this.time = time;
	}
```

```
	public int getId() {
		return id;
	}
	public void setId(int id) {
		this.id = id;
	}
	public int getSection() {
		return section;
	}
	public void setSection(int section) {
		this.section = section;
	}
	public String getTeacher() {
		return teacher;
	}
	public void setTeacher(String teacher) {
		this.teacher = teacher;
	}
	public String getSubject() {
		return subject;
	}
	public void setSubject(String subject) {
		this.subject = subject;
	}
	public String getTime() {
		return time;
	}
	public void setTime(String time) {
		this.time = time;
	}
}

public class Student {

	private int id;
	private String fname;
	private String lname;
	private int age;
	private int aclass;
```

```
	public Student(int id, String fname, String lname, int age, int aclass) {
		super();
		this.id = id;
		this.fname = fname;
		this.lname = lname;
		this.age = age;
		this.aclass = aclass;
	}


	public int getId() {
		return id;
	}
	public void setId(int id) {
		this.id = id;
	}
	public String getFname() {
		return fname;
	}
	public void setFname(String fname) {
		this.fname = fname;
	}
	public String getLname() {
		return lname;
	}
	public void setLname(String lname) {
		this.lname = lname;
	}
	public int getAge() {
		return age;
	}
	public void setAge(int age) {
		this.age = age;
	}
	public int getAclass() {
		return aclass;
	}
	public void setAclass(int aclass) {
		this.aclass = aclass;
	}
	@Override
	public String toString() {
		return "Student [id=" + id + ", fname=" + fname + ", lname=" + lname +
", age=" + age + ", aclass=" + aclass
```

```
                                        + "]";
        }
}

public class Subject {

        private int id;
        private String name;
        private String shortcut;

        public Subject(int id, String name, String shortcut ) {
                super();
                this.id = id;
                this.name = name;
                this.shortcut = shortcut;
        }

        public int getId() {
                return id;
        }

        public void setId(int id) {
                this.id = id;
        }

        public String getShortcut() {
                return shortcut;
        }

        public void setShortcut(String shortcut) {
                this.shortcut = shortcut;
        }

        public String getName() {
                return name;
        }

        public void setName(String name) {
                this.name = name;
        }
}

public class Teacher {
```

```
private int id;
private String fname;
private String lname;
private int age;

public Teacher(int id, String fname, String lname, int age) {
	super();
	this.id = id;
	this.fname = fname;
	this.lname = lname;
	this.age = age;
}

public int getId() {
	return id;
}

public void setId(int id) {
	this.id = id;
}

public String getFname() {
	return fname;
}

public void setFname(String fname) {
	this.fname = fname;
}

public String getLname() {
	return lname;
}

public void setLname(String lname) {
	this.lname = lname;
}

public int getAge() {
	return age;
}

public void setAge(int age) {
	this.age = age;
}
```

}

**Step - 7:** Write a Program for Test Servlet

```
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;

import javax.annotation.Resource;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.sql.DataSource;

/**
 * Servlet implementation class TestServlet
 */
@WebServlet("/TestServlet")
public class TestServlet extends HttpServlet {
	private static final long serialVersionUID = 1L;

	//Define datasource/connection pool for reference

	@Resource(name="jdbc_database")
	private DataSource dataSource;




	/**
	 * @see HttpServlet#doGet(HttpServletRequest request,
HttpServletResponse response)
	 */
	protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {


		// Set the printwriter
```

```
                PrintWriter out = response.getWriter();
                response.setContentType("text/plain");

                // establish connection to the DB
                Connection myConn = null;
                Statement myStmt = null;
                ResultSet myRs = null;

                try {

                        myConn = dataSource.getConnection();
                //create a sql statement
                String sql = "select * from students";
                myStmt = myConn.createStatement();


                //execute the sql statement
                myRs = myStmt.executeQuery(sql);

                //process the resultset
                while(myRs.next()) {
                        String fname = myRs.getString("fname");
                        out.println(fname);

                }

                }
                catch(Exception e) {
                        e.printStackTrace();
                }

        }
}
```

**Step - 8:** Configure MySQL Database used in the application

```
<Context>
  <Resource name="jdbc_database"
            auth="Container" type="javax.sql.DataSource"
            maxActive="20" maxIdle="5" maxWait="10000"
            username="root" password="Dinesh@123"
```

```
        driverClassName="com.mysql.cj.jdbc.Driver"
        url="jdbc:mysql://localhost:3306/learnersPortal&useSSL=false"/>
</Context>
```

**Step - 9:** Pushing the code to GitHub repository

- Open your command prompt and navigate to the folder where you have created your files.
    - **cd <folder path>**
- Initialize repository using the following command:
    - **git init**
- Add all the files to your git repository using the following command:
    - **git add .**
- Commit the changes using the following command:
    - **git commit .  -m  <commit message>**
- Push the files to the folder you initially created using the following command:
    - **git push -u origin master**

## Unique Selling Points of the Application:

- ✓ The application is designed to Keep track on learners and teachers who are willing to keep a note of sessions in daily classes for Academies and Institutes.
- ✓ The application has functionalities of both user view and admin view where the teacher is the admin can perform multiple operations.
- ✓ The application will display the list of all students, Teachers and the subjects that are being held in the time frame or period.

- ✓ The application is designed with modularity in mind. Even if one wants to update the path, they can change it through the source code. Application has been developed keeping in mind that there should be very less “hardcoding” of data.

## Conclusions:

Further enhancements to the application can be made which may include:

- Improved login Screen and some more validation check can be added.
- After Login to the Portal need to have some security routing or Routing params can be implemented to restrict the users from admin.
- The list view can be better way like instead of having all in one can design separate pages or components of each of them and can integrate all.
- Rich UI over all the application and the side nav can also be improved by having only few options.