PROBLEM STATEMENT:

Develop a platform for conducting an online quiz for at least five subjects, containing minimum ten questions each with multiple choice options, where a particular student can signup, login, attempt the quiz and can view his/her result.

TOOLS USED:

❖ Eclipse IDE for Enterprise Java Developers.
❖ Apache Tomcat 9.0 server.
❖ MySQL Database.

OVERVIEW:

Front End: Under WebContent folder the jsp pages and corresponding css files constitute the front end of project.

1. index.jsp – the landing page of website.
2. login.jsp – ask for users' credentials.
3. sigup.jsp – ask for a unique username along with a password.
4. dashboard.jsp – display the list of subjects. User can take the quiz by clicking on start button corresponding to the subject. Already finished subject shows a message "Already Done" corresponding to it.
5. instruction.jsp – contain necessary information for taking up the quiz.
6. quesPage.jsp – display one question at a time, with a running timer at the top.
7. result.jsp – display the result of the corresponding quiz.
8. resultDash.jsp – the combo box here includes the list of subjects finished, whose score is present in the database.

Back End: Under the src/default package contains the servlet files.

1. DatabaseConnection.java – a simple java class which has the method initializeDatabase() with a return type of protected static Connection object of java.sql.Connection class. It develops a connection to the database.
2. PasswordHandler.java – a simple java class which actually takes plain text and hash it. During login the method generateHashPassword(String password) returns the hashed password and during signup the method validatePassword(String originalPassword, String storedPassword) returns boolean value depending upon validation.
3. SignupServlet.java –
   ✓ Check if the new requested username already exists in the table or not.
   ✓ If it's the new username then insert it into the login table.
4. LoginServlet.java –
   ✓ Checks if username given by the user on login page exists on in the login table or not.
   ✓ If the name exists then it matches the password.
   ✓ If password is matched the a session of the user is stablished using the HttpSession class.
5. DashboardServlet.java –
   ✓ Its fetches from result table which subjects have been already attempt by the user.
   ✓ The subject already done doesn't include any start button on DashBoard.jsp page.
   ✓ The subject to appear are displayed with their durations and a start button to start the quiz.

6. SubjectServlet.java –
   ✓ It gets the response about the subject selected by user on the dashboard for the quiz.
   ✓ It fetches the questions and options from the table corresponding to the subject selected.
   ✓ It creates a session and send these questions and answer to quesPage.jsp for the quiz.
7. ResultServlet.java –
   ✓ On completing the quiz, it fetch the response about marks, total questions and total question attempt by the the user.
   ✓ It the insert these values to the result table corresponding to the particular subject and username.
8. ShowResults.java –
   ✓ From the DashBoard when user directly wants to see the results of already done quiz, then ShowResults.java servlet fetches the information about the already done quiz from the result database.
   ✓ It set the flag=1 corresponding to already done quiz show that it can be included in the combo box of resultDash.jsp.
9. ResultServletB.java –
   ✓ It get response about the selected subject from the combo box and fetch the corresponding subject result from the result table.
10. MySql Database –
    Database includes the following relations:
    ✓ Login
    ✓ Result
    ✓ ACA
    ✓ AdvJava
    ✓ Iot
    ✓ Cg
    ✓ Os
    The schema of the relations:
    ✓ Login

```
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| username  | varchar(50) | YES  |     | NULL    |       |
| password  | char(161)   | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
```

    ✓ Result

```
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| username       | varchar(20) | NO   | PRI | NULL    |       |
| subject        | varchar(20) | NO   | PRI | NULL    |       |
| total_question | int(2)      | YES  |     | NULL    |       |
| total_attempt  | int(2)      | YES  |     | NULL    |       |
| mark           | int(2)      | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
```

- ✓ ACA, AdvJava, Iot, Cg, Os

```
+----------+---------------+------+-----+---------+-------+
| Field    | Type          | Null | Key | Default | Extra |
+----------+---------------+------+-----+---------+-------+
| qid      | int(2)        | NO   | PRI | NULL    |       |
| question | varchar(800)  | YES  |     | NULL    |       |
| option1  | varchar(90)   | YES  |     | NULL    |       |
| option2  | varchar(90)   | YES  |     | NULL    |       |
| option3  | varchar(90)   | YES  |     | NULL    |       |
| option4  | varchar(90)   | YES  |     | NULL    |       |
| answer   | int(2)        | YES  |     | NULL    |       |
+----------+---------------+------+-----+---------+-------+
```