Here’s a **step-by-step process** to create a **Quiz Web Application** using **Eclipse IDE for Enterprise Java**, **Apache Tomcat**, **JSP/Servlets**, and **JDBC (MySQL)**:

**🔧 Tools Required**

* Eclipse IDE for Enterprise Java Developers
* Apache Tomcat (v7/8/9)
* MySQL (or any DB)
* MySQL Connector JAR (JDBC Driver)

**📁 Project Structure**

pgsql

CopyEdit

QuizApp/

│

├── src/

│ └── com.quizapp.\*

│ ├── LoginServlet.java

│ ├── QuizServlet.java (optional) with out jsp you can write it

│ └── ResultServlet.java

│

├── WebContent/

│ ├── index.jsp

│ ├── login.jsp

│ ├── quiz.jsp

│ ├── result.jsp

│ └── WEB-INF/

│ └── web.xml

**✅ Step-by-Step Process**

**1. Setup Tomcat in Eclipse**

1. Open Eclipse → Go to Window → Preferences.
2. Expand Server → Runtime Environments → Add.
3. Select Apache Tomcat v9.0 → Next → Browse to Tomcat folder → Finish.

**2. Create Dynamic Web Project**

1. File → New → Dynamic Web Project → Name: QuizApp
2. Target Runtime: Apache Tomcat
3. Configuration: Dynamic Web Module version 3.0+ → Finish

**3. Create Required Packages and Classes**

* Right-click src → New → Package → Name: com.quizapp
* Inside the package, create:
  + LoginServlet.java
  + QuizServlet.java
  + ResultServlet.java

-----------------------------------------if you not use annotation servlet then you can use it-----------------------

**4. Setup web.xml (Deployment Descriptor)**

<web-app>

<servlet>

<servlet-name>LoginServlet</servlet-name>

<servlet-class>com.quizapp.LoginServlet</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>LoginServlet</servlet-name>

<url-pattern>/login</url-pattern>

</servlet-mapping>

<servlet>

<servlet-name>QuizServlet</servlet-name>

<servlet-class>com.quizapp.QuizServlet</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>QuizServlet</servlet-name>

<url-pattern>/quiz</url-pattern>

</servlet-mapping>

<servlet>

<servlet-name>ResultServlet</servlet-name>

<servlet-class>com.quizapp.ResultServlet</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>ResultServlet</servlet-name>

<url-pattern>/result</url-pattern>

</servlet-mapping>

</web-app>

**Web.xml**

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

<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xmlns="http://java.sun.com/xml/ns/javaee"

xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app\_3\_0.xsd"

id="WebApp\_ID" version="3.0">

<display-name>QuizApp</display-name>

<welcome-file-list>

<welcome-file>login.jsp</welcome-file>

<welcome-file>index.html</welcome-file>

<welcome-file>index.jsp</welcome-file>

<welcome-file>index.htm</welcome-file>

<welcome-file>default.html</welcome-file>

<welcome-file>default.jsp</welcome-file>

<welcome-file>default.htm</welcome-file>

</welcome-file-list>

</web-app>

**Complete Quiz App Database Schema + Code**

**✅ 1. MySQL Schema SQL File (quizdb.sql)**

-- 1. Create the database

CREATE DATABASE IF NOT EXISTS quizdb;

USE quizdb;

-- 2. Create users table

CREATE TABLE IF NOT EXISTS users (

id INT AUTO\_INCREMENT PRIMARY KEY,

username VARCHAR(100) NOT NULL UNIQUE

);

-- 3. Create questions table

CREATE TABLE IF NOT EXISTS questions (

id INT AUTO\_INCREMENT PRIMARY KEY,

question TEXT NOT NULL,

option\_a VARCHAR(100) NOT NULL,

option\_b VARCHAR(100) NOT NULL,

option\_c VARCHAR(100) NOT NULL,

option\_d VARCHAR(100) NOT NULL,

correct\_option CHAR(1) NOT NULL -- 'A', 'B', 'C', 'D'

* 4 Results Table (with foreign key to users.id)

CREATE TABLE IF NOT EXISTS results (

id INT AUTO\_INCREMENT PRIMARY KEY,

user\_id INT NOT NULL,

score INT NOT NULL,

FOREIGN KEY (user\_id) REFERENCES users(id)

ON DELETE CASCADE

ON UPDATE CASCADE

);

-- 5. Insert sample users (optional)

INSERT IGNORE INTO users (username) VALUES

('john\_doe'),

('mayuri\_k'),

('guest\_user');

-- 6. Insert questions

INSERT INTO questions (question, option\_a, option\_b, option\_c, option\_d, correct\_option) VALUES

('What is Java?', 'Database', 'Operating System', 'Programming Language', 'Browser', 'C'),

('Which company developed Java?', 'Microsoft', 'Sun Microsystems', 'Google', 'Apple', 'B'),

('What does JVM stand for?', 'Java Virtual Machine', 'Java Version Manager', 'Just VM', 'Java Vendor Module', 'A'),

('Which keyword is used to inherit a class in Java?', 'this', 'final', 'extends', 'import', 'C'),

('Which method is the entry point for any Java application?', 'start()', 'main()', 'run()', 'init()', 'B'),

('Which of these is not a Java keyword?', 'static', 'Integer', 'void', 'new', 'B'),

('Which collection class allows you to grow or shrink its size?', 'ArrayList', 'Array', 'HashMap', 'String', 'A'),

('Which symbol is used to declare a variable in Java?', '$', '@', '#', 'None of the above', 'D'),

('Which statement is true about constructors?', 'They can return values', 'They have a return type', 'They are invoked automatically', 'They are static', 'C'),

('Which of the following is a Java loop structure?', 'while', 'foreach', 'do-while', 'All of the above', 'D');

LoginServlet.java

**package** com.quizapp;

**import** java.io.IOException;

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.PreparedStatement;

**import** java.sql.ResultSet;

**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.servlet.http.HttpSession;

@WebServlet("/login")

**public** **class** LoginServlet **extends** HttpServlet {

**protected** **void** doPost(HttpServletRequest request, HttpServletResponse response)

**throws** ServletException, IOException {

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

HttpSession session = request.getSession();

session.setAttribute("username", username);

**int** userId = -1;

**try** {

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

Connection conn = DriverManager.*getConnection*("jdbc:mysql://localhost:3306/quizdb", "root", "root");

PreparedStatement ps = conn.prepareStatement("INSERT IGNORE INTO users(username) VALUES (?)");

ps.setString(1, username);

ps.executeUpdate();

// Now retrieve the ID

ps = conn.prepareStatement("SELECT id FROM users WHERE username = ?");

ps.setString(1, username);

ResultSet rs = ps.executeQuery();

**if** (rs.next()) {

userId = rs.getInt("id");

session.setAttribute("userId", userId);

}

conn.close();

} **catch** (Exception e) {

e.printStackTrace();

}

response.sendRedirect("quiz.jsp");

}

}

ResultServlet.java

**package** com.quizapp;

**import** java.io.IOException;

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.PreparedStatement;

**import** java.sql.ResultSet;

**import** java.sql.Statement;

**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.servlet.http.HttpSession;

@WebServlet("/result")

**public** **class** ResultServlet **extends** HttpServlet {

**protected** **void** doPost(HttpServletRequest request, HttpServletResponse response)

**throws** ServletException, IOException {

HttpSession session = request.getSession();

Integer userId = (Integer) session.getAttribute("userId");

**int** score = 0;

**try** {

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

Connection conn = DriverManager.*getConnection*("jdbc:mysql://localhost:3306/quizdb", "root", "root");

Statement stmt = conn.createStatement();

ResultSet rs = stmt.executeQuery("SELECT id, correct\_option FROM questions");

**while** (rs.next()) {

**int** qid = rs.getInt("id");

String correct = rs.getString("correct\_option");

String userAnswer = request.getParameter("q" + qid);

**if** (correct.equalsIgnoreCase(userAnswer)) {

score++;

}

}

// Save result using user\_id

PreparedStatement ps = conn.prepareStatement("INSERT INTO results(user\_id, score) VALUES (?, ?)");

ps.setInt(1, userId);

ps.setInt(2, score);

ps.executeUpdate();

conn.close();

} **catch** (Exception e) {

e.printStackTrace();

}

request.setAttribute("result", "Your Score: " + score);

request.getRequestDispatcher("result.jsp").forward(request, response);

}

}

Index.jsp

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Insert title here</title>

</head>

<body>

<jsp:forward page=*"login.jsp"*/>

</body>

</html>

login.jsp

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Insert title here</title>

</head>

<body>

<form action=*"login"* method=*"post"*>

Username: <input type=*"text"* name=*"username"*/><br/>

<input type=*"submit"* value=*"Start Quiz"*/>

</form>

</body>

</html>

quiz.jsp

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Insert title here</title>

</head>

<body>

<%@ page import=*"java.sql.\*"*%>

<%

Connection conn = DriverManager.getConnection("jdbc:mysql://localhost:3306/quizdb", "root", "root");

Statement stmt = conn.createStatement();

ResultSet rs = stmt.executeQuery("SELECT \* FROM questions");

%>

<form action=*"result"* method=*"post"*>

<%

**int** qno = 1;

**while** (rs.next()) {

%>

<p>

<b>Q<%=qno++%>: <%=rs.getString("question")%></b>

</p>

<input type=*"radio"* name=*"q*<%=rs.getInt("id")%>*"* value=*"A"*>

<%=rs.getString("option\_a")%><br /> <input type=*"radio"*

name=*"q*<%=rs.getInt("id")%>*"* value=*"B"*>

<%=rs.getString("option\_b")%><br /> <input type=*"radio"*

name=*"q*<%=rs.getInt("id")%>*"* value=*"C"*>

<%=rs.getString("option\_c")%><br /> <input type=*"radio"*

name=*"q*<%=rs.getInt("id")%>*"* value=*"D"*>

<%=rs.getString("option\_d")%><br />

<hr>

<%

}

%>

<input type=*"submit"* value=*"Submit Quiz"*>

</form>

</body>

</html>

result.jsp

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Insert title here</title>

</head>

<body>

<%

String result = (String) request.getAttribute("result");

%>

<h2><%= result %></h2>

</body>

</html>

**7. Add MySQL Connectivity (Optional for DB storage)**

* Download MySQL Connector JAR
* Right-click Project → Build Path → Configure Build Path → Libraries → Add External JARs

**8. Run on Tomcat Server**

1. Right-click QuizApp → Run As → Run on Server
2. Choose Tomcat → Finish