

UCS1611- Internet Programming Lab

Assignment 4 - Online Examination with DB Connection

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AIM:

To design and implement a three-tier application with Servlet and Database connectivity (Online Examination with DB Connection).

DESIGN:

DATABASE:

The name of the database used to store the tables is online_exam database. Student's info including student_id, name, login id , password and status(exam taken or not taken) are included in students table. Questions, options and answers are included in question_bank table.

ONLINE_EXAM DATABASE

Table: STUDENTS

| FIELD | TYPE |
|--------------|-------------|
| student_id | tinyint |
| name | varchar(50) |
| login_id | varchar(50) |
| password | varchar(50) |
| marks | tinyint |

| | |
|--------|---------|
| status | tinyint |
|--------|---------|

Table: QUESTION_BANK

| FIELD | TYPE |
|-------------|--------------|
| question_id | tinyint |
| question | varchar(100) |
| option1 | varchar(100) |
| option2 | varchar(50) |
| option3 | varchar(50) |
| option4 | varchar(50) |
| answer | varchar(50) |

| MODEL | VIEW | CONTROLLER |
|-----------------|---------------------------|---------------|
| ExamExpert.java | View provided by ExamServ | ExamServ.java |
| | View provided by ExamQues | ExamQues.java |
| | View provide by ExamRes | ExamRes.java |

index.html: This contains the form that takes the login details from the user.

(CONTROLLER) The input from index.html is obtained through post method to this controller. This servlet will call checkUser() in ExamExpert.java which returns id or null. If null is returned "invalid login" is printed in index.html with all the existing input cleared.

(MODEL) checkUser() in ExamExpert.java will return id of the student if the input matches the details in the database else returns null.

(CONTROLLER) Once the user is logged in. Questions will be displayed in ExamQues servlet. This will use getQuestions() of model to display questions one by one to the user. Subsequent questions will be displayed after clicking the submit button. Once the submit button is clicked this servlet check for the answer and update the marks. After all the answers are submitted, ExamRes servlet is called by this servlet to display the result.

(CONTROLLER) This controller receives marks and login id from ExamQues. This servlet uses getName() of model to get the name based on the student_id and display the marks to the user. This servlet also updates the mark to the database and change the status to 1.

(MODEL) getName() will get the name from the database based on the student_id. updateMark() updates the mark of the student and changes the status to 1.

SEQUENCE:

1. User enters username and password through the form provided in index.html and on submit it will be sent to ExamServ servlet.
2. ExamServ validates the user's input by checkUser() method of the model. According to the output, the user either enters question page or pushed back to index.html with appropriate error message.
3. checkUser() creates connection to the database online_exam and retrieve the student_id that matches the login_id and password entered by the user. If no rows match. null is returned.
4. ExamServ calls the ExamQues servlet if the entry is found in the database identified by the student_id returned from checkUser(). If null is returned, error message is displayed in the index.html along with form elements.
5. ExamQues servlet get the questions from the question_bank table with the help of getQuestions() method of the model ExamExpert.
6. ExamQues displays the question one by one and a submit button is displayed. When the submit button is clicked the answer is validated by ExamQues and marks is incremented accordingly.
7. After submitting the last question, answer is validated and marks and student is sent to ExamRes.

8. ExamRes displays the marks and the name of the student.
9. ExamRes calls updateMark() function of the model ExamExpert to update the marks and status in the database.
10. updateMark() select the row by student_id and updates the mark and status.

SESSION TRACKING:

- Username and password from the user is added to the request object and sent to ExamServ.
- ExamServ will validate the input and adds student_id to the response object and forward to ExamQues.
- ExamQues will obtain all the answers from the user and update the marks.
- Finally marks along with total is added to the response object and sent to ExamRes.
- ExamRes update the result by the use of student_id and marks from the object.