Documentation

Project Description:

Create an Online Quiz Application in Java that allows users to take quizzes on various topics. The application should support multiple-choice questions, track user progress, and provide feedback on quiz performance.

Design a user-friendly interface using JavaFX, Swing or any other language as per your choice for a smooth user experience.

Ensure clarity and consistency in the layout and navigation.

Use a database (e.g., SQLite, MySQL, etc.) to store user accounts, quizzes, questions, and quiz

results. Implement CRUD operations using JDBC for database interaction.

Handle exceptions gracefully and provide informative error messages to users. Validate user input to prevent errors and ensure data integrity.
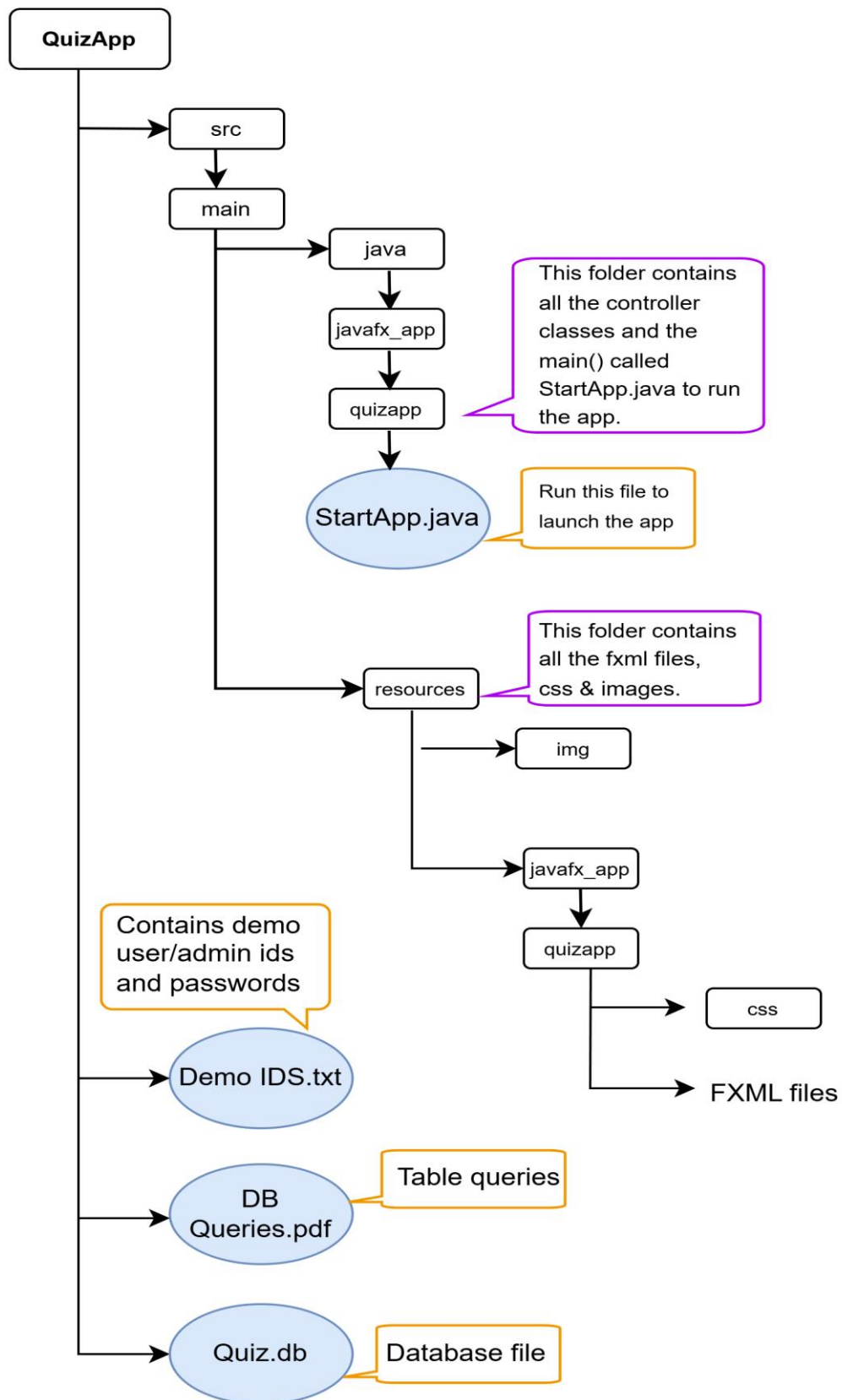
Implement password hashing and salting to securely store user passwords.

Implement a leaderboard to display top scorers for each quiz and rank users based on their total scores. Consider adding features such as timer-based quizzes.

Technology Used

- Frontend: JavaFX (FXML), CSS

- Backend: Java (JDK SE Version 24 64bit)

- Database: SQLite (DB Browser)

- Build Tool: Maven

- IDE: IntelliJ IDEA community edition 2024.3.5

- Libraries/Frameworks:

    - JDBC (for database connection)

    - Control FX (For custom notification)

    - Jbcrypt (For password hashing and salting)

    - JavaFX Controls & Layouts

- System Used: OS: Windows 10 Pro, RAM: 8GB, Processor: i5 2400 (2nd Gen)

Folder Structure (only necessary paths shown)

QuizApp

- src
  - main
    - java
      - javafx_app
        - quizapp

          > This folder contains all the controller classes and the main() called StartApp.java to run the app.

          - **StartApp.java**

            > Run this file to launch the app

    - resources

      > This folder contains all the fxml files, css & images.

      - img
      - javafx_app
        - quizapp
          - css
          - FXML files

- **Demo IDS.txt**

  > Contains demo user/admin ids and passwords

- **DB Queries.pdf**

  > Table queries

- **Quiz.db**

  > Database file

Launch the App

To launch the app, extract the QuizApp.zip file and open it with intellij idea IDE then go to:

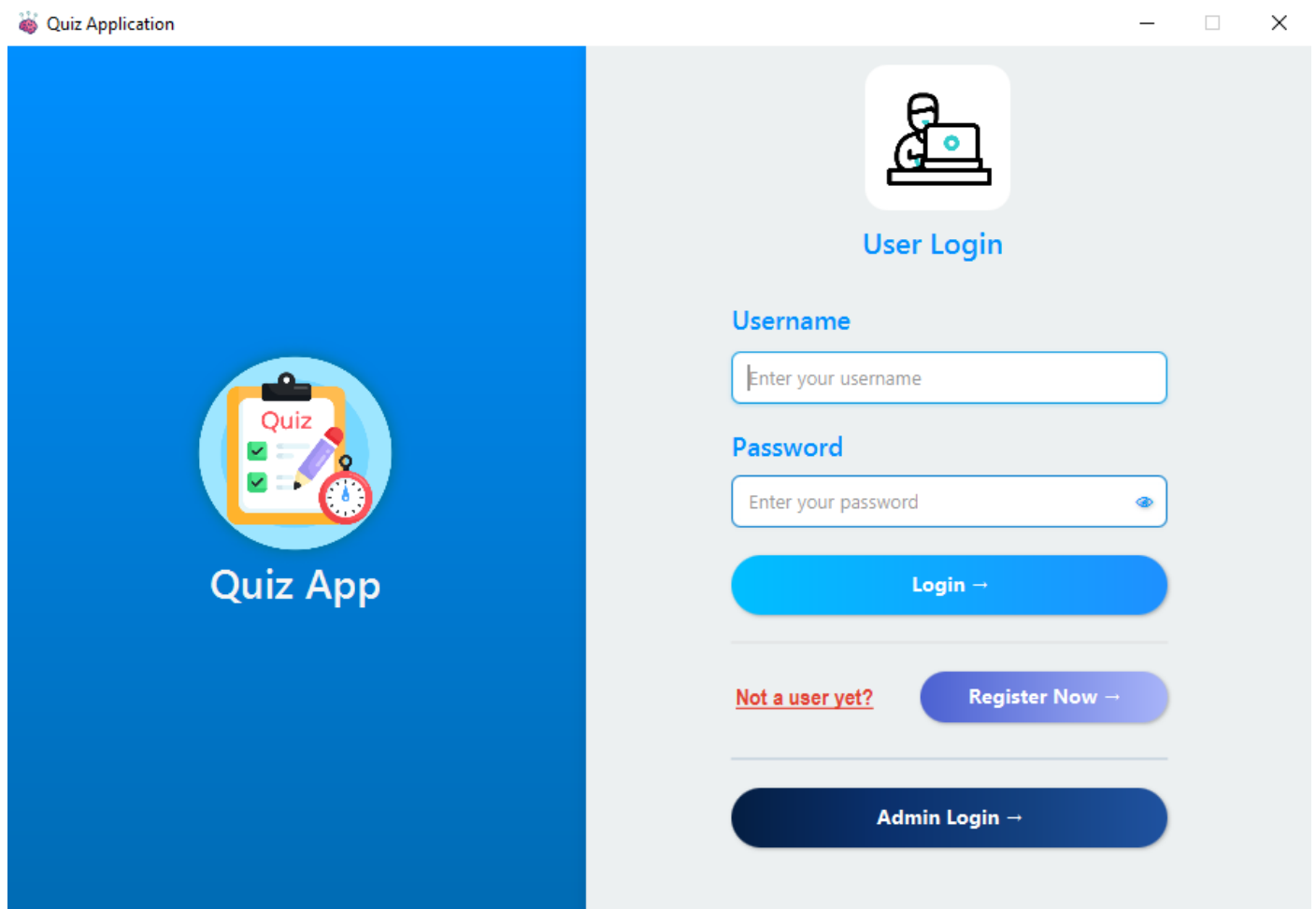QuizApp \ src \ main \ java \ javafx_app \ quizapp \StartApp.java

and run this "StartApp.java" file.

Screenshots and Guide

User Login screen: User need to put his/her credentials and click 'Login' to login.

User can view his/her password by clicking eye button on password field.

If user does not have an account, he/she can click on 'Reister Now' to create an account.

<u>User Register Screen:</u> When user clicks 'Register Now' this window opens up, here user have to put his/her details, give a valid unique mail id and create password. Passwords were encrypted using hashing and salting and ten saved to the database.
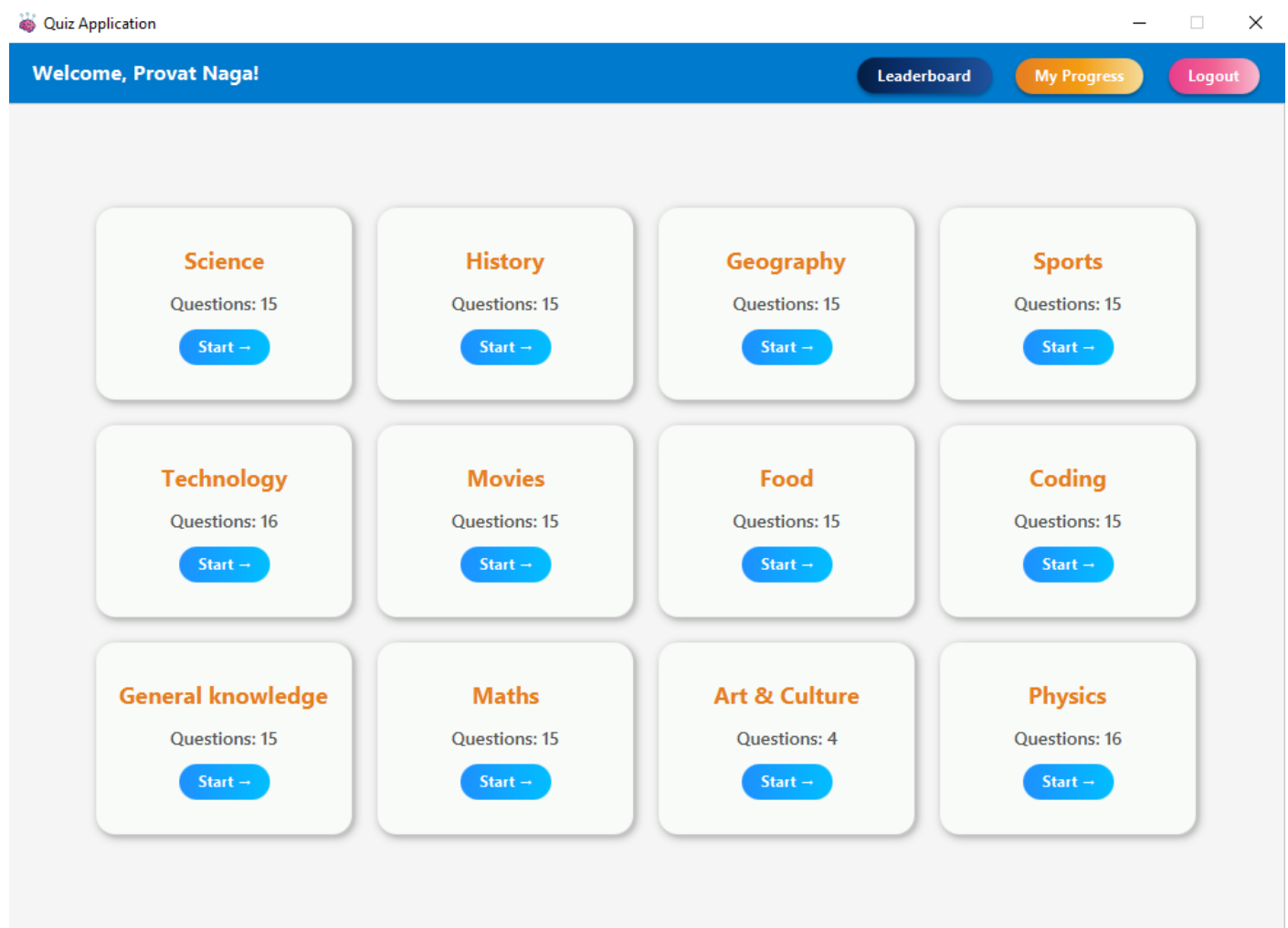
<u>User Panel:</u> After successful login a user panel opens with greetings. Here different quizzes are valuable on different topics to choose from. User can choose any topic and click on 'start' to start taking quiz.

Additionally, three buttons on top right;

- 'Leaderboard' button to see the other users score based on overall score or quiz specific.
- 'My progress' button to view users past performance details.
- 'Logout' button, self-explanatory.

When you click start on any card in user panel this window will open. Here you take the quiz. There is a timer at the top, if it runs out quiz is auto submitted or you can manually submit the quiz by chickling 'finish quiz' button which will appear when you will reach at the last question (shown in next screenshot). And those two buttons, next and previous are for navigating through quizzes and quit button is for to quit and return to user panel nothing will be saved.

On right side, its progress tracker box, you can easily jump on any question by clicking on the question number. It gives instant feedback to your answer:

- If question is not visited then it is cream wite colour.
- If visited but not answered then blue.
- If visited and answered right then green.
- And finally, if visited and answered wrong then pink.

So, at last question the finish button appears.

Quiz Result: After auto submit/manually submit this screen appears showing end result i.e. score, no. of right answers, no. of wrong answers, no. of not attempted and time taken.

My progress: When you click on 'My progress' button in user panel this window will open. Here, a use can view his/her pass quizzes they have attempted. It initially shows score, time taken, last attempt date/time, no. of attempts. There is a 'details' button which on clicked will display the questions and their answer given by the user sorted by the latest attempts (shown in next screenshot).

You can click hide button to hide the view.

Quiz Application

Provat Naga's Progress !

← Back   ← Logout

Movies	Sports	General knowledge
Score: 86%	Score: 0%	Score: 80%
Time: 04:28	Time: 00:10	Time: 03:11
Last Attempt: 20/04/25 11:32 am	Last Attempt: 20/04/25 10:43 am	Last Attempt: 20/04/25 09:30 am

↑ Drag up for more

Sports

Hide ↓

▶ Attempt on 20/04/25 10:43 am (Attempt #2)

▼ Attempt on 19/04/25 06:51 pm (Attempt #1)

Q: Which country has won the most FIFA World Cup titles?
Your Answer: Italy
→ Wrong

Q: In which sport is the Ryder Cup contested?
Your Answer: Tennis
→ Wrong

Q: Who was the first Indian to win an individual Olympic gold medal?
Your Answer: Milkha Singh
→ Wrong

Q: What is the national sport of Japan?
Your Answer: Sumo Wrestling
→ Correct

Quiz Application

Provat Naga's Progress !

← Back   ← Logout

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Last Attempt: 20/04/25 11:32 am	Last Attempt: 20/04/25 10:43 am	Last Attempt: 20/04/25 09:30 am

↑ Drag up for more

Movies

Hide ↓

▼ Attempt on 20/04/25 11:32 am (Attempt #1)

Q: Which movie won the Oscar for Best Picture in 2020?
Your Answer: Parasite
→ Correct

Q: Which movie features the quote "I'll be back"?
Your Answer: The Terminator
→ Correct

Q: Who directed the movie "Inception"?
Your Answer: Christopher Nolan
→ Correct

Q: Which actor played Jack in "Titanic"?
Your Answer: Leonardo DiCaprio
→ Correct

Q: What is the highest-grossing movie of all time (as of 2024)?
Your Answer: Avatar

Leaderboard: When you click on 'Leaderboard' button in user panel this window will open. Here, a use can view which user is at top depending on overall score or based on a particular quiz.

Quiz Application — □ ✕

🏆 **Leaderboard** | Global Leaderboard ▼ |

Rank	Name	Score
1	Aananya Tiwari	78%
2	Provat Naqa	73%
3	Demo User	13%

← Back to User Panel

Quiz Application — □ ✕

🏆 **Leaderboard** | Science ▼ |

Rank	Name	Score
1	Provat Naqa	100%
2	Aananya Tiwari	26%
3	Demo User	13%

← Back to User Panel

Quiz Application — □ ✕

🏆 **Leaderboard** | Technology ▼ |

Rank	Name	Score
1	Provat Naqa	100%
2	Aananya Tiwari	93%
3	Demo User	50%

← Back to User Panel

Quiz Application — □ ✕

🏆 **Leaderboard** | Geography ▼ |

Rank	Name	Score
1	Aananya Tiwari	100%
2	Provat Naqa	80%
3	Demo User	26%

← Back to User Panel

Admin Login: This is the admin login screen, pretty much self-explanatory, enter your credentials and login.

Admin Panel: After successful login this window will open, i.e. Admin Panel. Here you have the options to Add Quiz, or Edit/Delete an existing quiz.

Add Quiz: When you click 'Add Quiz' Button this window opens. Here you first have to add a valid title to be able to add questions. Without title questions adding fields are disabled. If the title already exists with few questions, then it will show a notification "<Title name> exist with x no. of question new questions will be added after" means you can still add questions to an existing quiz topic, and the new questions will be appended.

After successfully adding quiz title click on 'add title' button, the question fields will be enabled. Enter your questions and the options and the correct answer then either click 'add another' button to keep on adding more questions and at last click save to save all those in data base or if you want to add just one question then directly click save after adding one question. At least one question must be there to save, no duplicate questions were allowed and if you want to cancel/exit just click 'cancel button'. If you forgot to click save at the end, no questions will be saved to the database. And at last, it also shows the number of questions you have currently added at the top. The Edit/Delete Section is disabled when you are quiz adding mode to avoid unnecessary errors. It will be enables again if you click 'cancel' which will save nothing and exit or by clicking save button but there must me at least one question to save.

Edit/Delete Quiz: When you click on 'Edit/Delete Quiz' button this window will open. Here you have to select the quiz title from the drop-down box and the first question of that quiz automatically loads and on side of the drop-down box it shows the number of questions that quiz currently has and the question number you are currently in. And at the bottom, navigation buttons are there 'next' and 'previous' by clicking it you can navigate through all the available questions. The question, their options and right option, all are shown there in appropriate field you just need to edit whatever field you want and click on save and then click on next/previous to edit other questions. Every time you edit a question you need to click save first. If you want to delete a particular question then navigate to that question and press 'delete question button', the question will be deleted. Or if you want to delete a quiz, just click on 'delete quiz' button, it will delete that quiz and all the questions related to it. After everything is done, click on 'done' button to finally save and exit edit/delete quiz mode. If no changes were made nothing will be saved on clicking done button and you will return to admin panel, if any changes were made then clicking on done button will save the changes and then will return to admin panel.

Quiz Application

Edit / Delete Quiz

Select Quiz: Science ▼   **Question 1 of 15**

Quiz Title:
Science

Question:
What is the main function of ribosomes in a cell?

Options:
Energy production

Protein synthesis

DNA replication

Transport

Correct Answer:
◯ Option 1 ⦿ Option 2 ◯ Option 3 ◯ Option 4

| ← Previous | 🖫 Save | Next → |
| ✖ Delete Question | ✖ Delete Quiz | ✓ Done |

Admin Panel

+ Add Quiz

✎ Edit/Delete Quiz

← Logout

Apr 20, 2025 01:10:53 pm

Alert Box: Alert box to show alerts.

Confirmation

Do you want to close the application? ?

Yes   No