StarMap Application README

Overview

The StarMap application offers an immersive platform for stargazing enthusiasts to explore the night sky, engage in educational quizzes, manage user profiles, and interact with celestial objects. This Java-based application integrates with a MySQL database to provide dynamic content and personalized user experiences.

Features and Functionality

IntroPage3 Class

The `IntroPage3` class serves as the entry point to the application, presenting a JFrame with an animated background panel featuring moving stars.

- **Login Functionality**: Existing users can authenticate themselves by entering their username and password. The application verifies these credentials against the `user` table in the MySQL database.
- **Account Creation**: New users can register by providing their name, desired username, password, and location. Upon successful account creation, the information is stored securely in the `user` table for future logins.
- **Dynamic Background**: The animated starry background creates an immersive atmosphere for users interacting with the application.

QuizPage Class

The `QuizPage` class hosts interactive quizzes by fetching random questions from a MySQL database (`stars500`) and updating user scores based on their answers.

- Each login displays a randomly selected question fetched from the `quiz` table in the database.
- Users select an option, and their answer is evaluated against the correct answer stored in the database.
- Scores are dynamically updated based on correct answers, allowing users to track their progress and knowledge of astronomy.

DatFile Class

The `DatFile` class fetches star data from a MySQL database (`stars500`) and processes it to create a 2D array representing the night sky.

- Connects to a MySQL database to retrieve detailed information about stars, including their celestial coordinates, magnitude, and spectral classification.
- Converts celestial coordinates to screen coordinates for rendering, allowing users to visualize star positions accurately on the virtual sky map.
- Adjusts star magnitude based on spectral index and visibility, enhancing the realism and beauty of the starry night simulation.

UserPage Class

The `UserPage` class displays user statistics, including leaderboards, favorites, and achievements, fetched from a MySQL database (`stars500`).

- Leaderboard Display: Shows usernames and scores in descending order, allowing users to compare their performance with others.
- Favorites List: Showcases stars favorited by the user, providing quick access to preferred celestial objects for further exploration.
- Achievements Tracker: Lists earned badges and accomplishments based on user interactions and quiz performance.

StarMap Class

The `StarMap` class initializes the main application window, incorporating interactive features, dynamic animations, and user interface components.

- Animated Background: Features a dynamic background with moving stars to create an immersive stargazing experience.
- Rocket Animation: Enhances visual appeal by incorporating animated elements like a rocket moving across the screen, adding to the cosmic ambiance.
- Customizable Profiles: Allows users to upload a profile picture and view their unique username and user ID, fostering a personalized and engaging user experience.

Usage

1. **Main Menu**: Launch the StarMap application to access the main menu.
2. **Login or Create Account**: Use existing credentials to log in or register as a new user to unlock the application's features.
3. **Explore the Night Sky**: Interact with the night sky by participating in quizzes, viewing user profiles, and exploring celestial objects.

4. **Track Progress**: Monitor quiz scores, achievements, and favorites to enhance knowledge and engagement with astronomy topics.
5. **Customize Profiles**: Personalize user profiles with profile pictures and unique settings to make the experience more immersive.

Dependencies

- Java SE Development Kit (JDK)
- MySQL Connector/J for database connectivity
- Java Swing for GUI components

File Structure

- `IntroPage3.java`: Manages user authentication and account creation functionalities.
- `QuizPage.java`: Hosts interactive quizzes and updates user scores based on quiz performance.
- `DatFile.java`: Retrieves and processes star data from the MySQL database for rendering the night sky.
- `UserPage.java`: Displays user statistics and profiles, including leaderboards, favorites, and achievements.
- `StarMap.java`: Initializes the main application window and incorporates interactive features for stargazing exploration.

Conclusion

The StarMap application combines educational content with interactive features to offer users a captivating journey through the cosmos. By leveraging Java programming and MySQL database integration, StarMap provides an engaging platform for stargazing enthusiasts, learners, and curious minds alike.