

# **Citizenship Assessment System for Masathai**

## **OVERVIEW**

The Citizenship Assessment System is designed to facilitate the integration of newly naturalized citizens into their host countries by providing a user-friendly web-based platform for learning about the history and culture of their nation. This document will guide you through the key features and functionality of the system, helping you make the most of your experience.

## **FEATURES**

### **1. Question Bank**

- The system offers a comprehensive set of questions for each chosen nation, covering historical, cultural, and geographic characteristics.
- Users can access and answer up to twenty questions, gaining valuable insights into their host country.

### **2. User Profiles**

- Create your own user profile to track your progress and evaluation history.
- This feature allows you to monitor your performance over time, ensuring you are continually improving your knowledge.
- Registration is required for those who wish to play the quiz game. Register and enjoy the experience.

### **3. Scoring and Feedback**

- Receive prompt scoring and detailed feedback after each evaluation.
- The system provides insight into your areas of strength and areas that need improvement.
- Use this feature to enhance your understanding of your host country's history and culture.

## **GETTING STARTED**

1. **Registration:** If you are a new user, start by registering for an account. This will allow you to create a user profile and keep track of your progress.
2. **Login:** For existing users, simply log in to access your user profile and continue your assessment journey.

3. **Select a Nation:** Choose the nation whose history and culture you want to learn about. The system offers a variety of nations for you to explore.
4. **Take an Assessment:** Once you've selected a nation, start taking assessments by answering a series of questions. The system will provide you with scores and feedback at the end of each assessment.
5. **Review and Improve:** Use feedback to identify areas that need improvement and keep track of your progress through your user profile.

## **Implementation of Object-Oriented Programming (OOP) Principles**

### **1. Encapsulation:**

Example: Private instance variables in classes, such as `button_signup`, `button_log_in`, `tf_username`, etc., are encapsulated within their respective classes (e.g., `SignUpController`). This encapsulation ensures that these variables are not directly accessible outside their classes, promoting information hiding and preventing unintended modifications.

### **2. Abstraction:**

Example: The `changeScene` method in `DBUtils` abstracts the process of changing scenes. It provides a high-level interface for scene transitions without exposing the underlying complexities of JavaFX scene management. Users of this method do not need to understand the intricate details of how scenes are loaded and displayed.

### **3. Inheritance:**

Example: Although there is no explicit inheritance in the provided code, JavaFX controllers typically implicitly inherit from the `Initializable` interface. In JavaFX, the use of custom controls, event handling, or overriding certain lifecycle methods involves inheritance from existing classes or interfaces.

### **4. Polymorphism:**

Example: The `changeScene` method in `DBUtils` can be considered polymorphic. It can dynamically handle various scenarios, such as loading different FXML files and controllers

based on the parameters provided. This flexibility allows the method to adapt to different requirements at runtime.

## **5. Modularity:**

Example: Each class in the code (e.g., SignUpController, DBUtils, LoggedInController, QuizController) encapsulates a specific set of functionalities. For instance, DBUtils handles database interactions, SignUpController manages the sign-up process, and QuizController controls the quiz functionality. This modular organization enhances code readability, maintainability, and reusability.

## **6. Dependency Injection:**

Example: The DBUtils class is used for database interactions, and its methods are called from various controllers. This is an example of dependency injection, where the controllers depend on the DBUtils class to perform database-related tasks. This promotes loose coupling, making it easier to substitute or extend functionality in the future.

## **7. Composition**

Example: The SignUpController class composes a complete sign-up process by utilizing methods from the DBUtils class. Instead of implementing the entire database interaction within SignUpController, it composes the process by leveraging the functionalities provided by another class (DBUtils).

## **8. Single Responsibility Principle (SRP):**

Example: Each class adheres to the SRP by having a specific and well-defined responsibility. For example, DBUtils manages database interactions, SignUpController handles the user sign-up process, and LoggedInController controls the behavior of the logged-in state. This ensures that each class has a single reason to change, promoting maintainability.

## **9. Open/Closed Principle (OCP):**

Example: While not explicitly demonstrated in the provided code, the modular structure allows for extension without modification. For instance, new functionalities can be added by introducing new classes or extending existing ones. This aligns with the OCP, enabling the codebase to accommodate new features without altering existing code.

## **Conclusion:**

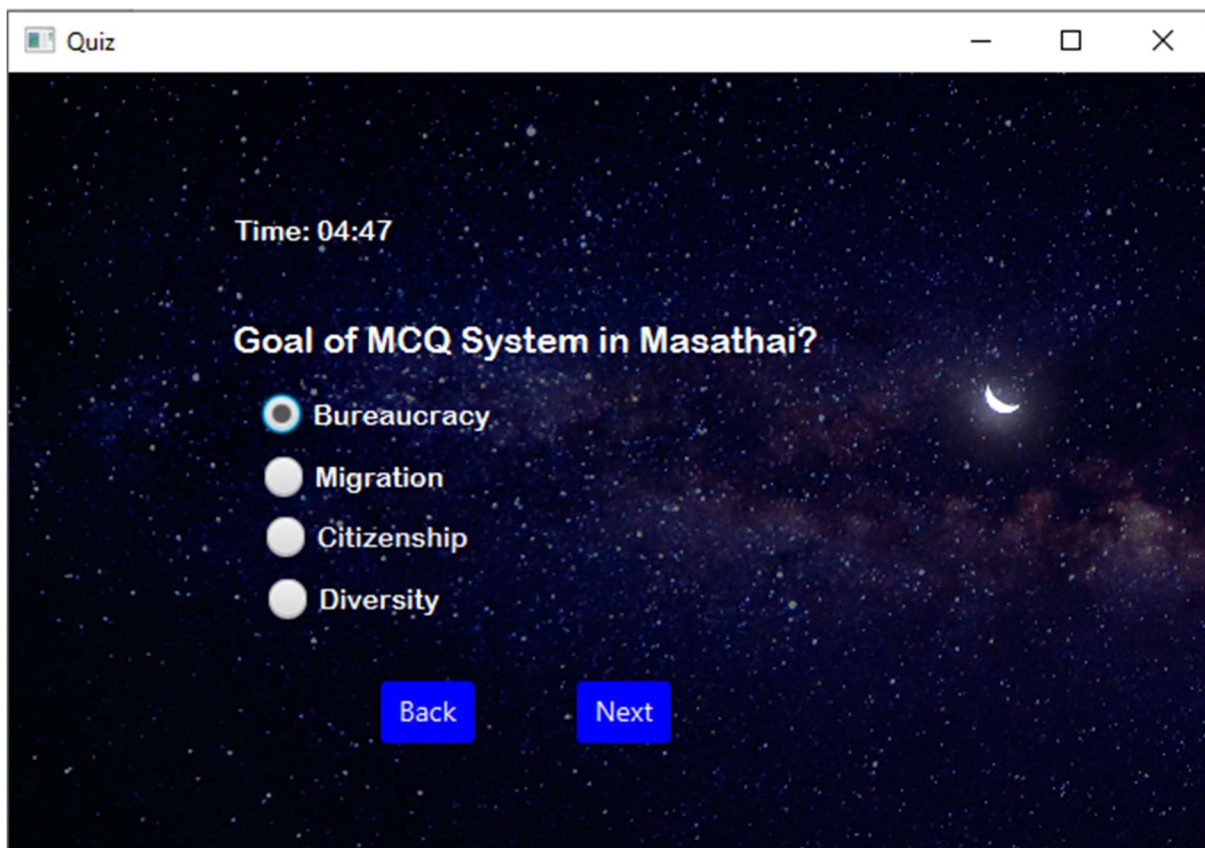
To sum up, the above code demonstrates a strong implementation of several OOP concepts, which helps to create a JavaFX application that is organized, modular, and maintainable. Together, the guidelines improve code readability, encourage reuse, and make future expansion easier.

### **Application Testing**

In order to guarantee the functionality, security, and user experience of any application, testing is an essential stage in the development and implementation process. A variety of tests can be conducted on the Citizenship Assessment System to ensure its efficacy and dependability. Some testing considerations are as follows:

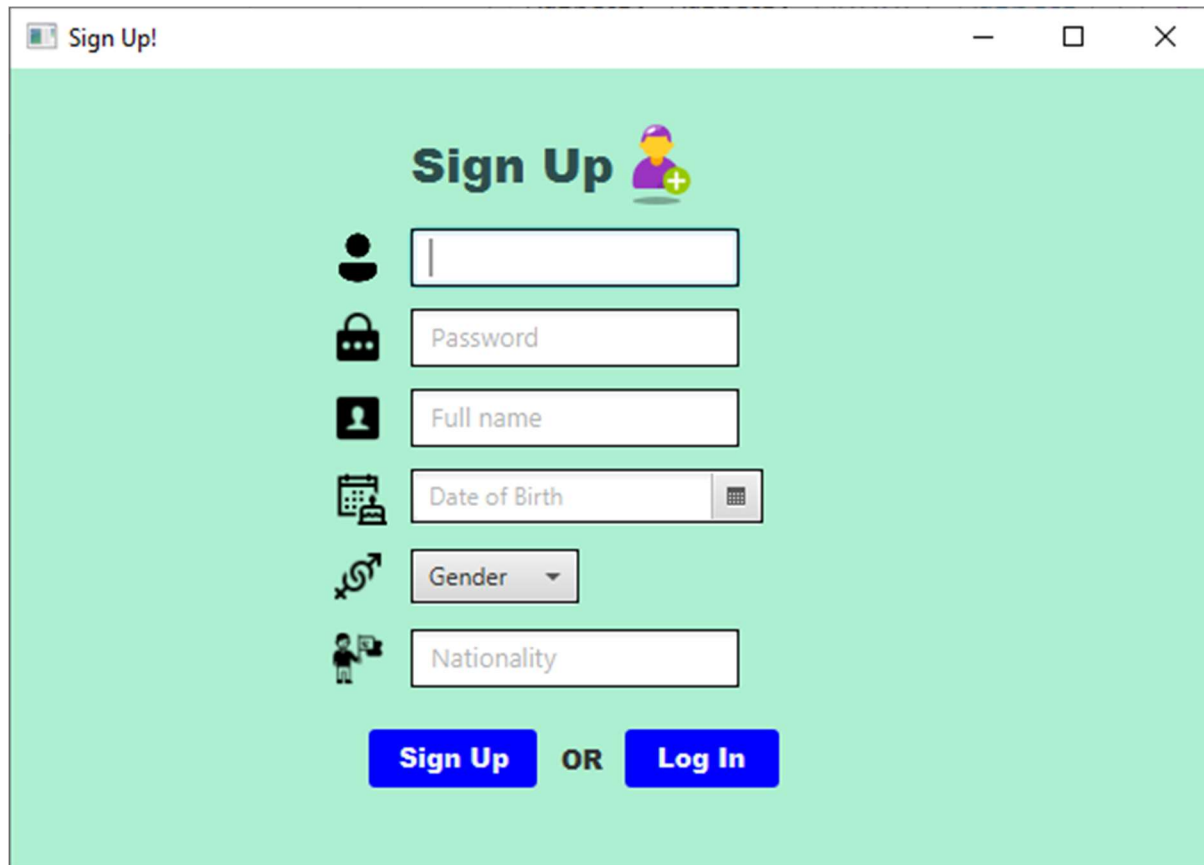
1. Functionality testing:

- successfully tested the Question Bank's functionality, enabling users to view and respond to inquiries about historical, cultural, and geographic features.
- Verified that user profiles could be created without any problems, that logins worked, and that progress could be accurately tracked over time.

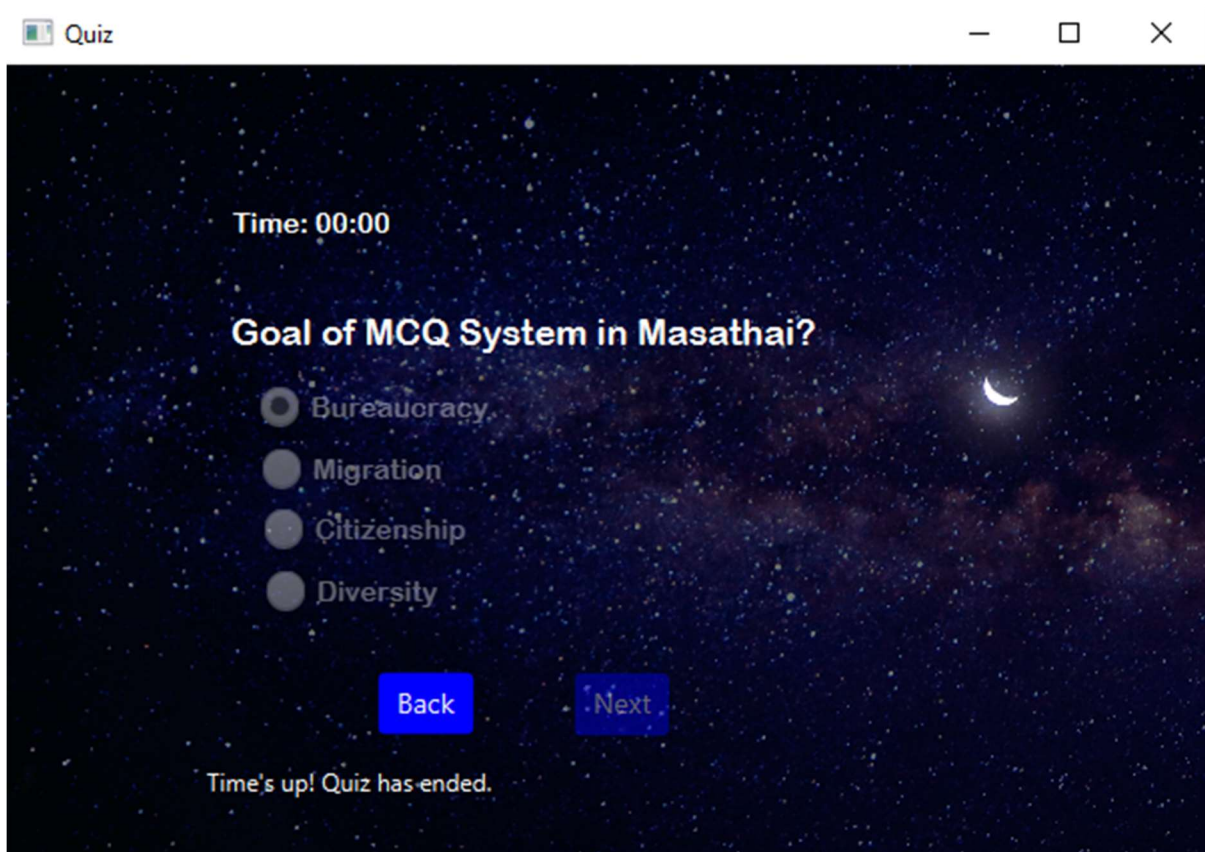


## 2. User Experience Testing:

- Verified that the UI is responsive, easy to use, and arranged neatly across a range of screens and devices.
- Easy navigation and interface which enables user to simply register and login effectively.
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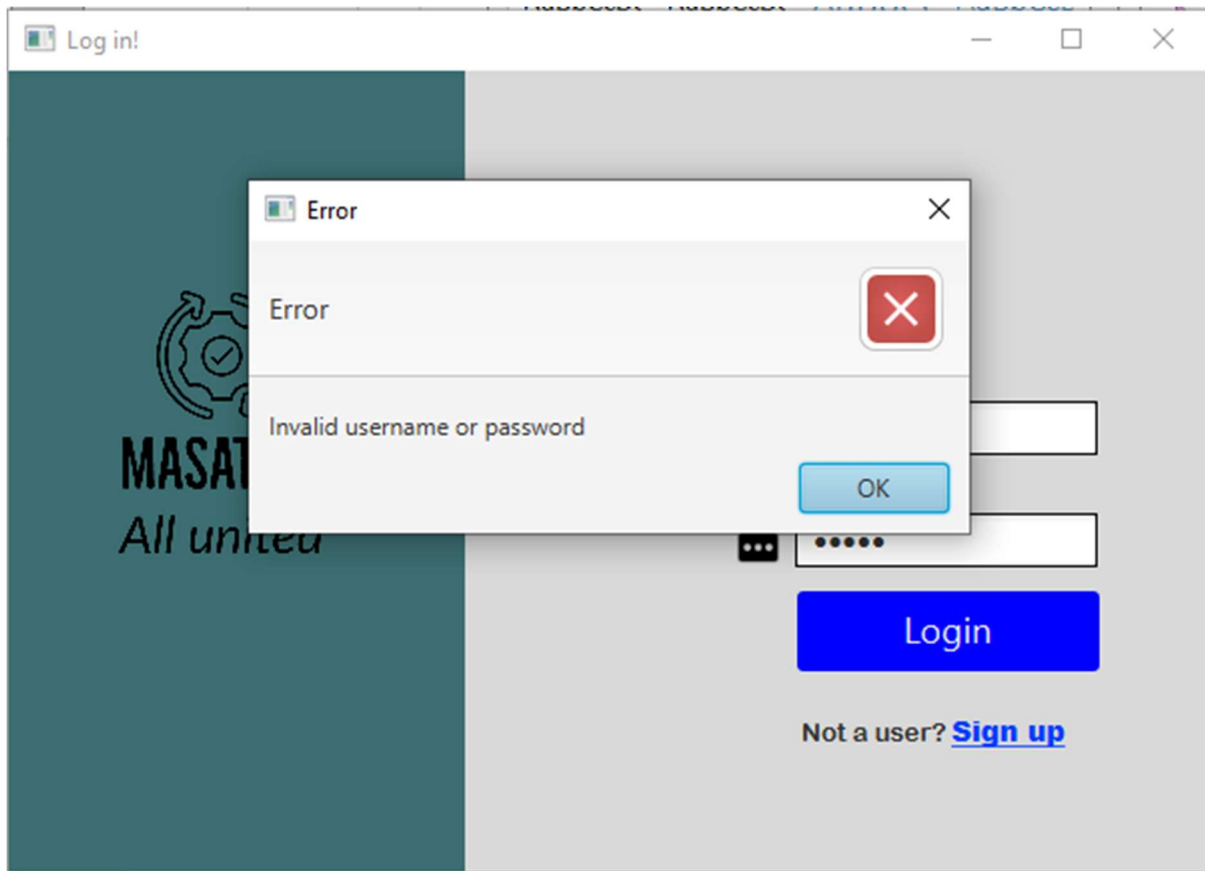


The image shows a web browser window titled "Sign Up!". The background is a light green color. At the top center, the text "Sign Up" is displayed in a bold, dark green font, accompanied by a small icon of a person with a plus sign. Below this, there are six input fields, each preceded by a small icon: a person icon for the first field, a padlock icon for the second, a person icon for the third, a calendar icon for the fourth, a gender icon for the fifth, and a person icon for the sixth. The fields are labeled "Username", "Password", "Full name", "Date of Birth", "Gender", and "Nationality". At the bottom of the form, there are two blue buttons: "Sign Up" and "Log In", separated by the text "OR".



### 3. Security Testing:

- verified the efficiency of the permission and authentication procedures to limit access to only authorized users.
- Registered users will be only to login and play the quiz below is the example of the unauthorized access not able to login



## Conclusion

To sum up, the goal of this rigorous testing procedure was to strengthen the Citizenship Assessment System so that it becomes a symbol of reliability, security, and a satisfying user experience. The extensive analysis, which includes the Question Bank, User Profiles, and Assessment procedures, confirms that the system is ready for implementation. Users may explore the history and cultures of their host nations with confidence, knowing that the platform will function smoothly and dependably while they do so.

The findings highlight not only a well-thought-out system but also a dependable and educational resource for people wishing to learn more about their adoptive countries. The Citizenship Assessment System is more than just a data base; it's an engaging and interactive tool. The system is not just a tool, but a flexible and welcoming environment with strong security features, responsive design, easy navigation, and seamless integration. It is perfectly suited to support newly naturalized citizens' integration journey by providing them with an interesting, educational, and technologically empowered experience.