Institute of Arts and Sciences (Chiniot Campus)
Govt College University Faisalabad

Software Requirement Specification

(SRS Document)

For

Quiz Management System

By

Abubakar Saeed **2022-GCUF-07200**

Muhammad Faizan **2022-GCUF-07186**

Instructor

Dr. Waqar Hussain

Bachelor in Computer Science (2022-2026)

Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of this document is to provide a detailed description of the Quiz Management System, outlining its features, functionalities, and requirements. It serves as a guide for developers, testers, and other stakeholders involved in the development and maintenance of the system.

1.2 Intended Audience

This document is intended for:

- *Developers*
- *Testers*
- *Project Managers*
- *Stakeholders involved in the Quiz Management System*

Readers are advised to review the document thoroughly to understand the requirements and constraints of the system.

1.3 Project Scope

The Quiz Management System is designed to facilitate the creation, administration, and evaluation of quizzes. It aims to provide an interactive platform for students to take quizzes and for instructors to manage quiz content.

1.4 Definitions

Student

In the context of the Quiz Management System, a student refers to an individual who interacts with the system primarily to participate in quizzes. Students have the capability to log in, take quizzes, view their scores, and access relevant educational materials.

Instructor

An instructor is a user role responsible for creating, managing, and overseeing quizzes within the Quiz Management System. Instructors have administrative privileges that allow them to design quiz content, manage quiz rules, and perform other administrative functions.

User

The term "user" refers to any individual, either a student or an instructor, who interacts with the Quiz Management System. Users engage with the system through a user interface to perform actions such as quiz participation, creation, and management.

Administrator/Admin

An administrator, often referred to as admin, is a user with elevated privileges responsible for system configuration, user management, and overall system maintenance. Admins have access to features and settings beyond those available to regular users.

Input

Input is the data or information that a system receives from the external environment. It serves as the raw material for processing within a system.

In a computer program, user keyboard entries, mouse clicks, or data from sensors can be considered as input.

Output

Output is the result or information produced by a system or process after the input has been processed.

In a computer program, the output could be displayed on a screen, printed on paper, or saved in a file.

Prompt

Prompt refers to a message or indicator that prompts the user to provide input. It's a way for the program to communicate with the user.

Quiz

A quiz is a set of questions designed to assess a user's knowledge on a specific subject or topic. In the Quiz Management System, quizzes are created by instructors and taken by students.

Score

The score represents the numerical result obtained by a student upon completing a quiz. It reflects the correctness of the answers given by the student and contributes to their overall performance evaluation.

Percentage

Percentage is a metric calculated by dividing the total score obtained by a student in a quiz by the total possible score and multiplying the result by 100. It provides a standardized measure of performance.

Grade

The grade is an alphanumeric representation of a student's performance, typically derived from their percentage score. Grades may include categories such as A, B, C, D, or Fail, providing a quick summary of the overall performance.

High of Fame

Hall of Fame refer to the top performance achievements recorded in the system. The system tracks and displays high scores, showcasing the users who achieved notable success in quizzes.

2. Overall Description

2.1 Product Perspective

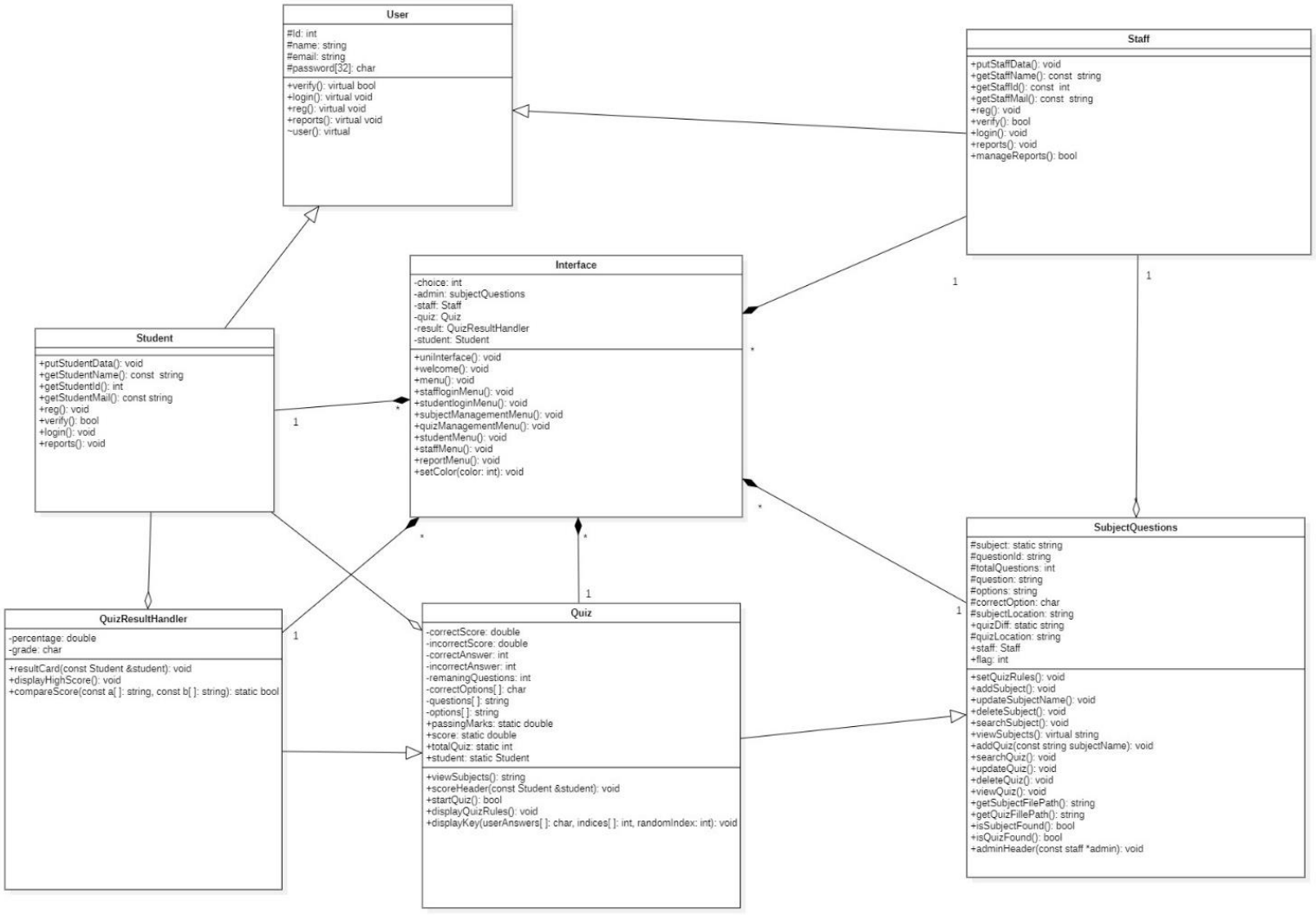
The Quiz Management System will function as a standalone application, interacting with users through a console-based user interface. It will be designed to support various user roles, including students and instructors.

2.2 Product Features

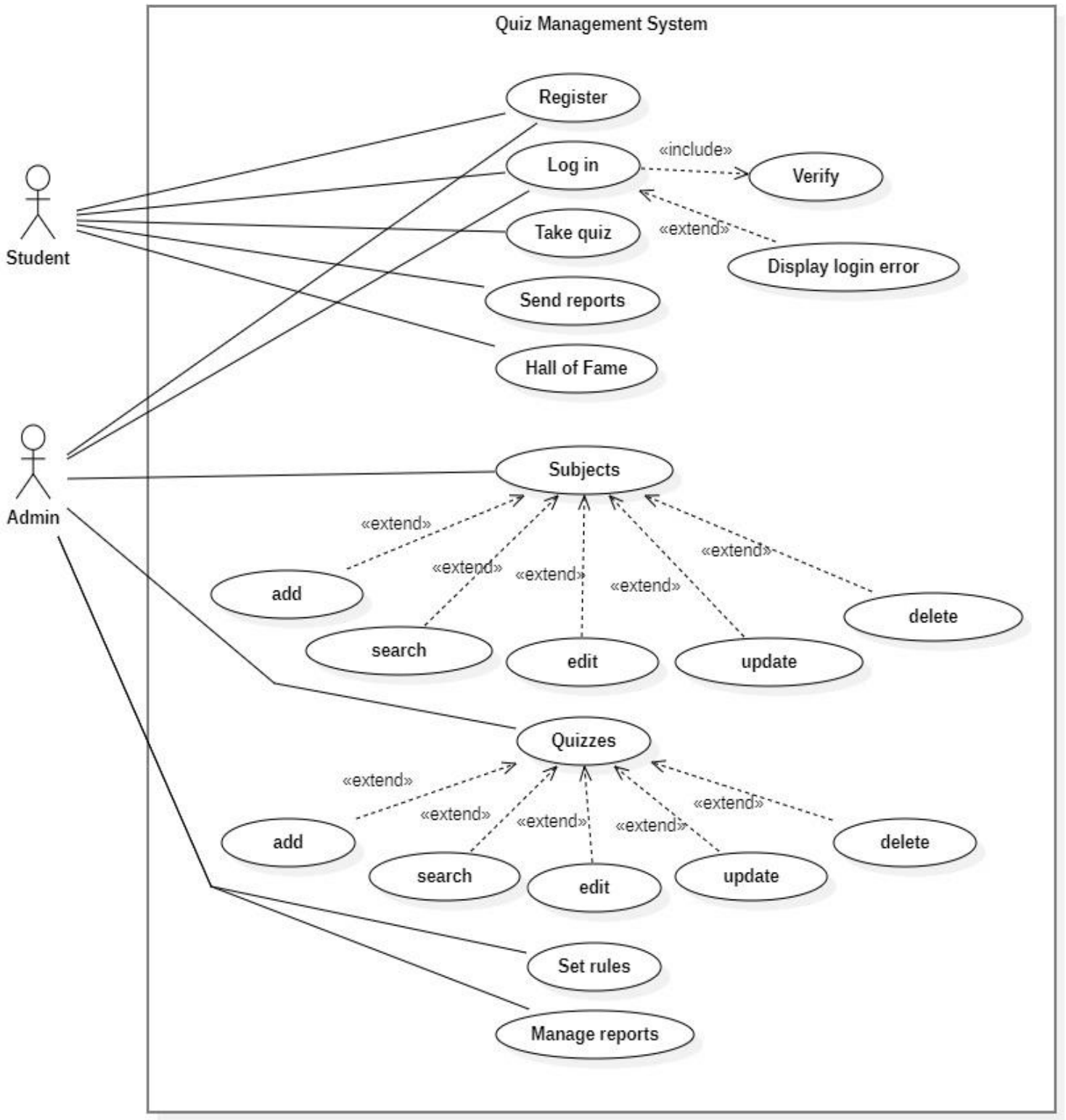
- *User authentication and authorization*
- *Quiz creation and management*
- *Randomization of quiz questions*
- *Immediate feedback on quiz completion*
- *High-score tracking*
- *Automatic result card generation of students.*

2.3 User Classes and Characteristics

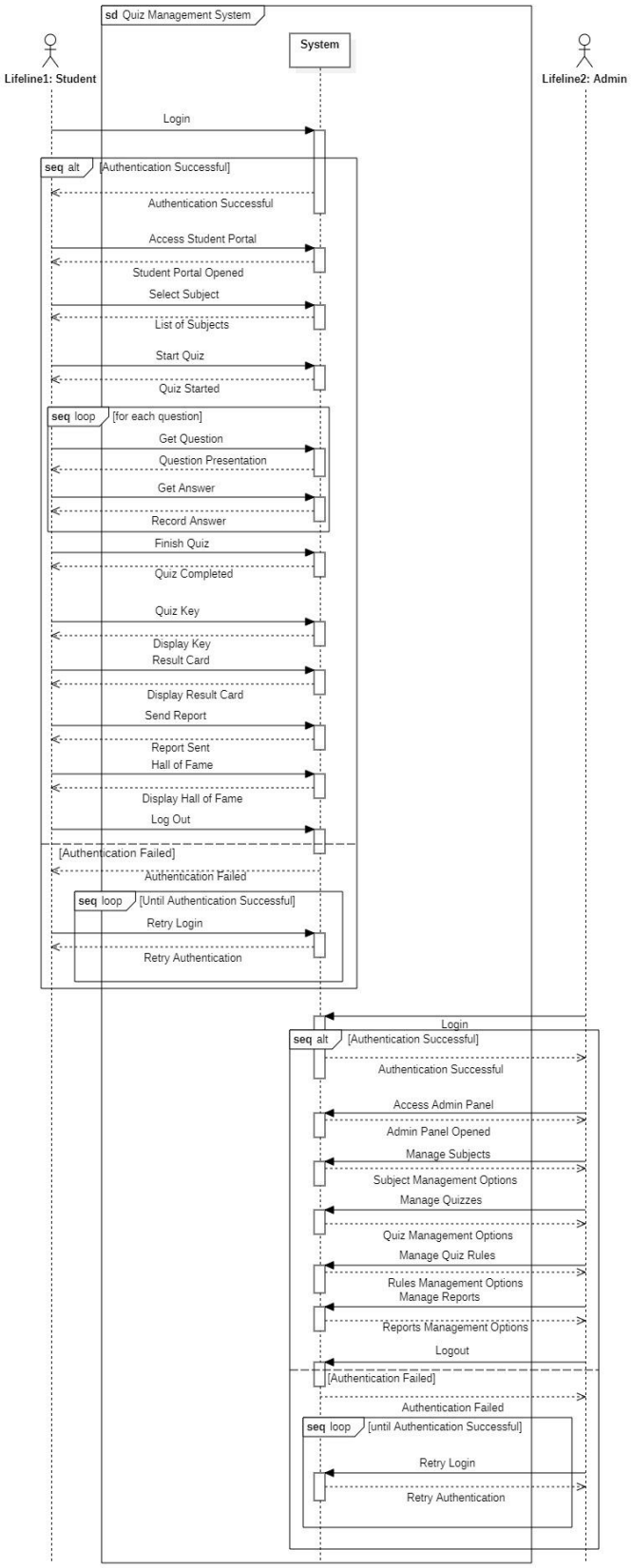
Class Diagram



Use Case Diagram



System Sequence Diagram



2.4 Operating Environment

The system will be compatible with Windows operating systems.

2.5 Design and Implementation Constraints

- *The system will be developed using C++ Programming Language.*
- *The database will be simple txt files.*
- *Compatibility with latest version of C++.*

2.6 User Documentation

Comprehensive user documentation will be provided, including user manuals and guides for both students and instructors.

2.6.1 Concepts

Object-Oriented Programming (OOP) Principles:

- **Class**
    - *Classes Used:*
    - **User:** *acts as an interface class for Student and Staff*
    - **Student:** *Represents a student with a name, email and student ID.*
    - **Staff:** *Represents a staff with a name, email and staff ID*
    - **Quiz**: *Represents the core quiz functionality, including score calculation.*
    - **SubjectQuestions:** *Manages information about quiz subjects and difficulty levels.*
    - **Interface:** *Provides a user interface for interacting with the quiz system.*
    - **QuizResultHandler:** *Handles quiz result generation and high score display.*

    - **Explanation***: A class is a user-defined data type that we can use in our program, and it works as an object constructor, or a "blueprint" for creating objects*

- **Encapsulation**

    - **Private Members:** *Various data members in classes are marked as private, encapsulating the internal details of each class***.**

    - **Explanation:** *Encapsulation is the bundling of data and the methods (functions) that operate on the data into a single unit, i.e., a class. This helps in controlling access to the data by providing access specifiers (public, private, protected).*

- **Abstraction**

    - *Each class encapsulates specific functionality, exposing only essential details to the other parts of the program. We are are using user class as abstract class for Student and Staff.*

    - ***Explanation:*** *Abstraction is the concept of simplifying complex systems by modeling classes based on the essential properties and behaviors.*
- **Inheritance**

    - *Student and staff inheriting from User which is Interface class.*

- *QuizResultHandler inherits from Quiz, indicating an "is-a" relationship.*
- *QuizResultHandler uses protected inheritance to access the protected members of Quiz.*

- ***Explanation:*** *Inheritance is the mechanism by which one class can inherit properties and behavior from another class promoting code reusability.*

- **Composition**

  - *Interface class contains and uses objects of other classes, such as Quiz and QuizResultHandler.*

  - **Explanation:** *Composition refers to the design principle where a class is composed of or contains objects of other classes, enabling the creation of more complex and reusable structures.*

- **Aggregation**

  - *SubjectQuestions and Quiz class contain static objects of Staff and Student class respectively, by using aggregation.*
  - *In QuizResultHandler class we are using aggregation in resultCard function by passing reference of Student object.*
  - *In SubjectQuestions class we are using aggregation in adminHeader function by passing reference of staff object.*

  - **Explanation:** *Aggregation in represents a "has-a" relationship between classes, where one class contains another, but the contained class maintains independence.*

Software Engineering Principles:

- **Development Approach**

  - *The Quiz Management System follows an iterative development model, where the software development process is divided into small, manageable iterations. Each iteration results in a potentially shippable product increment, allowing for flexibility, adaptability, and continuous refinement based on stakeholder feedback.*

- **DRY (Don't Repeat Yourself)**

  - *Avoiding duplicating code by encapsulating common functionalities within classes and methods.*

- **Modularity**

  - **Separation of Concerns:** *Each class represents a specific concern, promoting modularity. Quiz focuses on quiz functionality, Student on student details, Staff on staff details, and Interface on user interaction.*

- **Code Reusability**

  - **Inheritance for Reusability:** *Inheritance is used to reuse the functionality.*

- **Maintainability**

- **Structured Code:** *The code is organized into classes, functions, and headers, enhancing readability and maintainability.*

- **Scalability**
  - **Dynamic Memory Usage:** *Vectors dynamically manage memory, allowing for scalability in storing player scores, records, managing subjects and question loading.*

- **Readability**
  - **Descriptive Identifiers:** *Variable and function names are chosen descriptively, contributing to code readability.*

- **File Organization**
  - **Usage**: *Header files (QuizResultHandler.h, Interface.h, Staff.h), Separation of Concerns.*
  - **Explanation:** *The code is organized into header files and source files, following good practices for file organization and separation of concerns.*

- **Documentation**
  - **Usage:** *Comments, descriptive variable names.*
  - **Explanation:** *The code includes comments that provide information about the purpose of the code blocks. Descriptive variable and function names also contribute to self-documenting code.*

Other Concepts

- **Vectors**
  - *Vectors are used for storing and managing dynamic arrays of data. Vectors are used in several places, such as storing player scores, player records, and comparing scores etc.*
  - **Explanation***: Vectors provide dynamic arrays with automatic resizing. They are used for flexibility in handling a variable number of player scores and records.*

- **Algorithm**
  - *The algorithm header is used for sorting player scores based on the player's quiz score.*
  - **Explanation:** *The algorithm header provides a collection of functions (algorithms) to perform operations on sequences of elements. In this software, sort is used to sort the playerScores vector based on the scores, using the custom comparison function compares cores.*

- **File Handling**
  - *In program we using file handling to persistently store and retrieve data, separating concerns by saving results in individual files, managing quizzes, managing subjects and loading questions etc.*

- **Exception Handling**
    - *To guarantee code robustness, we used error-handling techniques such as file existence checks and appropriate user input validation. For increased dependability, confirm the existence of the file before opening it, respond properly to successful actions, and manage invalid user input.*
- **Unique File Naming**
    - *The header file direct.h is being used. When storing student quiz results, create file names dynamically to prevent overwriting already-existing files.*

2.7 Assumptions and Dependencies

- *Users are assumed to have access to a computer with a Windows operating system.*
- *The system relies on standard input and output for user interactions.*
- *The console-based application assumes that users are familiar with basic command-line interactions.*
- *Dependencies include the availability of the C++ runtime environment on users' machines.*
- *Any changes in the Windows environment or command-line interface may affect the application's functionality.*

3. System Features

3.1 Admin Portal

3.1.1 Description and Priority

The Admin Portal enables administrators to manage quizzes, view student results, and perform user management tasks. It includes functionalities for adding new subjects, new quizzes, viewing high scores, and managing quiz rules.

Priority: *High*

3.1.2 Stimulus/Response Sequences

- ***Stimulus:*** *The system displays menus for Admin Portal and Student Portal.*
- ***Stimulus:*** *Users can choose "Admin Portal" to log in or register.*
- ***Response:*** *The system prompts for user details, authenticating the admin located in the Record folder/Staff Record.txt file.*

- ***Stimulus:*** *The system displays options for Subject Management, Quiz Management, managing quiz rules, managing reports, logging out, and exiting.*
- ***Response:*** *The system prompts for user option in the admin Menu.*

- ***Stimulus:*** *Admin selects "Subject Management" to manage subjects.*
- ***Response:*** *The system prompts for the subject name and updates the subject database located in the "Subjects" folder, organized into folders based on difficulty, using the "SubjectList.txt" file.*

- ***Stimulus:*** *Admin chooses "Quiz Management" to manage quizzes.*

- ***Response:*** *The system prompts for the quiz ID and updates the quiz database located in the "Subjects" folder, categorized into folders based on difficulty, utilizing the corresponding "SubjectName.txt" file.*

- ***Stimulus:*** *Admin selects 'Quiz Rules' to establish rules for quizzes.*
- ***Response:*** *The system prompts for quiz rules. If not set, default rules from the database will be used located in the Record folder/Quiz Rules.txt file.*
- ***Stimulus:*** *Admin selects 'Manage Reports' to handle reports sent by students.*
- ***Response:*** *The system displays reports located in the Record folder/Reports.txt file, sent by students for approval.*

- ***Stimulus:*** *Admin selects "logout" to leave the admin portal.*
- ***Response:*** *The system returns to the portal menu.*

- ***Stimulus:*** *Admin exits the Admin Portal.*
- ***Response:*** *The system exits the program.*

3.1.3 Functional Requirements

REQ-1: Admin Authentication and Registration

- *The system should authenticate users by prompting for valid login credentials, with authentication based on the information stored in the "Record" folder / "Staff Record.txt" file.*
- *The system should allow new users to register by providing necessary details, with the registration information stored in the "Record" folder / "Staff Record.txt" file.*

REQ-2: Admin Login

- *Admin must log in with valid credentials to access the Admin Portal, using the authentication mechanism in the "Record" folder / "Staff Record.txt" file.*
- *The system should authenticate admin users securely by validating their credentials against the information stored in the "Record" folder / "Staff Record.txt" file.*

REQ-3: Subject Management

- *Admin can add, edit, or remove subjects from the system, with subject details validated and stored in the "Subjects" folder with easy, medium, and hard difficulty folders according to the chosen subject database.*

REQ-4: Quiz Management

- *Admin can add, edit, or remove quizzes from the system, with quiz details validated for subjects and stored in the "Subjects" folder with easy, medium, and hard difficulty folders according to the choice.*

REQ-5: Quiz Rules

- *Admin can edit rules for the quizzes in the system, with quiz rules validated and stored in the rules database. If rules are not provided, default rules will be stored in the "Record" folder / "Quiz Rules.txt" file.*

REQ-6: Log out

- *Admin can exit the Admin Portal and return to the main menu, with the system providing a function to return to the portal menu.*

REQ-7: Exit

- *Admin can exit the program.*
- *The system should terminate program with appropriate message.*

REQ-8: User Account Permissions

- *Admins have exclusive access to quiz management, subject management, quiz rules, and manage reports features, with access restrictions implemented by the system based on user roles.*

3.2 Student Portal

3.2.1 Description and Priority

This feature provides students with access to quizzes, allowing them to attempt and view their quiz results. Students can navigate through the quiz portal, review scores, and receive feedback.

Priority: *High*

3.2.2 Stimulus/Response Sequences

- ***Stimulus:*** *The system displays menu for Admin Portal and Student Portal.*

- ***Stimulus:*** *User choose "Student Portal" to login or register.*
  Response: *The system prompts for user details to log in or register the student and authenticate from the location which is in Record folder with Student Record filename.*

- ***Stimulus:*** *The system displays options for Start Quiz, view Hall of Fame, send report log out, and Exit.*

- ***Stimulus:*** *Students choose "Start Quiz" from the Menu.*
- ***Response:*** *The system displays quiz rules set by admin, located in "Record" folder with "Quiz Rules.txt" file and then students can choose to take quiz from quiz database, located in the "Subjects" folder, categorized into folders based on difficulty, utilizing the corresponding "SubjectName.txt" file and view result instantaneously and result card file of each student is generating, located in the "Student Results" folder "Student name.txt" file. .*

- ***Stimulus:*** *Students choose "View Hall of fame" from the Menu.*
  Response: *The system displays high score of the user store located in High Score folder with High Score.txt file in ascending order.*

- ***Stimulus:*** *Students choose "send Report" from the Menu.*
  Response: *The system prompts the report details and store located in Record folder with reports.txt file.*

- ***Stimulus:*** *Student select to "logout" and to leave the admin portal.*
  Response: *The system will go to the portal menu.*

- ***Stimulus:*** *Student exit the Student Portal.*
  Response: *The system will exit the program.*

3.2.3 Functional Requirements

REQ-1: Student Authentication and Registration

- *The system should authenticate users by prompting for valid login credentials, with authentication based on the information stored in the "Record" folder / "Student Record.txt" file.*
- *The system should allow new students to register by providing necessary details, with the registration information stored in the "Record" folder / "Student Record.txt" file.*

REQ-2: Student Login

- *Student must log in with valid credentials to access the Admin Portal, using the authentication mechanism in the "Record" folder / "Student Record.txt" file.*
- *The system should authenticate admin users securely by validating their credentials against the information stored in the "Record" folder / "Student Record.txt" file.*

REQ-3: Start Quiz

- *Students should have the option to start a quiz from the menu.*
- *The system should display quiz rules set by the admin before allowing students to proceed located in the "Record" folder "Quiz Rules.txt" file, and then take quiz from quiz database located in the "Subjects" folder, categorized into folders based on difficulty, utilizing the corresponding "SubjectName.txt" file and view result instantaneously and result card file of each student is generating located in the "Student Results" folder "Student name.txt" file. .*

REQ-4: Hall of Fame

- *Students should be able to view the high scores of users in ascending order, with name, id and difficulty located in the "High Score" folder /"High Score.txt" file.*
- *The system shall display relevant information, including player names and scores.*

REQ-5: Send Report

- *Student should have the option to send a report from the menu.*
- *The system should prompt students to provide report details and save the report in the database located in the "Report" folder /"Report.txt" file.*

REQ-6: Log Out

- *Student should be able to log out from the Student Portal.*
- *The system should return to the portal menu upon successful log out.*

REQ-7: Exit

- *Student should be able to exit the Program.*
- *The system should exit the program with appropriate message.*

4. External Interface Requirements

4.1 User Interfaces

The system will have a console-based interface suitable for interaction within a command-line environment on Windows.

4.1.1 Admin Interface

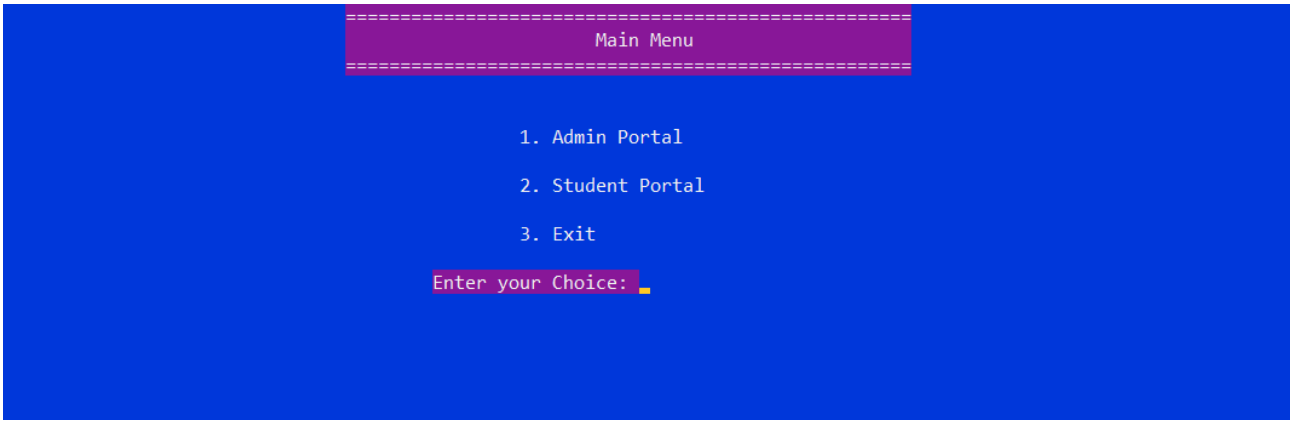
Admin should register before logging in for the first time. There is no limits for adding admins, we can add as many admins as we want, providing extensibility and reusability.

Getting Started

First of all, when you use the program, you will be greeted with a welcome screen displaying the game title and a brief description. Press "Enter" to proceed to the main menu.

Main Menu

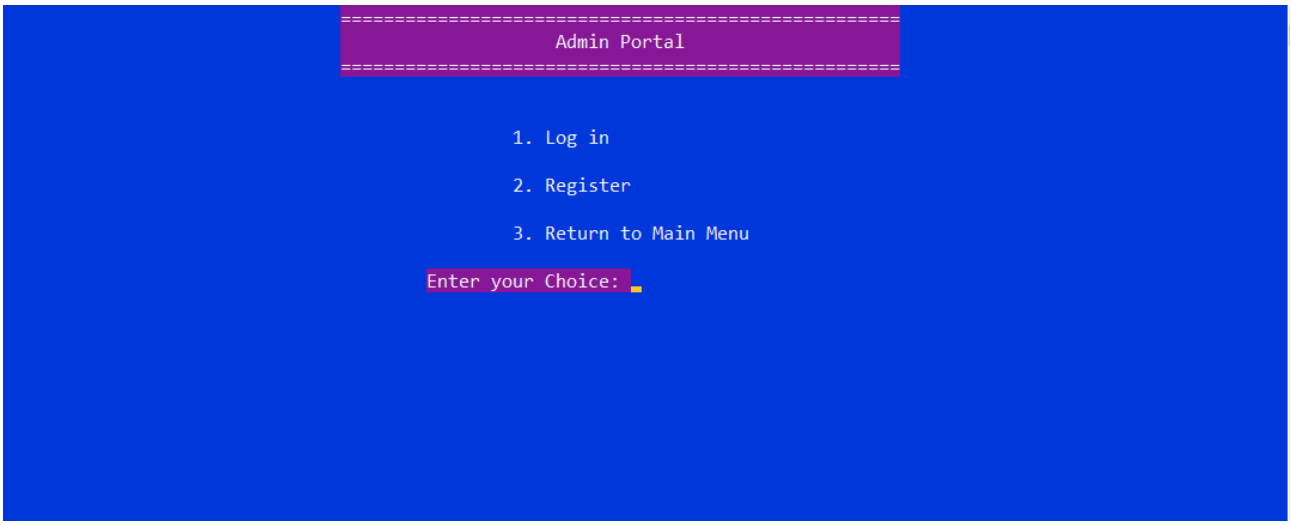
In this menu you have option to login either as student or admin depending upon your authority.



1. **Admin Portal**: *Enter 1 to enter the admin portal.*
2. **Student Portal:** *Enter 2 to enter the student portal.*
3. **Exit:** *Enter 3 to exit the software.*

Admin Portal

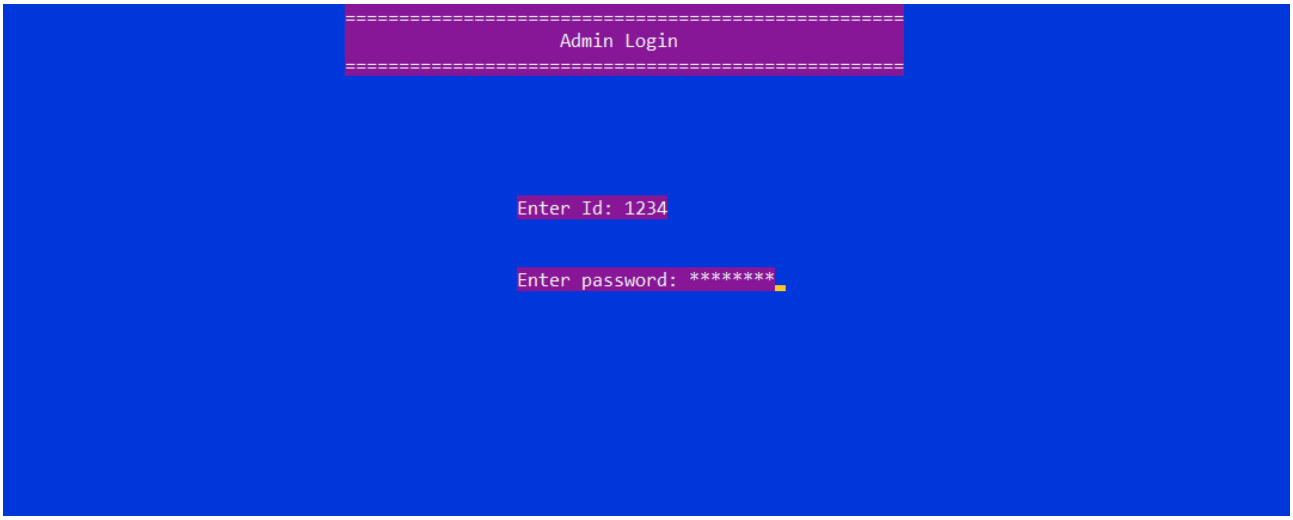
In the admin portal, you are able to see the following options:



1. **Log in:** *Enter 1 to logging into the admin portal.*
2. **Register:** *Enter 2 to registering in the admin portal.*
3. **Return:** *Enter 3 to go back to the main menu.*

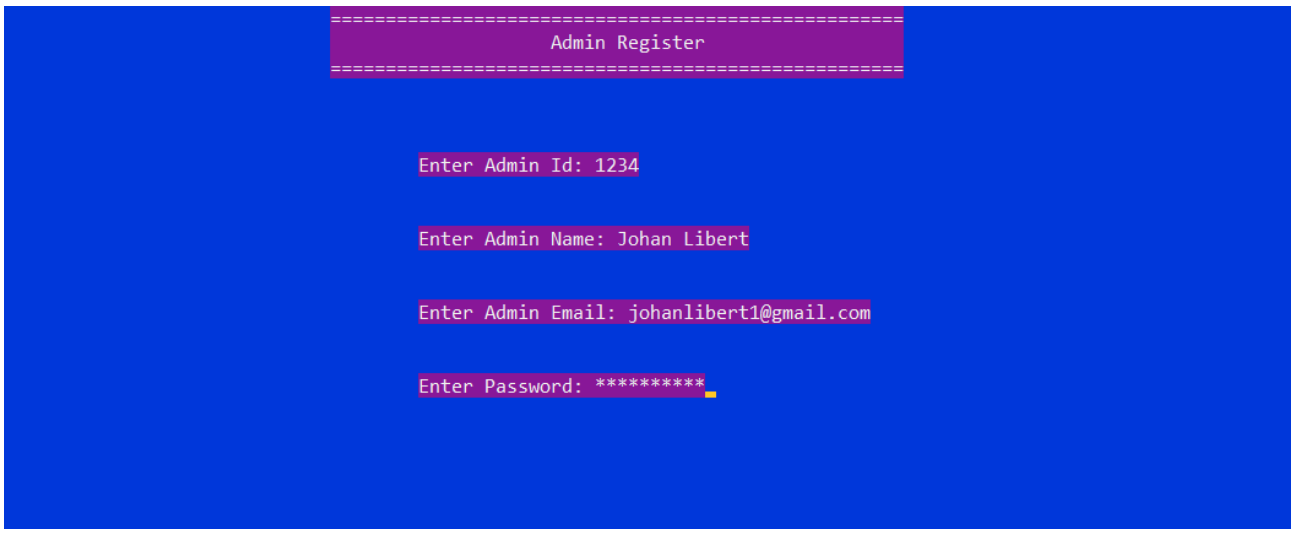
Log in

Upon entering '1' into the admin portal, you will be prompted to input your ID and password. If the entered ID/password is invalid, the computer will display an error message, and the system will prompt you to re-enter the information.



Register

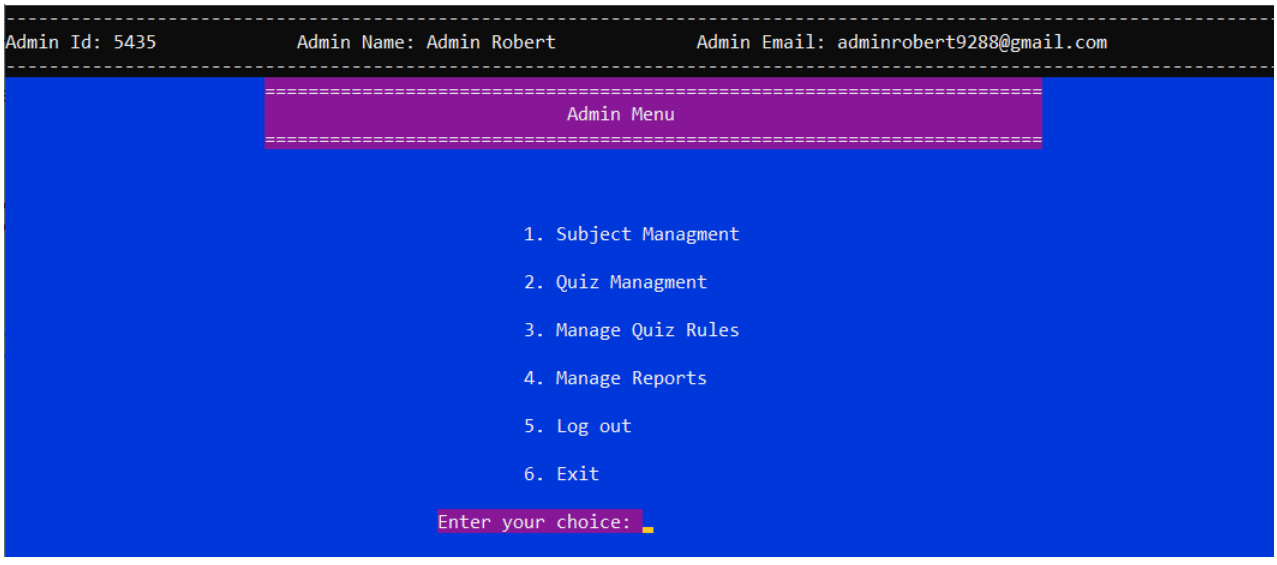
If you are not registered in the admin portal, Enter 2 to register. You will be prompted to enter your ID, name, email, and password to complete the registration process. If the ID is already registered, the system will display an error message and prompt you again.



After successfully registering in the admin portal, you will be able to log in by providing your username and password.

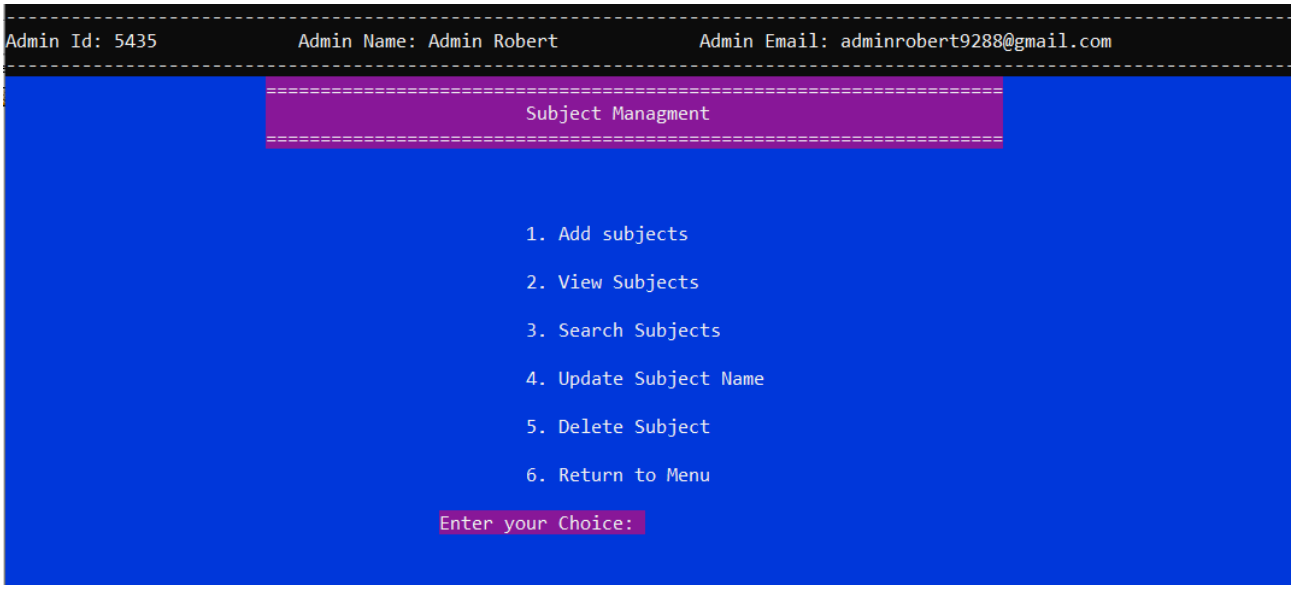
Admin Menu

After successfully logging in, you will see various options.



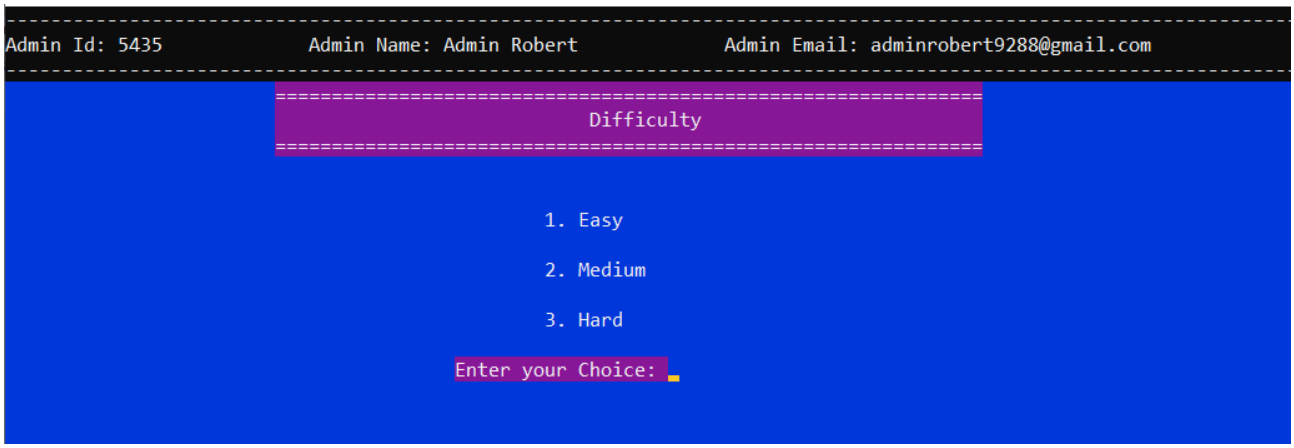
1. **Subject Management***: Enter 1 for managing subjects*.
2. **Quiz Management:** *Enter 2 for managing quizzes.*
3. **Manage Quiz Rules:** *Enter 3 to manage rules for quizzes.*
4. **Manage Reports:** *Enter 4 to manage reports.*
5. **Log Out:** *Enter 5 to log out the portal*
6. **Exit:** *Enter 6 to exit the program*

Subject Management



As an admin, you can manage all subjects by adding, updating, deleting, viewing, and searching for any subject you have added. If subject is already present system will show error and prompt you again to enter different subject. There is no limit on adding subjects; the administration can add as many subjects as they want, promoting flexibility and extensibility.

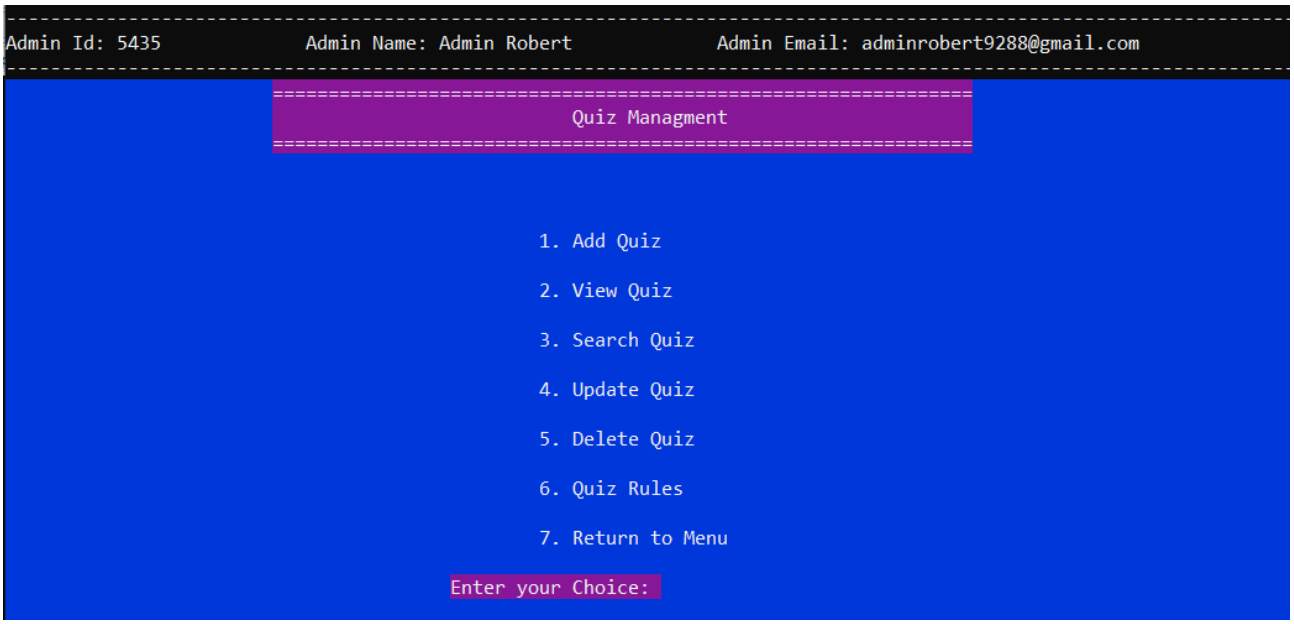
Difficulty Menu



In the difficulty menu, you must select a difficulty level Easy, Medium, or Hard to manage subject. The difficulty of the quiz is determined by the difficulty level of the subject you added.
Note: *The difficulty menu is mandatory in any case of subject or quizzes management.*

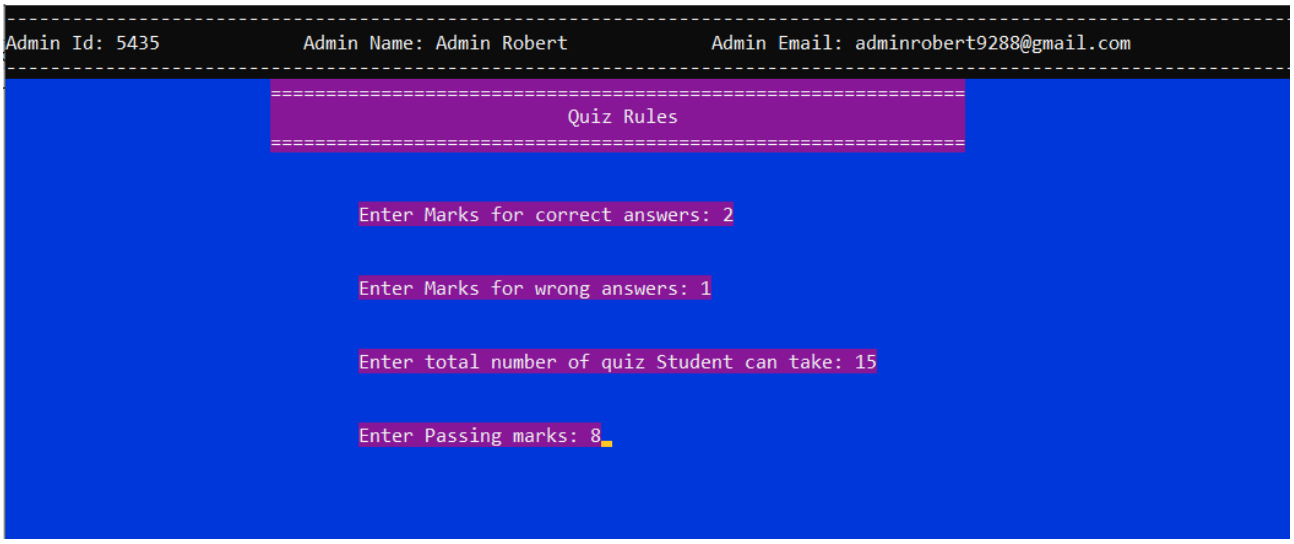
Quiz Management

In the quiz management menu, similar to subjects, you can edit quizzes for players based on the subjects provided in the subject management menu. Each quiz have id .You can manage quizzes by selecting the desired difficulty level. There is no limit on adding quizzes; the administration can add as many quizzes as they want, promoting flexibility and extensibility.



Manage Quiz Rules

Like subjects and quizzes, rules are crucial for effective quiz management. The program provides a feature to manage these rules, and the evaluation of quizzes depends on these rules.

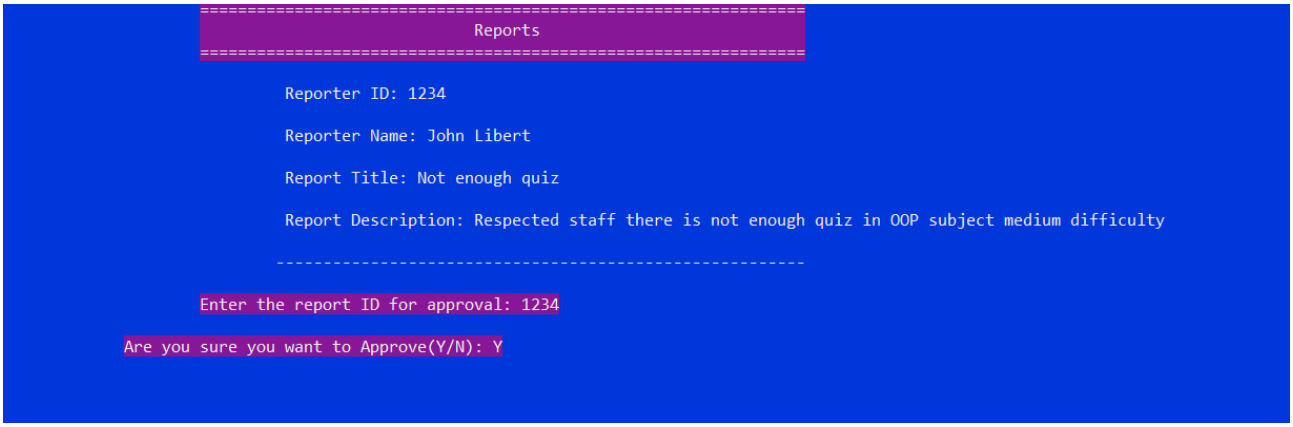


Marks for correct answers: *Enter the specified marks for each correct option. If no rules are provided, it defaults set to 1 mark for each correct answer.*
Marks for wrong answers: *Assign marks for incorrect options. If no rules are provided, it defaults set to 0.5 marks for each incorrect answer.*
Total quizzes: *In this admin set total quiz student can take. If no rules are provided then it set to 10 questions.*

Passing marks: *The passing marks are determined by the correct number of answers required to pass the quiz. If no rules are provided, it defaults set to 5 passing marks.*

Manage Reports

Students can send a report to the admin if they are facing any issues. Here, the admin can approve reports and address student issues.



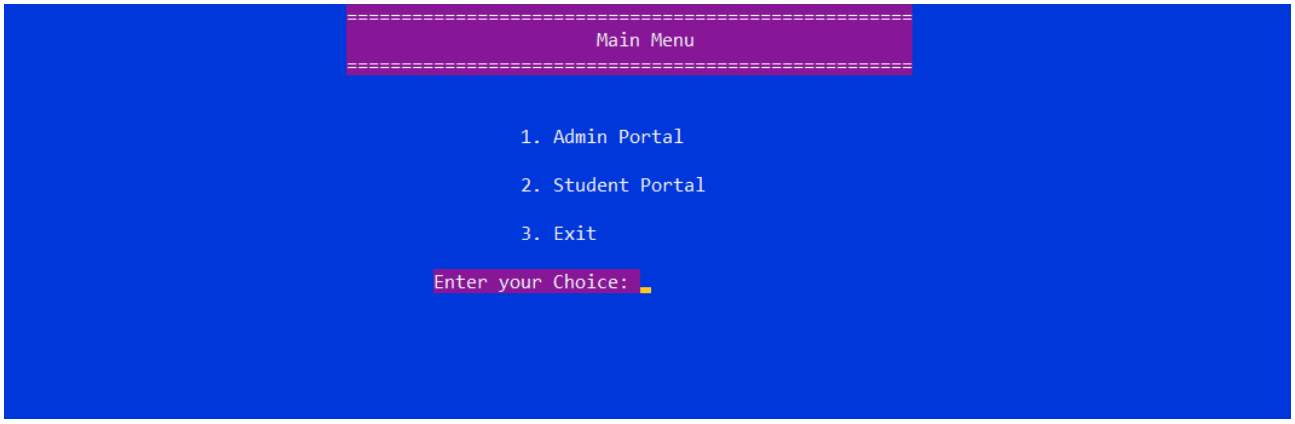
Log out

To exit the portal, you need to log out. Press '5' in the admin menu to log out and return to the main menu. From there, you have the option to either exit the system or enter the Portal again.

4.1.2 Student Interface

Students need to register before logging in for the first time. There is no limits for student, we can add as many admins as we want, providing extensibility and reusability.

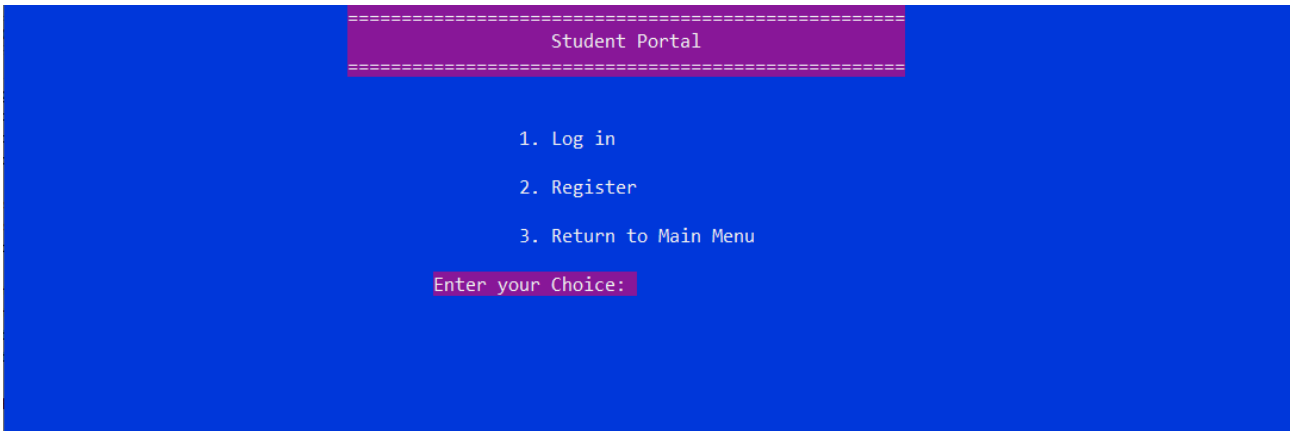
Main Menu



1. **Admin Portal**: *Enter 1 for admin portal.*
2. **Student Portal:** *Enter 2 for student portal.*
3. **Exit:** *Enter 3 to exit the program.*

Student Portal

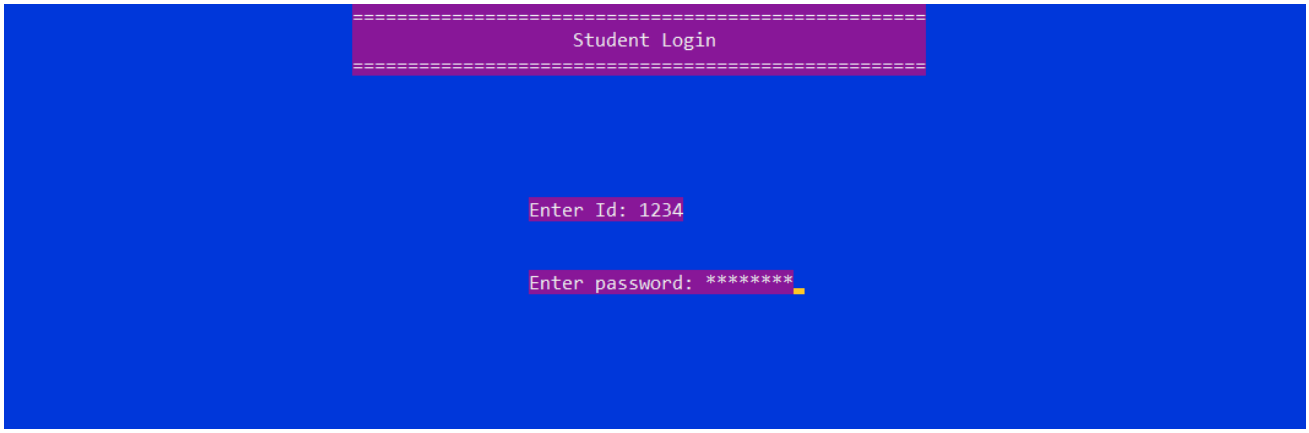
In the student portal, you are able to see the following options:



1. **Log in:** *Enter 1 to logging into the student portal.*
2. **Register:** *Enter 2 to registering in the student portal.*
3. **Return:** *Enter 3 to go back to the main menu.*

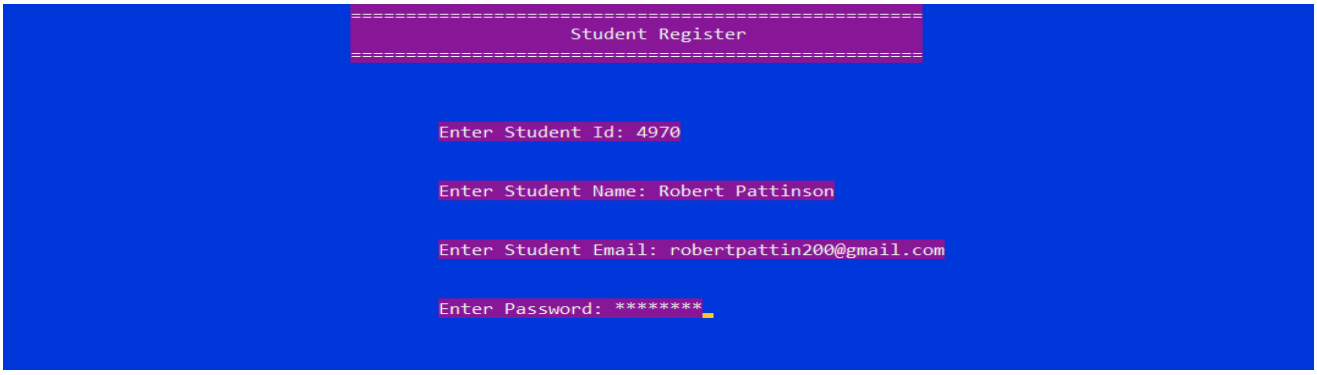
Log in

Upon entering '1' into the student portal, you will be prompted to input your ID and password. If the entered ID/password is invalid, the system will display an error message, and the system will prompt you to re-enter the information.



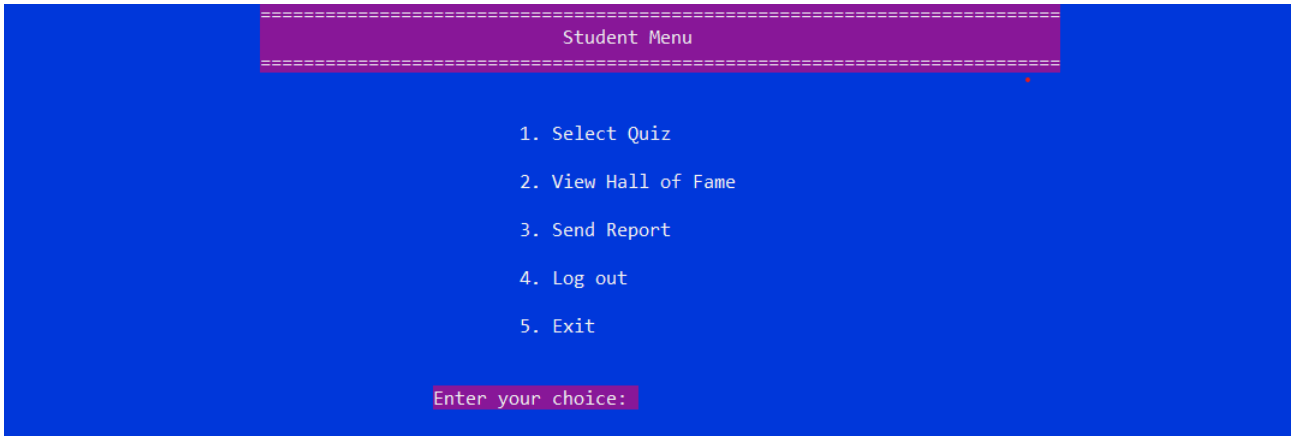
Register

If you are not already registered in the student portal, Enter 2 to register.



You will be prompted to enter your ID, name, email, and password to complete the registration process. If the ID is already registered, the system will display an error message and prompt you again. After successfully registering in the student portal, you will be able to log in successfully by providing your username and password.

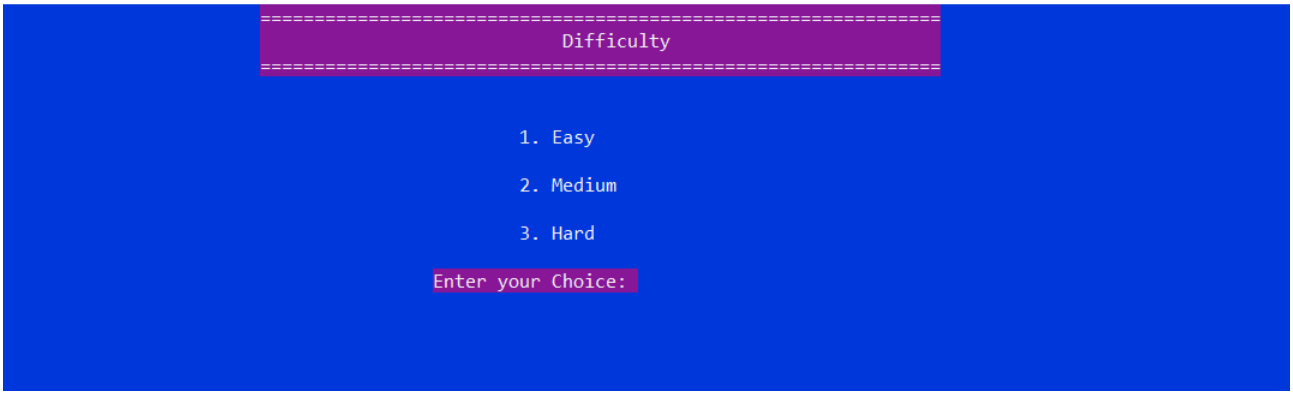
Student Menu



1. **Select Quiz:** *Enter 1 to begin to select quiz on any subject.*
2. **View Hall of Fame:** *Enter 2 to check scores of students in ascending order.*
3. **Send Reports:** *Enter 3 to submit reports for any problems encountered.*
4. **Log Out:** *Enter 4 to log out of the student portal.*
5. **Exit:** *Enter 5 to close the program*

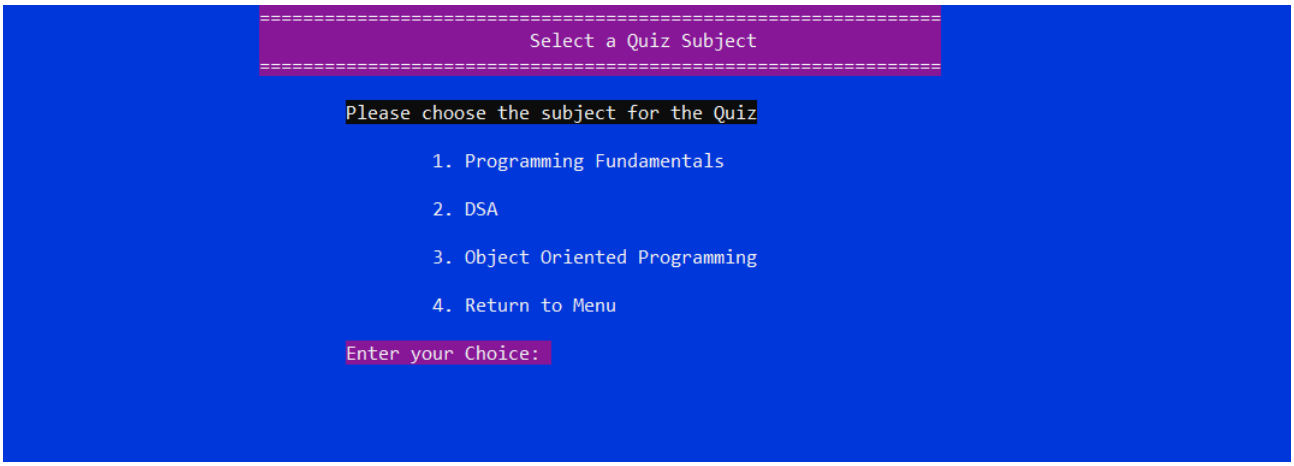
Difficulty Menu

Enter 1 allows users to "Select Quiz." students are prompted to choose a difficulty level for quiz.



In the difficulty menu, you must select a difficulty level Easy, Medium, or Hard to add a subject. The difficulty of the quiz is determined by the difficulty level of the subject you added.
Note: *The difficulty menu is mandatory in any case of subject/quiz edit menu.*

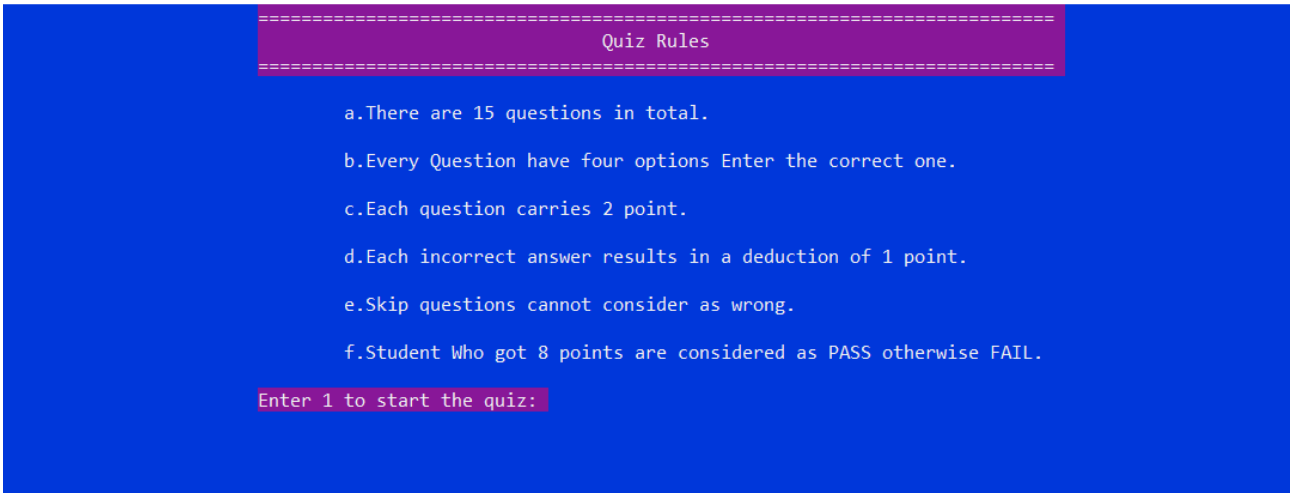
Select Quiz Subject



Enter 1 allows users to "Select Quiz." students are prompted to choose a difficulty and then subject from the list of available subjects. In the event that no subjects are present, the system will generate an error message. However, students are not left without recourse, they have the option to send a report to the admin, detailing the issue encountered. This feature ensures that any problems with the availability of subjects can be promptly addressed and resolved.

Quiz Rules

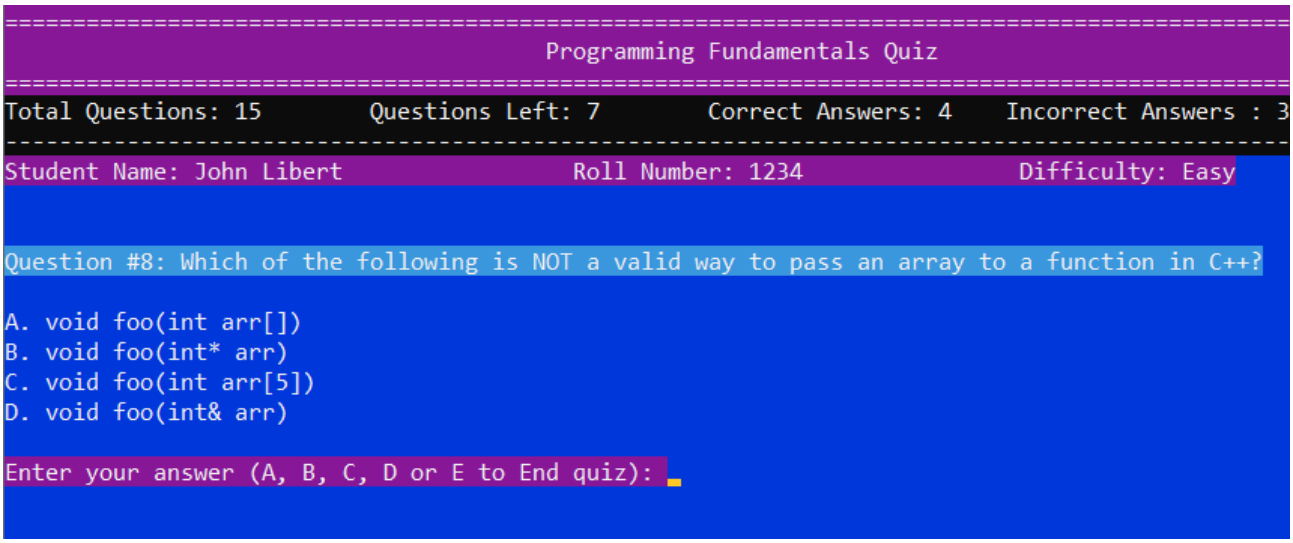
Before commencing the quiz, it is essential to familiarize yourself with the following rules. The player's progress is determined based on the passing marks set for students.



Start Quiz

If there is not enough quiz in the selected subject then system will show error and then student have option to send report to admin.

Each quiz consists of multiple-choice questions and quiz will appear in random order every time quiz starts. Read each question carefully and select the correct answer (A, B, C, D, or E).

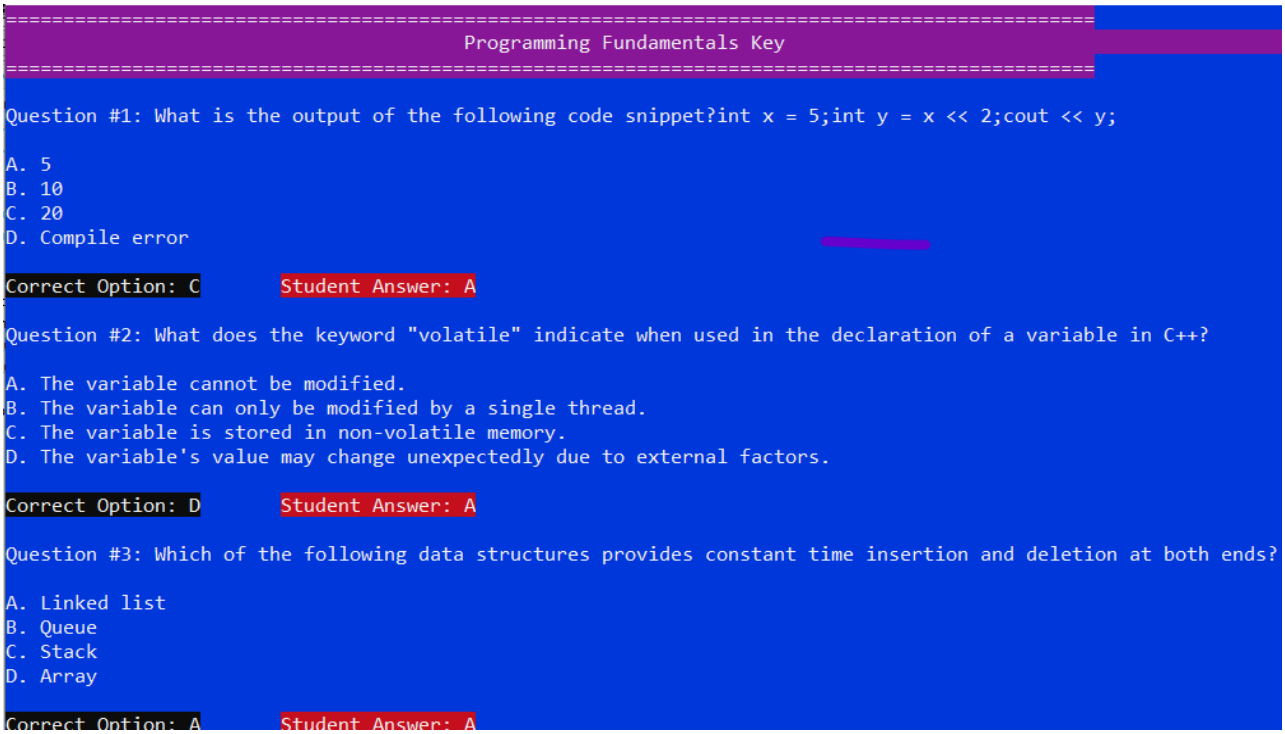


- *Enter E to End the Quiz.*
- *Enter the corresponding letter key to choose your answer.*
- *After selecting an answer, you will receive immediate feedback indicating whether your response was correct or incorrect.*
- *The quiz will continue with the next question until all questions are answered.*

At the end of the quiz, you will see the Key of the quiz and then receive a result card.

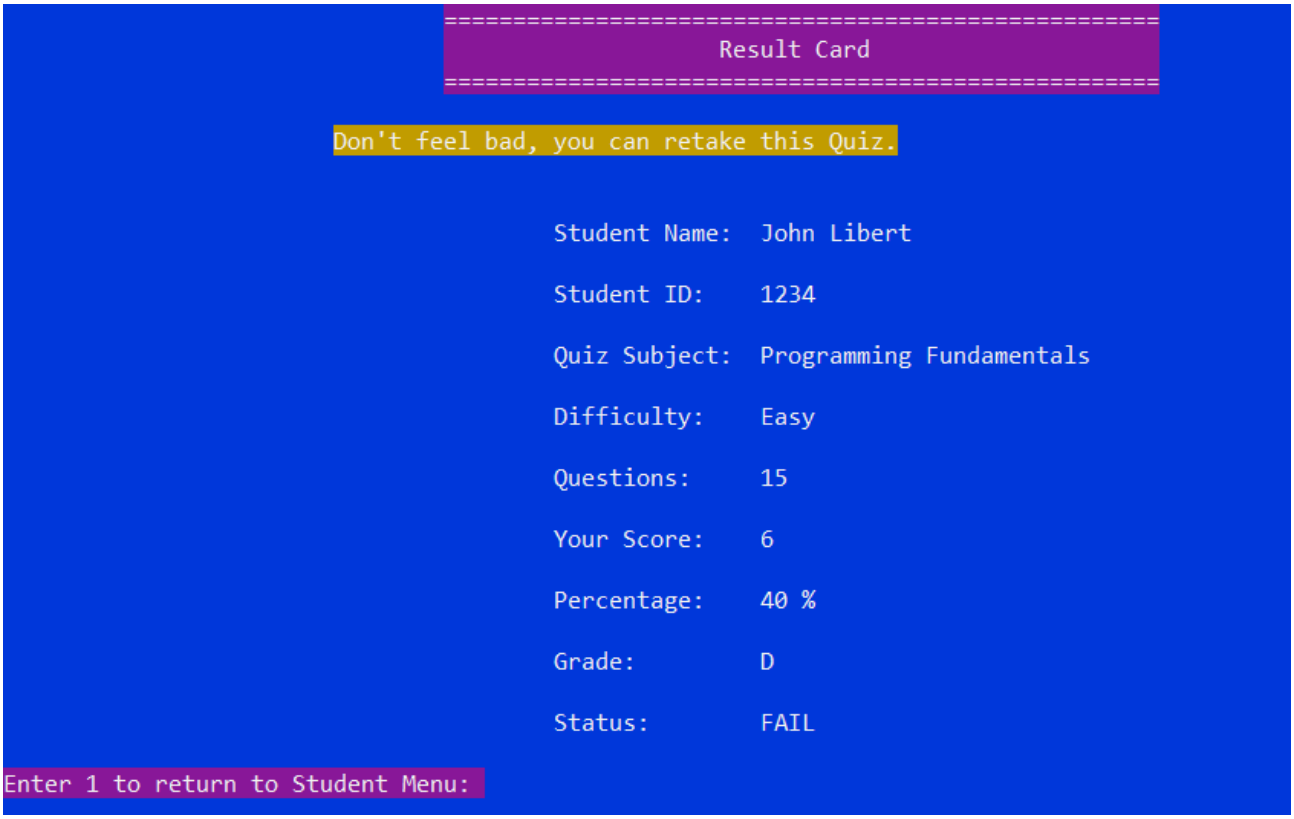
Quiz Key

After the quiz is complete, you will see the respective subject quiz key along with the correct answers as well as the user's responses.

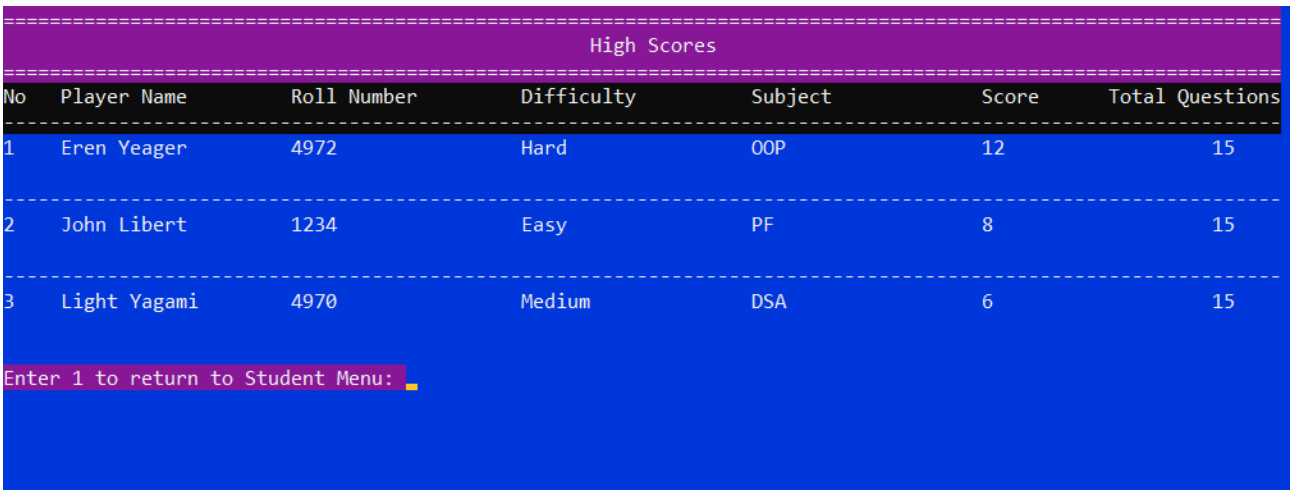


Result Card

The quiz result card will be displayed after completing of quiz

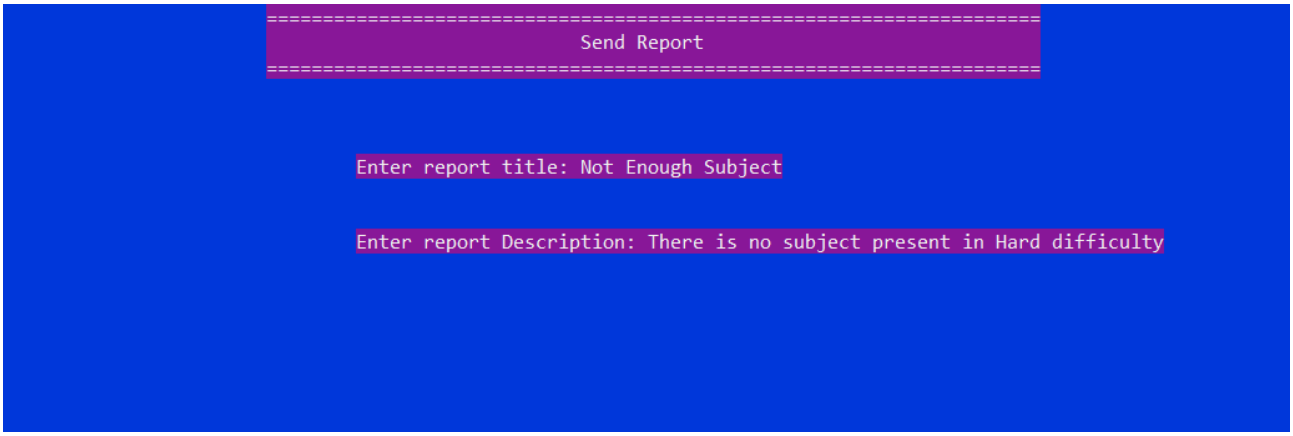


Hall of Fame



Select "High Scores" from the main menu to view the high scores of previous players. The high scores are displayed in ascending order based on the student's score. The display includes the Student name, subject, roll number, score, difficulty level, and total number of questions.

Send Report



In this option, you can submit reports regarding any issues encountered during the quiz. This enables you to discuss problems with the admin. Upon sending reports, the admin will review and approve the submitted reports. The student ID and name are automatically utilized as the reporter ID and name.

Log out

To exit the system, you need to log out. Press '5' in the student portal to log out and return to the main menu. From there, you have the option to either exit the system or enter the Student Portal.

4.2 Hardware Interfaces

The system will require computing hardware compatible with the Windows operating system.

4.3 Software Interfaces

The application relies on the Windows command-line interface for user interactions.it will use txt files as database.

4.4 Communications Interfaces

The application does not require external communication interfaces, as it operates within a standalone console environment.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The system should respond to user inputs promptly within the console environment. The application should efficiently process and display quiz questions, ensuring a seamless user experience.

5.2 Safety Requirements

The system should ensure the security of user data stored locally on the machine.

5.3 Security Requirements

The application should implement measures to prevent unauthorized access to quiz data and results stored on the local machine.

5.4 Software Quality Attributes

Reliability: *The system should function without errors, providing a stable experience for both instructors and students.*
Usability: *The console-based interface should be designed for ease of use, with clear prompts and instructions for users interacting via the command line.*