Code Complexities

Candidate number: 8446

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# **Register / Login**

## Validation / Customized Exceptions

When registering an account or editing an existing account, users must meet specific criteria for their username and password. The registration form includes validations to ensure usernames are at least 5 characters long and passwords are at least 7 characters, including at least one number. If the validations are not met on the register form the register button will remain disabled, until they are met. The register button remains disabled until these criteria are met. User guidance is provided through labels that turn green when criteria are met and red when not.

## Uploading Custom Avatars

A unique feature in this system is the ability to use custom avatars. Users can select from four provided avatars or upload their own from their file system, provided the image is in a valid file format (jpeg, png, webp, svg). This personalization enhances user engagement and allows for easier differentiation on the leaderboard.

# **Quiz Features**

## Randomization

One of the questions in my quiz is randomized meaning the user will not see the same question twice until all variations of the question are exhausted. Once all the questions have been exhausted a suitable message will appear notifying them that they may see repeated questions. Note that if you exit the game, or log out, this will reset all the questions and they will all be available again. This is a good feature as it makes the quiz feel less repetitive and enhances the replay ability aspect.

## Timer

Each question has a time limit. Answering before the halfway mark awards extra points, provided all the answers are correct. A time-out results in an automatic incorrect mark, and a message alerts the user that they ran out of time. This feature encourages quick thinking and allows users to improve their high scores by answering rapidly.

## Sound effects

The quiz is made more complex with an "Audio Manager" class used for background music and sound effects. Countdown music plays as the timer ticks down, creating a more intuitive and lively quiz experience.

## Leaderboard

The main menu displays a leaderboard of the top 5 players by total points. If fewer than 5 players exist, all players are displayed. This feature fosters a competitive environment and encourages continuous play. Post-quiz, a separate leaderboard displays rankings based on the selected quiz difficulty.

## Drag and drop – transfer mechanic

When the user places the images on their answer, usually they have to click ‘clear’ to restart the question, but that’s annoying, so even after you place the image on the answer you can drag it onto another answer location. It’ll then remove the image from its original positon and reset the picture box and will then transfer across the answer to the new location.

## Text entry – accepted inputs

When the submits their answer on the text entry question, all spaces (“ “) in their answer are removed, and their answer is converted to all lowercase, this modified answer is compared against the known correct answer. This allows a wider type of answers to be accepted.

## Save score prompt

If the quiz is active, and the user decides they want to leave or go to the main menu. A prompt will show alerting the user that their score and high score will not be saved. This alert is only shown if the user is active in the quiz, this is done as I believe score should not be saved unless the user completes the quiz.

## Smart picture boxes.

To ensure a consistent and visually appealing layout, I have implemented a smart positioning system for the Picture Boxes on the radio button question. This system calculates the necessary positional adjustment based on the Radio Button's text length. By measuring the text length and considering the font size, the system computes an offset value. This offset determines how far to shift the Picture Box either to the left or right. The result is that the feedback icon (tick or cross) in the Picture Box is always appropriately placed to the right of the Radio Button's text, maintaining a balanced and uncluttered interface regardless of the text length. This approach effectively addresses the issue of Text-Picture Box alignment, ensuring a flexible and responsive UI design.

# **Mini Game**

## Snake

The snake mini game is unlocked by reaching 30 points. The addition of the mini game provides the players with a reason to replay the quiz and strive for a better score and unlock the game.

# **Admin facility**

## Admin regeneration

It is essential that an administrator account is always accessible for management purposes in this quiz application. To ensure that the admin account is always present I have implemented a feature that will regenerate the players bin file if it is ever deleted. Whenever the player file is regenerated it will automatically remake the administrator account and insert it into the player bin file. This ensures there is always a way to access admin privileges for management of the quiz. The admin is granted all necessary points and high scores allowing them to do anything in the quiz.

## Admin players

The admin facility includes a player management page for viewing, editing, deleting, and creating player profiles. This feature simplifies player management and provides insights into quiz performance.

# Granting and revoking admin permissions.

Players with admin permissions can grant and revoke admin permissions to other players, this allows the workload of moderation to be dispersed. But under no circumstance can the main admin be changed, whether that be changing username or password or admin status.

## Admin questions

The question management page allows for the creation, editing, and deletion of radio button questions. New questions are immediately added to the quiz, keeping content fresh and engaging.

# **Child and parent forms.**

## Parent form side bar.

By utilizing the parent-child form structure, I not only streamlined data management and communication but also implemented a responsive sliding sidebar on the parent form. This dynamic sidebar adjusts its width, seamlessly pushing over the child forms loaded into the panel. The result is a visually appealing and user-friendly interface that allows for customization while maintaining smooth interaction between the parent form, sidebar, and child forms.

## The use of child forms.

Adopting the parent-child form structure proved advantageous in avoiding the need to repetitively pass player data between forms. If I had opted for typical movement between forms using "Form form = new MainMenu(currentPlayer)" for each transition, I would have faced the challenge of passing player data between every form explicitly. However, by storing the player data on the parent form, I eliminated this redundancy. When a child form, such as the summary screen, requires access to player data, I can effortlessly retrieve it by calling the parent form's data. This efficient communication between parent and child forms ensures that I can manipulate player data seamlessly, without the risk of data being lost on the currentPlayer.

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**Child and parent form way of referencing player data**