Software Requirements Specification

1. Introduction

1.1. Purpose

This document serves the purpose of delivering a comprehensive description of the Dyslexia Diagnosis and Educational Game System. It will explain the system's objectives, features, user interface, what the plan is built for, and how it will be constrained to operate and respond to external stimuli. This system aims to improve children's intelligence and help early diagnosis of dyslexia. This document aims for both the stakeholders and the developers of the system.

1.2. Scope of Project

The Dyslexia Diagnostic and Educational Game System is designed for children who are at least four years old with dyslexia. The system will be developed to provide parents with a practical and accessible tool for early diagnosis of dyslexia in their children, making this diagnosis very easy and inexpensive. The system will help educate dyslexic children about the disease through educational games (s). Essentially, the scheme aims to reduce the financial barriers associated with diagnosing dyslexia, improving the efficiency of the diagnostic process and reducing associated costs.

1.3. Glossary(Definitions, Acronyms, and Abbreviations)

2. General Description

2.1. System Environment

The "Dyslexia Diagnosis and Educational Game System" is designed for children aged four and above with dyslexia. The system also considers parental profiles. Its primary goal is to provide an effective and accessible tool for early dyslexia diagnosis, making the process easy and cost-effective. Additionally, the

system aids in alleviating dyslexia through educational games tailored for dyslexic children.

2.2. User Characteristics

The primary user base includes children aged four and above, focusing on those diagnosed with dyslexia. Additionally, parents are considered users for monitoring their children's progress within the system. An administrator with special privileges is also included to address user and system-related issues.

2.3. General Constraints and Assumptions

2.3.1. Constraints

- The system targets children aged four and above
- The games should be user-friendly and engaging for children.

2.3.2. Assumptions

- Users have access to a device with the necessary hardware capabilities.
- Users are familiar with basic interactive interfaces.
- Parents are responsible for overseeing and assisting their children's interaction with the system.

3. Specification Requirements

3.1. Interface Requirements

3.1.1. User Interface

Login Page: Includes fields for name, surname, email, age, and password, with a membership button.
Main Page: Two boxes leading to the game and diagnosis tabs, displaying child-friendly visuals.
Pop-up Agreement: This appears when selecting the diagnosis tab.
Game Interfaces: Include clear instructions, interactive elements, and age-appropriate graphics.

3.1.2. Hardware Interface

Compatible with devices commonly used by children, such as tablets or computers.

3.1.3. Software Interface

Responsive and adaptable software for different devices.
Admin interface for system management.

3.1.4. Communication Interface

Online communication for user login and data storage.

3.2. Functional Requirements

3.2.1. Diagnostic System
3.2.2. Diagnostic Games
3.2.3. Educational Games
3.2.4. Navigation
3.2.5. Accuracy Tracking
3.2.6. Admin Controls
3.2.7. Platform Compatibility
3.2.8. Responsive Design
3.2.9. Exit and Return
3.2.10. Efficiency and Cost Reduction

The system initially requires users to log in, featuring a membership button on the login page. Clicking the button opens a pop-up page, prompting users for their name, surname, email address, age, and password. This page also includes an informative agreement for users. Successfully logged-in users are directed to the main page, where two boxes lead to the game and diagnosis tabs. These boxes display child-friendly visuals previewing the content. The main page's background image is also child-friendly.

Upon selecting the diagnosis box, users encounter a pop-up agreement, and upon approval, they can access three diagnosis games consecutively. The first game, "Letter Matching Game," focuses on letter and word recognition, attention, concentration, and problem-solving skills. The game adapts to the user's age and skill level, tracking progress and providing feedback for an enjoyable learning experience.

Additional features may include measuring correct and incorrect matches over a period, utilizing graphs or charts to monitor progress, and enhancing the overall learning and development tracking capabilities.

Upon completing the first game, users are given two options: to continue with the second game or conclude the diagnosis. If the user opts to end the diagnosis, the system displays the calculated accuracy rate.

The second game, "Right-Left Matching," assesses users' understanding of right and left. It involves prompting users to click on the correct box ("right" or "left") based on the displayed object's position. The game includes functions for starting, asking questions, checking answers, and concluding, along with sample questions.

After completing the second game, users can proceed to the third game or conclude the diagnosis. The third game, "Symmetry Game," is designed for users aged four and above to predict the symmetry of objects presented as images.

3.3. Non-Functional Requirements

3.3.1. Log Data

User Data: Name, surname, email, age, password.
Game Data: Progress, scores, accuracy rates.

3.3.2. Performance

The system should respond to user interactions within a reasonable time frame, ensuring a smooth and responsive experience.

3.3.3. Scalability

The system should be designed to handle an increasing number of users and content without significant degradation in performance.

3.3.4. Reliability

The system should be stable and reliable, minimizing downtime and ensuring users can access the platform consistently.

3.3.5. Usability

The user interface should be intuitive, with clear navigation and easy-to-understand instructions, ensuring a positive and frustration-free user experience.

3.3.6. Accessibility

The system should adhere to accessibility standards to ensure that it is usable by individuals with different abilities, including those with visual, auditory, or motor impairments.

3.3.7. Security

Robust security measures should be implemented to protect user data and ensure the privacy and confidentiality of sensitive information.
Encrypted user data for privacy.
Secure login and authentication mechanisms.

Extra features:

In addition to these requirements, the system should have additional features like a help function explaining how to play and a restart option. The game graphics should be colorful and attractive, and the sound should be fun and motivating.

After completing the third game, the system presents a Results page, including a Score Table with details such as the game name, type, objective, score, speed, and accuracy. The accuracy is calculated using the formula: Accuracy = (Number of correct answers / Total number of questions) * 100.

Upon displaying the score table, users are redirected to the homepage, where the game tab is open for users selecting a game (though the game itself is yet to be designed).

3.3.8. Compatibility:

The system should be compatible with a range of devices, browsers, and operating systems, enabling users to access it from various platforms.

3.3.9. Maintainability

The system should be designed in a way that facilitates easy maintenance, updates, and future enhancements.

3.3.10. Interoperability

The system should be able to integrate with other educational platforms, tools, or systems that may be used by schools, educators, or parents.

3.3.11. Regulatory Compliance

The system should adhere to relevant laws, regulations, and standards governing educational software and user data protection.

3.3.12. Performance Monitoring

Implement tools for monitoring system performance, allowing administrators to identify and address potential issues proactively.

3.3.13. Feedback Mechanism

Establish a feedback mechanism for users to report issues, provide suggestions, or seek assistance, ensuring continuous improvement based on user input.

3.3.14. Data Backup and Recovery

Regularly back up user data and implement a robust recovery plan to protect against data loss and system failures.

3.3.15. Training and Support

Provide training materials and support resources for users, educators, and administrators to facilitate effective use of the system.

3.3.16. Ethical Considerations

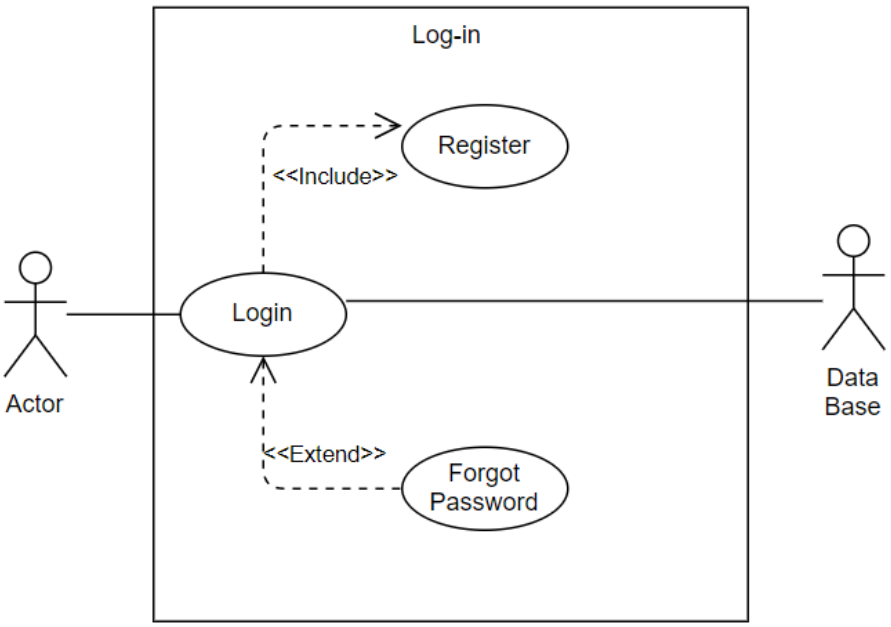
The system should be designed and operated ethically, considering the well-being and rights of the users, particularly children.

4. Analysis- UML

4.1. Use Cases

4.1.1. SYSTEM USE CASE

4.1.2. Login Page Use Case



Use Case Number	UC-1
Use Case Name	Login Page
Actor	User, Database
Description	The user logs into the application using their email and password. If the password entered is incorrect, the user is redirected to the Forgot Password page. If the user is not registered, they are prompted to go to the Register page.
Precondition	The user must have the application open and be on the login page.
Scenario	1. The user opens the application and is presented with a login page. 2. They enter their email and password. If the login attempt fails, they can reset their password. 3. If they are a new user, to register.
Postcondition	The user successfully logs into the application and is directed to the Main Page, or the user begins the password reset process, or the user is directed to the registration page.
Exceptions	Possible exceptions include entering an incorrect password, a failed login attempt due to a system error, or trying to log in with an email that is not registered.
Related Use Cases	UC-2, UC-3

Use Case Number	UC-2
Use Case Name	Register
Actor	User, Database
Description	The user goes through the registration process to create a new account, which includes providing personal details and setting up login credentials.
Precondition	The user has launched the application and chosen to register a new account.
Scenario	1. Upon choosing to register, the user is prompted to enter the necessary information (name, surname, email, password). 2. The information is submitted to the application for account creation.
Postcondition	If the registration is successful, the user is taken to the Login Page.
Exceptions	The registration process might not be successful if the user provides invalid details, if an account with the provided email already exists, or if there's an error in the system during the registration process.
Related Use Cases	UC-1

Use Case Number	UC-3
Use Case Name	Forgot Password
Actor	User, Database
Description	The user initiates a password reset process to regain access to their account.
Precondition	The user must be on the Login page and have already tried to log in or selected the "Forgot Password" option directly.
Scenario	1. The user selects "Forgot Password". 2. Input their email address. 3. Follow the steps provided, which typically include receiving a password reset link via email. 4. Create a new password and confirm the change.
Postcondition	The user has successfully reset their password and is automatically redirected to the Login page.
Exceptions	Potential exceptions include the system not recognizing the email address. The user not being able to access their email account. Or a system error preventing the password reset process from completing successfully.
Related Use Cases	UC-1

4.1.3. Main Page Use Case

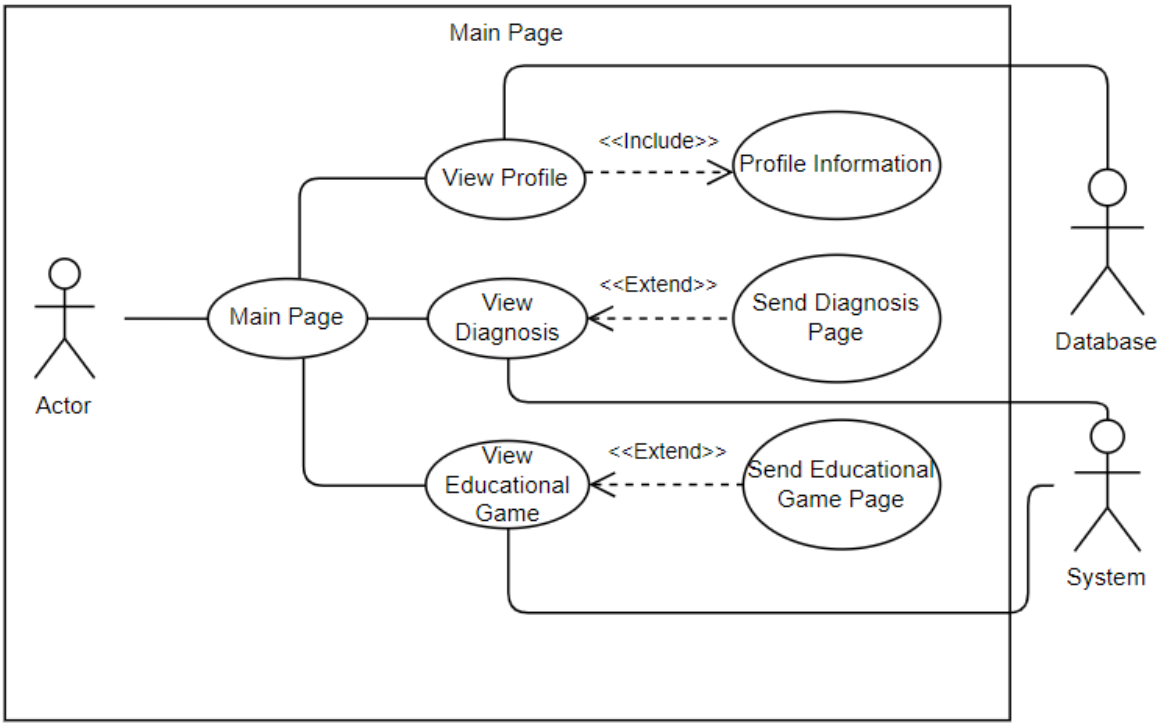


Figure 1: Main Page

Use Case Number	UC-4
Use Case Name	Main Page
Actor	User, System
Description	The user views the main page of the application to access the profile, diagnosis, and games. (The user accesses the Main Page to navigate to Profile, Diagnosis, or Educational Games.)
Precondition	The user must be logged in to access the Main Page.
Scenario	1. After the user logs in, the user is presented with the Main Page. 2. User can choose to view their profile, access the diagnostic tool, or select educational games designed to help with dyslexia. 3. The selected page is displayed.
Postcondition	The user successfully navigates to one of the three options and is engaged with the selected functionality.
Exceptions	Errors may occur if the user is not logged in or if a system error prevents the Main Page from displaying correctly. Additionally, an error will prompt if the user attempts to access the diagnostic tool or educational games without proper permissions.
Related Use Cases	UC-5, UC-6, UC-7

Use Case Number	UC-5
Use Case Name	View Profile
Actor	User, Database
Description	The user has the ability to view their profile within the application. This typically includes personal information, diagnostic results, and any other relevant data stored in the profile.
Precondition	The user must be logged into the application and located on the Main Page.
Scenario	1. The user selects "View Profile". 2. Retrieves and displays the system's profile information.
Postcondition:	The user's profile information is readable and presented to him/her in an orderly manner.
Exceptions	Warn when profile information cannot be accessed or there is an error retrieving profile data from the database
Related Use Cases	UC-4

Use Case Number	UC-6
Use Case Name	View Diagnosis
Actor	User, System
Description	It directs the user to the main diagnostic page within the application, making it easier to access diagnostic information. The diagnostic page can provide preliminary diagnostic results, historical data, and recommendations based on the user's specific preliminary diagnosis of dyslexia.
Precondition	The user must be logged in and present on the Main Page of the application.
Scenario	1. The user selects the "Preliminary diagnosis" option on the Home Page. 2. The system directs them to the main diagnosis page, where they can see detailed information about the dyslexia diagnosis and start testing.
Postcondition	The user is redirected to the diagnostic page, where he can interact with the diagnostic information, better understand his condition, and access relevant functionalities or recommendations provided by the application.
Exceptions	If there is a problem navigating the system or the diagnostic page fails to load, it will issue an error to try again.
Related Use Cases	UC-4

Use Case Number	UC-7
Use Case Name	View Educational Games
Actor	User
Description	Allows the user to access the application's Educational Games from the Home Page. It is the first stage in the process of a user navigating games designed to help dyslexia.
Precondition	The user must be logged in and present on the Main Page of the application.
Scenario	1. The user clicks on "View Educational Game" on the Home Page. 2. The system directs the user to the Educational Games Home page.
Postcondition	The user comes to the Educational Game section and can browse, select, and interact with the available games.
Exceptions	The Educational Games section cannot be accessed due to system problems or an error that occurs when loading game content.
Related Use Cases	UC-4

4.1.4. Diagnosis Page Use Case

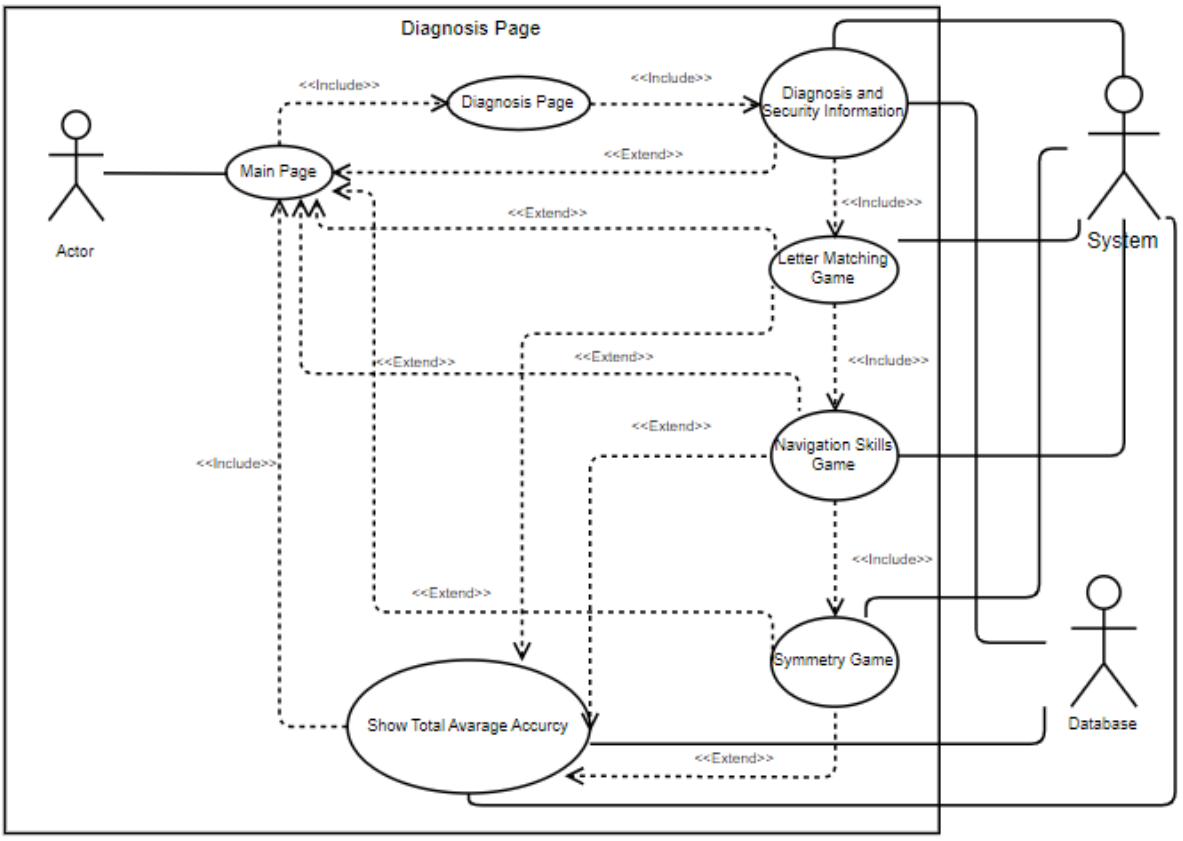


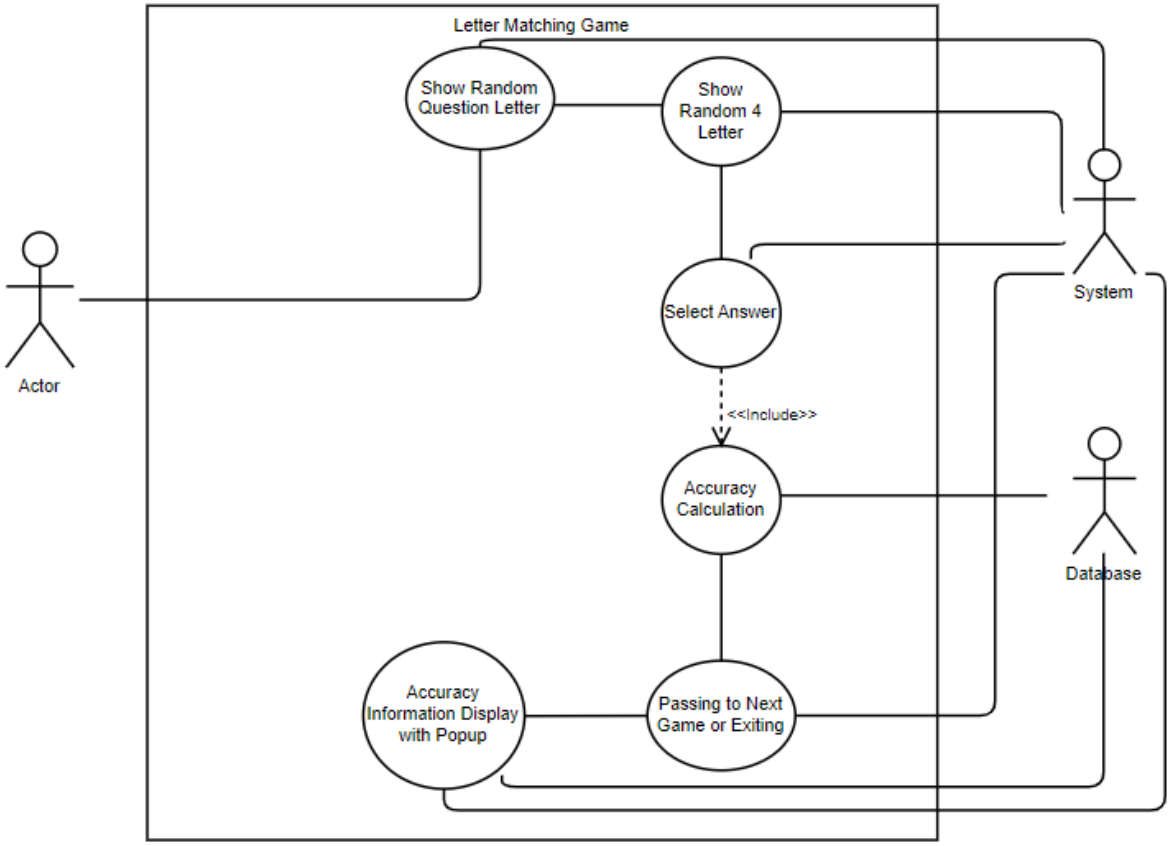
Figure 2: Diagnosis Page

Use Case Number	UC-8
Use Case Name	Diagnosis Page
Actor	User
Description	The user uses the main page to access the diagnosis page. The user can access the diagnosis and security information page on the diagnosis page. The user clicks “ Start Diagnosis” and then starts playing the first Diagnosis game. After each game is completed, the user's total accuracy average is calculated and displayed.
Precondition	The user must be logged in to access the Main Page.
Scenario	1. The user navigates to the diagnosis page from the main page. 2. The diagnosis page is displayed, showing information about the user's diagnosis. 3. The user navigates to the diagnosis and security information page. 4. The diagnosis and security information page is displayed. 5. The user starts the first game. 6. The game is launched. 7. The game is completed. 8. Accuracy is calculated and displayed.
Postcondition	The user receives their total average accuracy after completing all games and can navigate back to the Main Page.
Exceptions	If a game is not completed, or if there is an error in displaying accuracy, the user may not receive the total average accuracy.
Related Use Cases	Main Page, Letter Matching Game, Navigation Skills Game, Symmetry Game

Use Case Number	UC-9
Use Case Name	Diagnosis and Security Information
Actor	User, System, Database
Description	The User reaches the Diagnostics Page after selecting "View Diagnostics" on the Home Page. This page provides information about the preliminary diagnostic test and data security and provides a start button to start the test or an exit option to return to the Main Page.
Precondition	The user must be logged in and access the Main Page. Must have clicked the View Diagnosis button on the Main Page
Scenario	1. The user selects “View Diagnostics”. 2. Show information and options to start or exit the test.
Postcondition	The user either starts the diagnostic test or returns to the Main Page.
Exceptions	The user may decide not to continue testing.
Related Use Cases	UC-4, UC-11

Use Case Number	UC-10
Use Case Name	Show Total Accuracy and Information
Actor	User, System, Database
Description	After completing the third game, the user is automatically directed to the information page where the overall average accuracy and a preliminary diagnosis based on percentage accuracy are provided.
Precondition	The user may have completed the Letter Matching game and finished the test. The user may have completed the first two games(Letter Matching and Navigation Skills) and finished the test. The user may have completed all three games (Letter Matching, Navigation Skills, and Symmetry Game).
Scenario	1. The user presses the finish test button. 2. The user is given the Total Accuracy Average and Information. 3. When the user clicks exit, the user returns to the Main menu.
Postcondition	The user receives the overall average accuracy and preliminary diagnosis with the option to return to the Home Page.
Exceptions	The user may exit the game before the second and third game is completed.
Related Use Cases	UC-4

4.1.4.1. Letter Matching Game Use Case

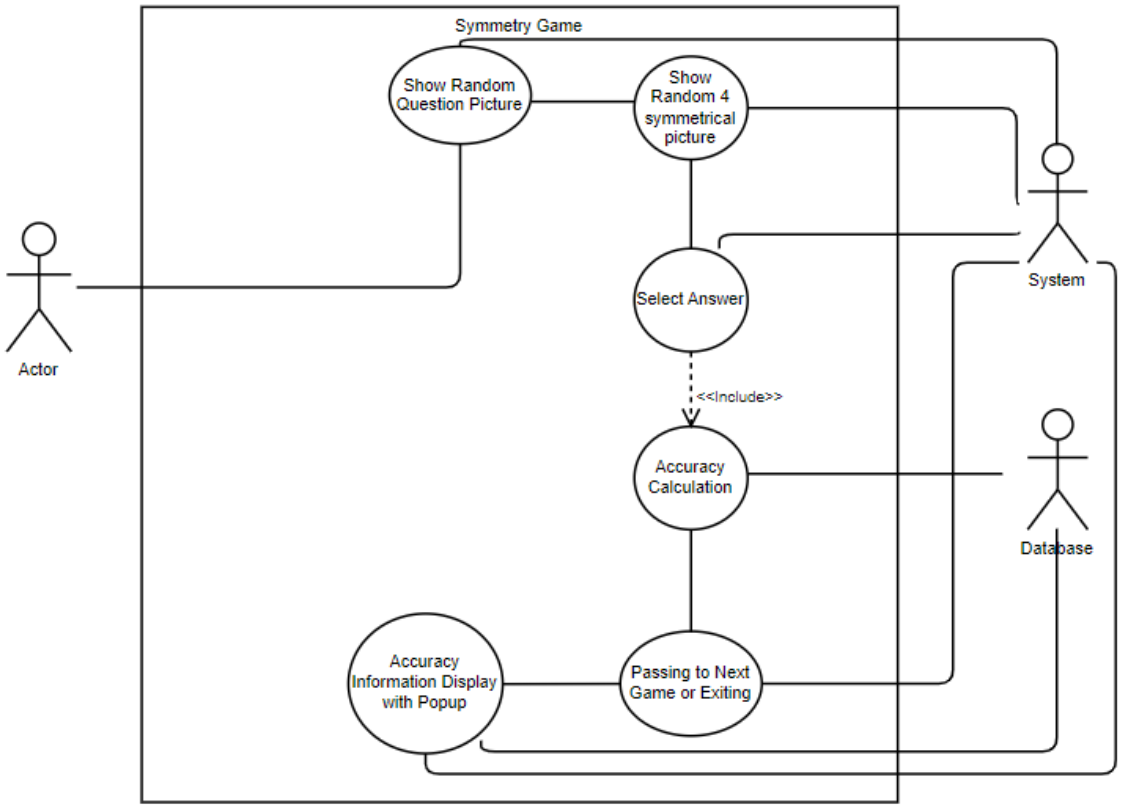


Use Case Number	UC-11
Use Case Name	Letter Matching game
Actor	Actor, System, Database
Description	The user enters a game where they are shown a random letter and must choose the correct match from four options. Accuracy is calculated after all game options have been completed. The user can then choose to move on to the next games or view total accuracy average information and exit the Main Page.
Precondition	The user has the option to start this game “In Diagnosis Page” after completing the diagnosis information stage.
Scenario	1. The user starts the game. 2. Makes a choice for each letter shown and completes the game.
Postcondition	After completing the game, users can choose to proceed to the next game (Navigation Skills Game) or view detailed accuracy information and return to the Main Page.
Exceptions	The user can choose to exit at any time. The user will receive an Error message if there is a technical issue affecting the game.
Related Use Cases	UC-4, UC-10, UC-12

4.1.4.2. Navigation Skills Game Use Case

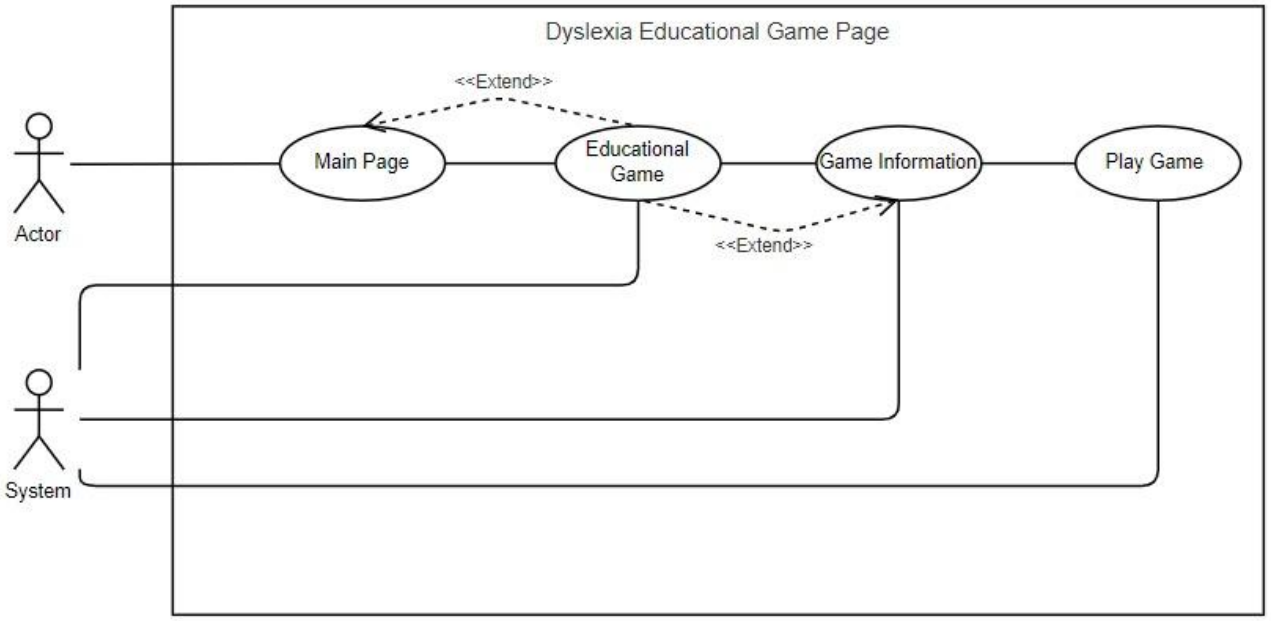
Use Case Number	UC-12
Use Case Name	Navigation Skills Game
Actor	
Description	
Precondition	
Scenario	
Postcondition	
Exceptions	
Related Use Cases	

4.1.4.3. Symmetry Game Use Case



Use Case Number	UC-13
Use Case Name	Symmetry Game
Actor	Actor, System, Database
Description	The user will try to find the correct symmetrical half to match the picture box provided at the top of the screen, in one of the 4 options given below.
Precondition	The user must log in to the system and play the 1st and 2nd games.
Scenario	1. Symmetry Game displays a picture box at the top of the screen. 2. Four random image boxes appear at the bottom of the screen. 3. The User selects one of four options. 4. The system checks whether the selected option is the correct symmetrical match. 5. After the game is finished, it directs you to the total accuracy and information page.
Postcondition	After the game is completed view detailed accuracy information and return to the Main Page.
Exceptions	The user can choose to exit at any time. The user will receive an Error message if there is a technical issue affecting the game.
Related Use Cases	UC-4, UC-10

5. Educational Game Page Use Case

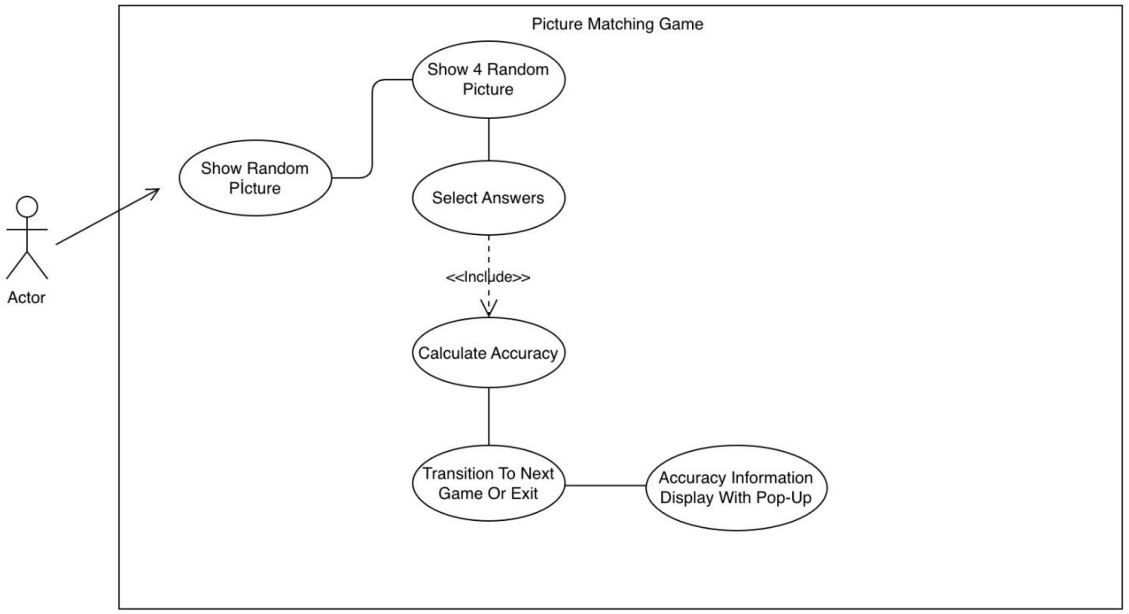


Use Case Number	UC-14
Use Case Name	Educational Game
Actor	Actor, System
Description	After the child user logs in to the system, he goes to the game section and chooses the game he will play. Before the game starts, an informative window opens and the user must agree to start the game.
Precondition	The user must log in to the system and be directed to the home page.
Scenario	1. The user logs into the system 2. The user clicks on the game box 3. The user selects a game 4. The user will be presented with an information page before entering the game. 5. If the user accepts, the system starts the game; if the user rejects it, it returns to the game selection. 6. If the user clicks the exit button, he returns to the home page.
Postcondition	The user is either playing a game browsing the game selection, or returning to the home page.
Exceptions	If the user tries to go to the game section without logging in, they will be asked to log in.
Related Use Cases	UC-1, UC-14, UC-15

Use Case Number	UC-15
Use Case Name	Game Information
Actor	Actor, System
Description	This page explains how to play the selected game, provides rules and objectives, and offers a "Start Game" button to start the game or an "Exit" button to return to the previous page.
Precondition	The user has gone to the Educational Game section and selected a specific game to explore.
Scenario	1. The user selects a game. 2. The Game Information page opens. 3. The user is informed about the instructions and rules of the game. 4. He decides to start playing by clicking the "Start Game" button or to return to the Educational Game list by clicking the "Exit" button.
Postcondition	The user either starts playing the game or returns to the list of educational games to select a different option.
Exceptions	An error occurs if there is a system failure that prevents the Game Information page from displaying correctly or if certain game information is not available for any reason.
Related Use Cases	UC-14, UC-16

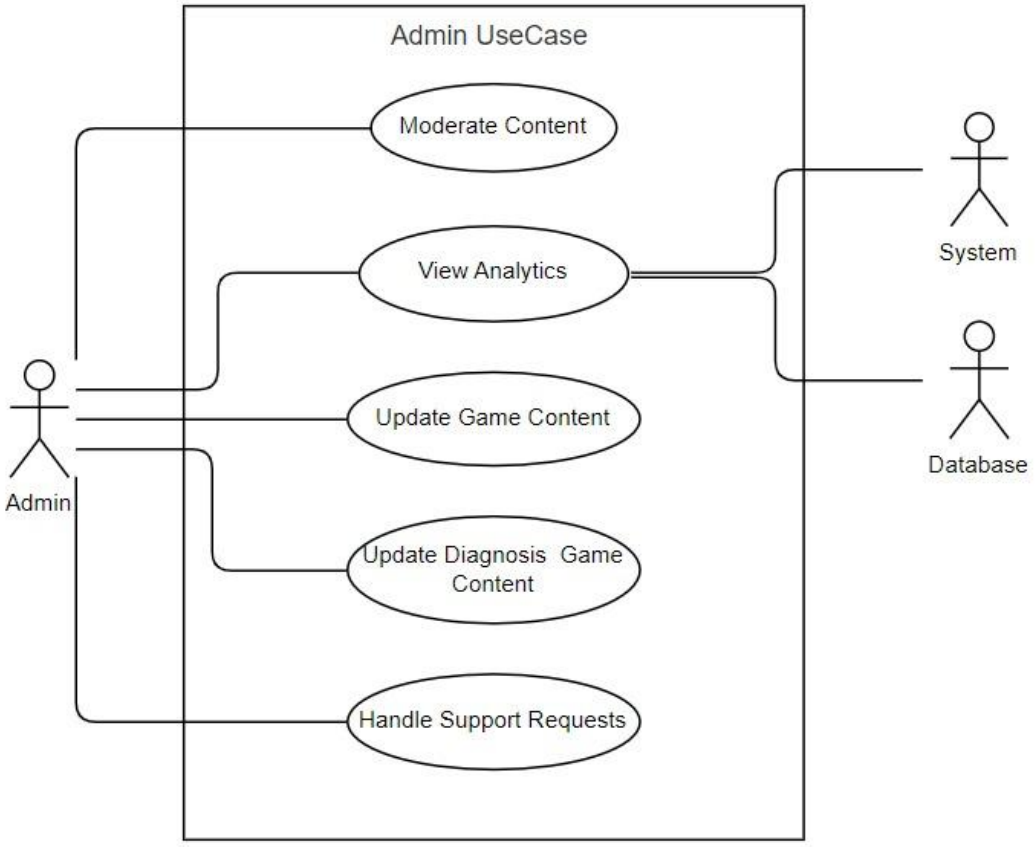
5.1. Play Game Use Case

5.1.1. Picture Matching Use Case



Use Case Number	UC-16
Use Case Name	Picture Matching Game
Actor	Actor
Description	The User plays a game where they must match a random picture with one of four options presented, aiming to improve memory and recognition skills.
Precondition	On the educational game page, you need to select the game and press the start button.
Scenario	1. Shows a random image to the user. 2. The system displays four random images as possible matches. 3. The system gives the user 3 wrong rights. If the user chooses 3 wrong options, the game ends or the restart button is activated. 4. The user selects the image they believe matches the original. 5. The system checks if it is correct. 6. If the user reaches the number of correct answers determined by the system, the game can move on to the next level or exit.
Postcondition	The user receives feedback on their choice and chooses to continue or exit another game.
Exceptions	The user may want to quit while in the game or may receive an error while in the game.
Related Use Cases	-

6. Admins Use Case



Use Case Number	UC-17
Use Case Name	Admin’s Main Page
Actor	Admin, System, Database
Description	This use case encompasses all the activities an Admin can perform on the main page of the system, including content moderation, analytics review, game content updates, diagnosis game content updates, and handling support requests.
Precondition	Admin must be authenticated and authorized to access the main admin page and its functions.
Scenario	Admin logs into the system with admin credentials. The system directs the Admin to the main page dashboard. Admin chooses an activity from the dashboard: Moderate Content, View Analytics, Update Game Content, Update Diagnosis Game Content, or Handle Support Requests. Admin completes the chosen activity using the system's tools and interfaces. The system processes the changes or updates made by the Admin. The system updates the Admin with the status of the activity and logs the action. Admin logs out or chooses another activity.
Postcondition	The system reflects any changes or updates made by the Admin, maintaining data integrity and ensuring that all user interactions are logged.
Exceptions	If the Admin attempts an unauthorized activity, the system restricts access and logs the attempt. If there is a system error during any activity, the system notifies the Admin and logs the error. If incorrect data is submitted, the system rejects the changes and requests the Admin to correct the data.
Related Use Cases	All specific use cases under the Admin main page (Moderate Content, View Analytics, Update Game Content, Update Diagnosis Game Content, Handle Support Requests) are interrelated as part of the Admin's responsibilities.

Use Case Number	UC-18
Use Case Name	Moderate Content
Actor	Admin
Description	The administrator monitors and moderates user-generated content to maintain community standards.
Precondition	Admin is authenticated and has the necessary permissions.
Scenario	1. The administrator reviews user submissions. 2. Flags or remove inappropriate content. 3. It warns users when necessary. 4. Communicate problems to the legal team when necessary.
Postcondition	Game content is safe and complies with community guidelines
Exceptions	Failure to detect some types of inappropriate content, user disputes.
Related Use Cases	UC-20

Use Case Number	UC-19
Use Case Name	View Analytics
Actor	Admin, Database
Description	Admin reviews game analytics to make informed decisions about game updates and community management.
Precondition	Analytics tools are operational and accessible. Admin is authenticated and has the necessary permissions.
Scenario	1. Admin logs into analytics dashboard. 2. Select desired metrics 3. Interprets data patterns and trends. 4. Generates reports for stakeholders.
Postcondition	Admin has the information needed for decision-making.
Exceptions	Analytics tools down, data corruption.
Related Use Cases	UC-18, UC-20

Use Case Number	UC-20
Use Case Name	Update Game Content
Actor	Admin
Description	The Admin updates the game's content to provide new features, bug fixes, or enhancements to the players.
Precondition	Admin is authenticated and has the necessary permissions.
Scenario	1. Admin logs into the admin portal. 2. Select the content update section. 3. Uploads new game assets or edits existing ones. 4. Submits changes for review. 5. Publish the updates to the game.
Postcondition	Game content is successfully updated.
Exceptions	Upload fails, incorrect file format, unauthorized changes.
Related Use Cases	UC-18, UC-19

Use Case Number	UC-21
Use Case Name	Update Diagnosis Game Content
Actor	Admin
Description	Admin updates diagnostic tools and scripts in the game to ensure proper functioning and to fix any identified issues.
Precondition	Admin has logged in with sufficient privileges.
Scenario	Admin accesses the diagnostics section. Reviews current diagnostic tools and scripts. Implements updates or corrections. Tests the updated diagnostics. Deploys updates to the production environment.
Postcondition	Diagnostic tools are up to date.
Exceptions	Diagnostics fail, updates are not compatible.
Related Use Cases	Handle Support Requests.

Use Case Number	UC-22
Use Case Name	Handle Support Request
Actor	Admin
Description	
Precondition	
Scenario	
Postcondition	
Exceptions	
Related Use Cases	