SMARTY KIDS HUB

Author Details:
1. Vadiraj H V – 3VC21IS055, Dept. of ISE, RYMEC, Ballari
2. Shri Raksha – 3VC21IS047, Dept. of ISE, RYMEC, Ballari
3. C Joyson Rony – 3VC21IS007, Dept. of ISE, RYMEC, Ballari
4. Pavan Reddy K H – 3VC21IS036, Dept. of ISE, RYMEC, Ballari

Guide: Dr. B. Sreepathi, HOD, Dept. of ISE, RYMEC, Ballari

ABSTRACT

Smarty Kids Hub is a new educational website designed to help children learn more effectively. By allowing kids to register and take an initial assessment, the platform tailors lessons and activities to their individual knowledge levels. This personalized approach ensures that each child receives the right resources and support to enhance their learning experience and make studying more engaging and effective.

Chapter 1:
Introduction

Smarty Kids Hub is an innovative educational platform designed to offer a personalized learning experience for children. By integrating a registration and login system, the website assesses each child's knowledge level through an initial test, allowing it to tailor content to their specific needs. This personalized approach addresses the limitations of traditional one-size- fits-all educational websites, ensuring that children receive resources that match their learning pace and level. By providing customized lessons and activities, Smarty Kids Hub aims to make learning more engaging and effective, enhancing the educational journey for each child.

Chapter 2:
Vision & Mission Of Project Work

1. Vision:

To empower every child with personalized learning experiences that ignite curiosity, foster growth, and unlock their full potential.

2. Mission:

To create an engaging and adaptive educational platform that customizes learning paths for each child, making education enjoyable and effective.
To support diverse learning needs, promote lifelong learning, and help children thrive in their academic journey.

Chapter 3:

Literature Survey

Title of the Research article	Author Name	Name of Journal	Features
"Service Delivery in the Healthcare and Educational Systems for Children Following Traumatic Brain Injury"	Juliet Haarbauer-Krupa et al.	Journal of Head Trauma Rehabilitation, ISSN: 0885-9701, Vol. 39, Issue: 6, November- December 2024, pp-467-478	Target Audience: Focus on children across various learning levels
"Service Delivery in the Healthcare and Educational Systems for Children Following Traumatic Brain Injury"	Juliet Haarbauer-Krupa et al.	Journal of Head Trauma Rehabilitation, ISSN: 0885-9701, Vol. 39, Issue: 6, November- December 2024, pp-467-478	Scalability: Designed to scale easily and accommodate a growing number of users
"SLOW LEARNERS: Their Psychology and Educational Programmes"	Sangeeta Chauhan	International Journal of Multidisciplinary Research, ISSN: 2231-5780, Vol. 1, Issue: 8, December 2011, pp-34-45	Target Audience: Focus on children across various learning levels
"SLOW LEARNERS: Their Psychology and Educational Programmes"	Sangeeta Chauhan	International Journal of Multidisciplinary Research, ISSN: 2231-5780, Vol. 1, Issue: 8, December 2011, pp-34-45	Educational Game Design: Incorporates educational games to make learning fun and engaging.
"Human Ecological Systems and Multiple Intelligence of Slow Learning Adolescents"	Sheela Sangwan & Krishna Duhan	Asian Journal of Dairy and Food Research, ISSN: 0973-6598, Vol. 29, Issue: 3, July-September 2024, pp-216-221	Parental Involvement: Provides tools for parents to track and support their child's progress

"Human Ecological Systems and Multiple Intelligence of Slow Learning Adolescents"	Sheela Sangwan & Krishna Duhan	Asian Journal of Dairy and Food Research, ISSN: 0973-6598, Vol. 29, Issue: 3, July-September 2024, pp-216-221	Customizable Learning Environment: Allows customization of learning methods based on student preferences and needs.
"National Systems of Innovations are 'x-Efficient' (and x-Effective): Why Some Are Slow Learners"	Jorge Niosi	Research Policy, ISSN: 0048-7333, Vol.31, Issue: 2, February 2002, pp-291-302	Gamification: Implements gamification techniques to enhance engagement
"SLOW LEARNERS – A universal problem and providing Educational opportunities them to be aSuccessful Learner"	Appaji Korikana	PEOPLE: International Journal of Social Sciences, ISSN: 2454-5899, Vol.6, Issue: 1, 2020, pp-29-42	Focus on Emotional Support: Includes features to support the emotional well- being of students through motivational feedback and encouragement
"Social Selection in Educational Systems in Europe"	Walter Müller, Wolfgang Karle	European Sociological Review, ISSN: 0266-7215, Vol.9, Issue: 1, May 1993, pp-1–23	Quiz-Based Classif ication: Uses quizzes to classify students and determine their learning levels

Chapter 4:

PROBLEM STATEMENT

To Design and develop a dynamic and effective learning environment Smarty Kids Hub software system that address the challenges of delivering a truly personalized learning experience of each child's current knowledge level using python programming language.

Chapter 5:

Objectives

1. To design the system architecture to support up to 100 active users simultaneously, ensuring seamless performance without issues.
2. To implement secure user and admin login systems, with features like email verification, password confirmation, and appropriate redirection for authenticated users.
3. To provide tools for administrators, including a user addition mechanism, a user count display feature, and an admin contact page for efficient management and communication.
4. To develop user-facing functionalities, such as mark entry, quiz result submission with real-time validation, and a personalized status view page to enhance the user experience.

Chapter 6:

Scope of the Project

1. User Capacity:

- The system should support up to 100 active users simultaneously.
- Consideration: Ensure that database design can handle this volume of concurrent users without performance degradation.

2. Data Storage:

- Each user's data, including progress, quiz results, and course history, should be stored efficiently. The system should support up to 100 GB of data storage initially, with scalability options for expansion.
- Consideration: Implement a scalable database storage solution to handle growing data needs.

3. Number of Courses:

- The platform should support up to at least 2 courses, each with multiple modules and interactive elements.
- Consideration: Design the course management system to accommodate a large number of courses and easily integrate new content.

4. Age Limit:

- The system shall support for the age 11 – 13.
- Consideration: Ensure that the system handles that Age group.

Chapter 7:

Software & Hardware Requirement

1. Software Requirements

- Operating System: Windows, macOS, Linux (for server environment) iOS, Android (for mobile applications)
- Database Management System: MySQL for storing user data, content, and progress records.
- Programming Languages:
- Frontend: HTML, CSS, JavaScript
- Backend: Python (Flask)

2. Hardware Requirements

- Server Hardware:
- Adequate processing power (multi-core CPUs)
- Sufficient RAM (minimum 16 GB recommended for medium to large-scale operations)
- Client Hardware: Desktops, laptops, tablets, or smartphones for user access Minimum requirements for client devices:
- Processor: Dual-core
- RAM: 2 GB
- Storage: 4 GB of free space

Chapter 8:
System Design

8.1 Context-Free Diagram:

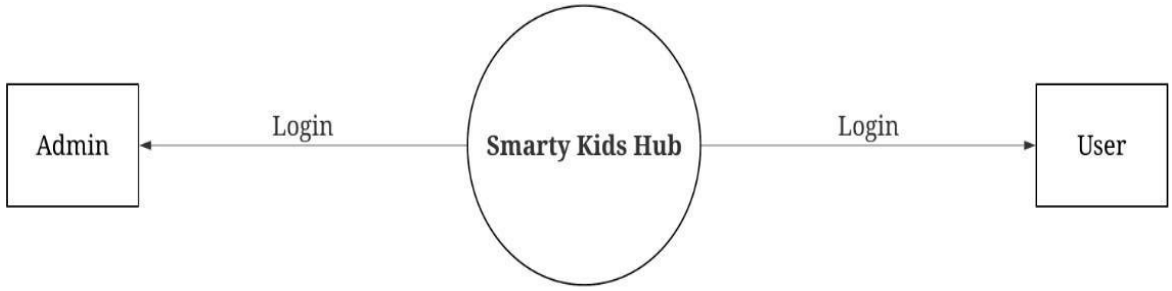

Fig 8.1.1: Level 1 Context-Free Diagram

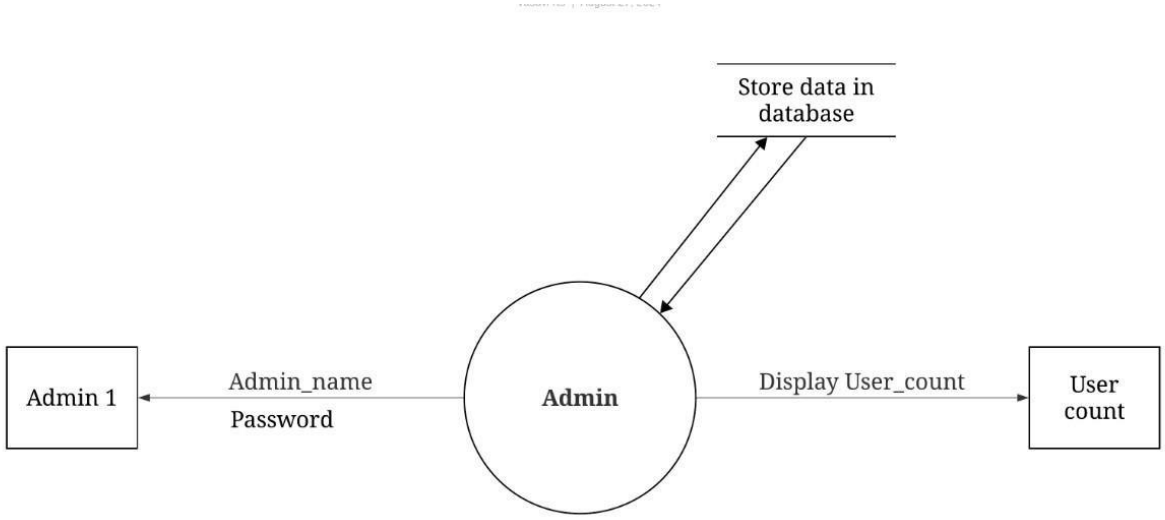

Fig 8.1.2: Level 2 Context-Free Diagram

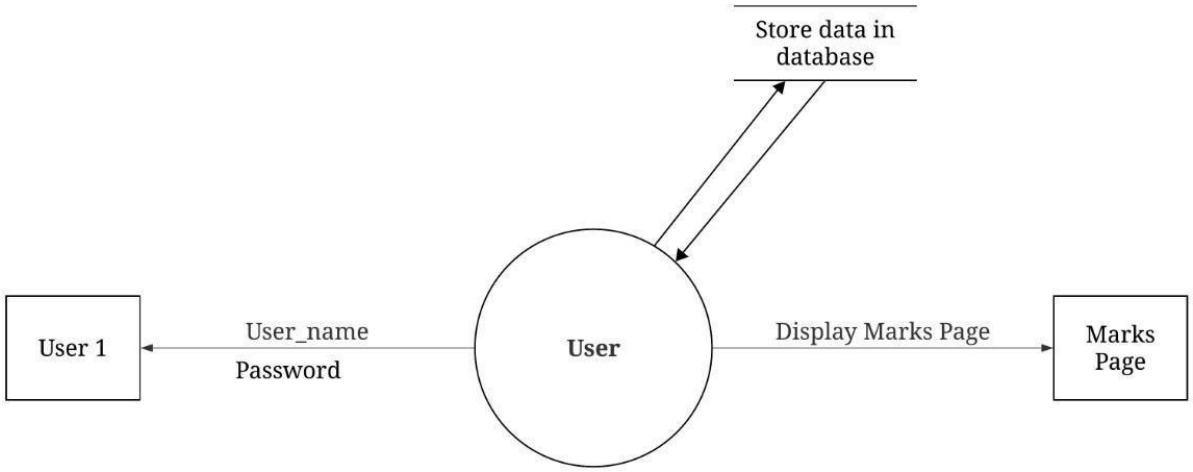

Fig 8.1.3: Level 3 Context-Free Diagram

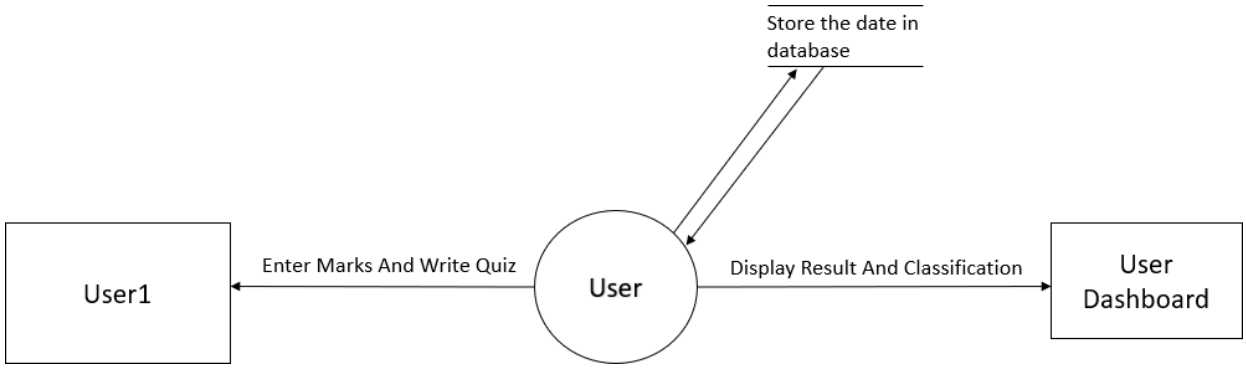

Fig 8.1.4: Level 4 Context-Free Diagram

8.2 Data-Flow Diagram:

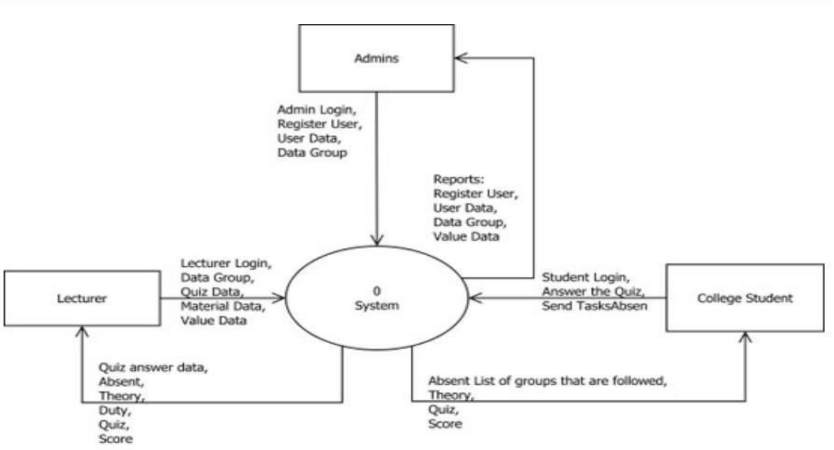

Fig 8.2: Data-Flow Diagram

8.3 Use Case Diagram:

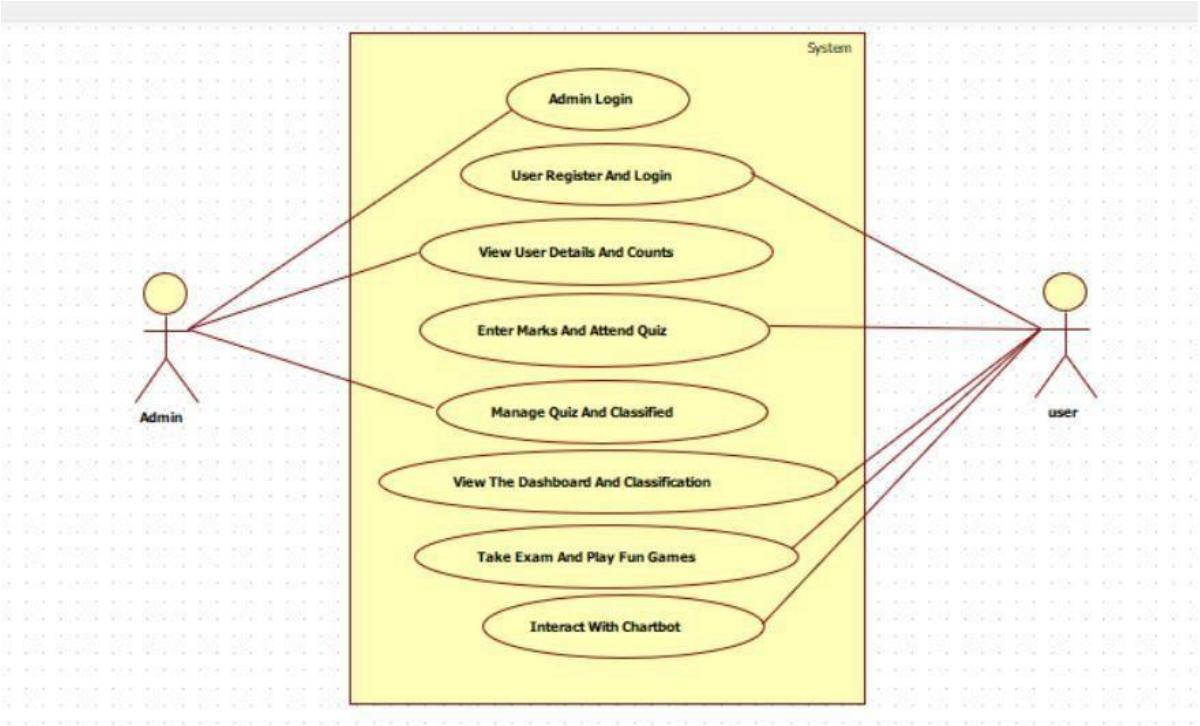

Fig 8.3: Use – Case Diagram

8.4 Sequence Diagram

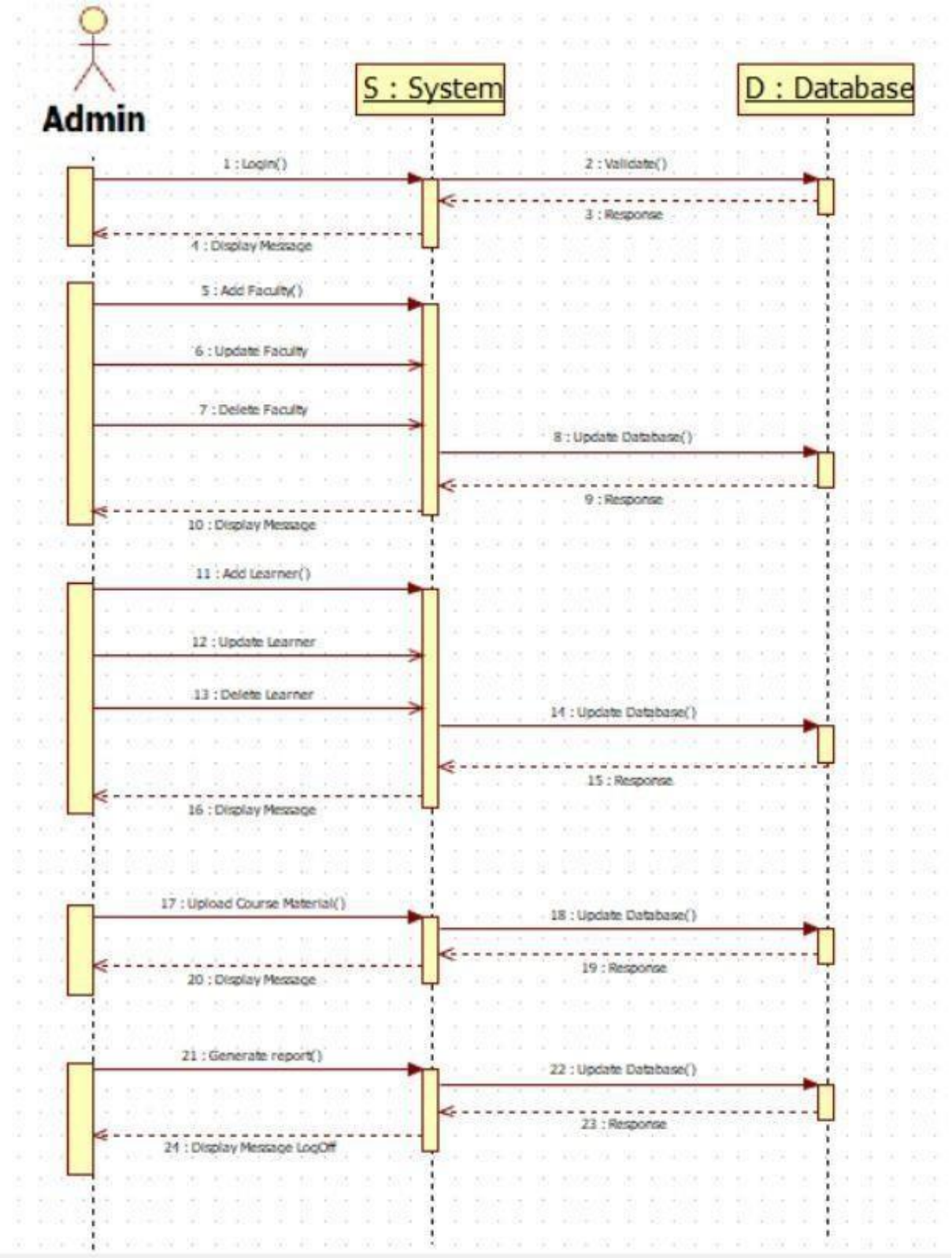

Fig 8.4.1: Sequence Diagram for Admin

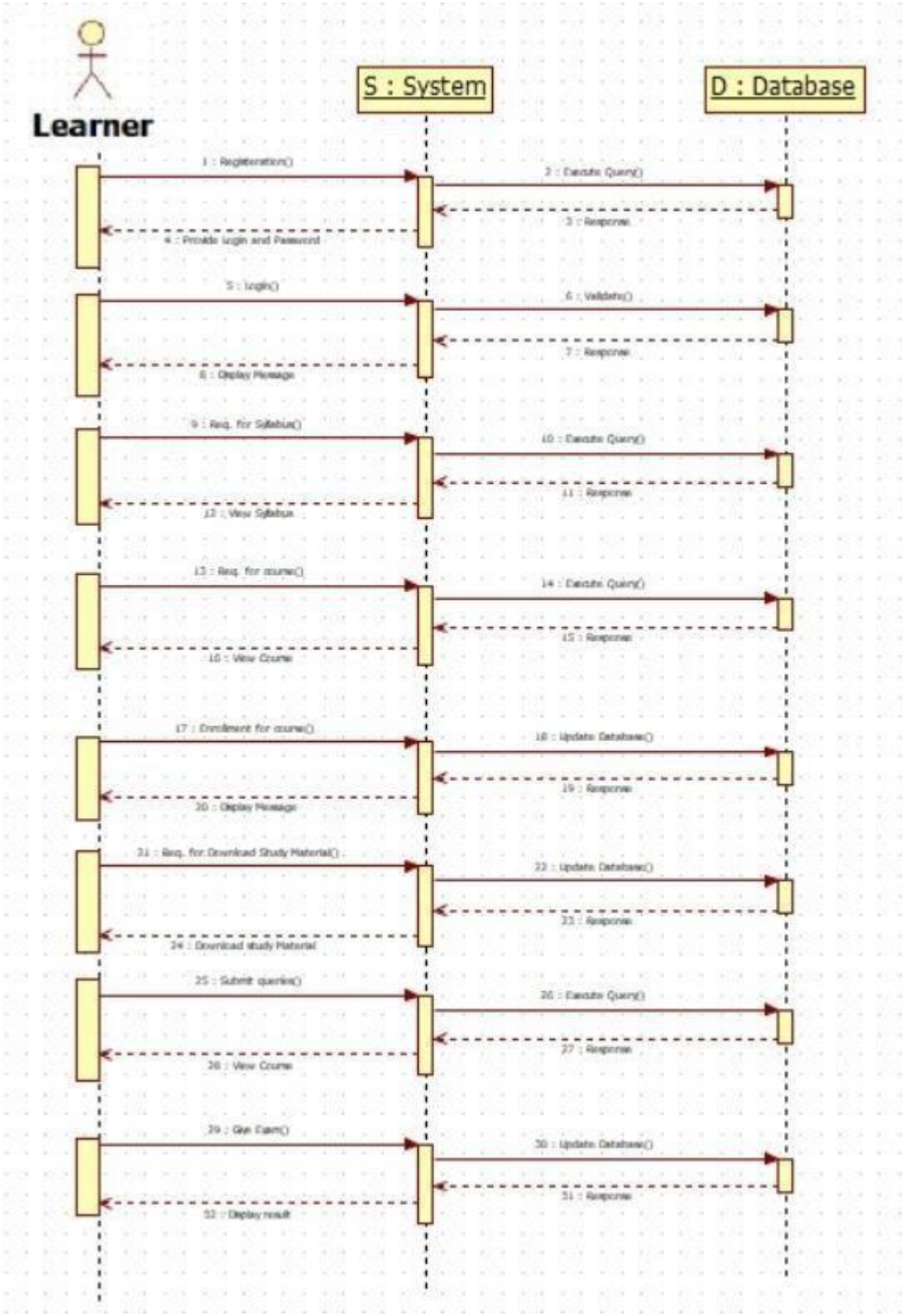

Fig 8.4.2: Sequence Diagram for Learner

Chapter 9:

Implementation

1. Main Page

Function Prototype:

def main ():

Description:

The `main` function handles the root URL (`/`) of the application. It renders the main homepage using the `main.html` template. This page serves as the entry point for users visiting the site.

2. Contact Page

Function Prototype:

def admin_contact ():

Description:

The `admin_contact` function renders the admin contact page when the `/admin_contact` URL is accessed. It uses the `admin_contact.html` template to display contact information for administrators.

3. Admin Login Page

Function Prototype:

def login ():

Description:

The `login` function renders the admin login page using the `login.html` template. This page allows administrators to access secure areas of the application by providing their credentials.

4. User Sign-Up Function Prototype:

def user_signup ():

Description:

The `user_signup` function renders the user registration page at the `/user_signup` URL using the `user_signup.html` template. It supports both GET and POST requests, facilitating new user registration.

5. User Login

Function Prototype:
def user_login ():

Description:

The `user_login` function manages the user login process. It accepts both GET and POST requests at the `/user_login` URL. For POST requests, it validates user credentials using the `check_login` method. Successful logins redirect users to
`enter_marks` or `status_view`, depending on their existing data. Invalid attempts trigger a flash message indicating incorrect credentials.

6. Add User

Function Prototype:
def add ():

Description:

The `add` function processes new user registration at the `/add_user` URL via POST requests. It validates input data, ensuring email uniqueness and password confirmation. If successful, it adds the user to the database and redirects them to the login page.

7. Enter Marks

Function Prototype:
def enter_marks (user_id):

Description:
The `enter_marks` function allows users to enter their third and fourth-grade marks. It handles both GET and POST requests for the `/enter_marks/<user_id>` URL. Marks are updated in the database via the `update_marks` method, and users are then redirected to the quiz page.

8. Submit Results

Function Prototype:
def submit_results ():

Description:
The `submit_results` function updates quiz results in the database. It handles POST requests at the `/submit_results` URL. Data is received in JSON format, validated, and updated in the database, with a JSON response indicating success or failure.

9. Count Details

Function Prototype:
def count_details():

Description:
The `count_details` function retrieves and displays the total number of users in the application. It renders the `count_details.html` template with the user count, accessed at the `/count_details` URL.

10. Status View

Function Prototype:
def status_view(user_id):

Description:
The `status_view` function displays a user's status, including their name, accessed via the `/status_view/<user_id>` URL. If the user is logged in, it renders the `status_view.html` template. Otherwise, it redirects to the login page.

11. Run Application

Function Prototype:
if _name_____== '_main_': app.run (debug=True)

Description:
This code block runs the Flask application in debug mode. It provides detailed error messages and auto-reloads the application during development.

Chapter 10:
Results and Discussions

10.1: Screenshots of Output:

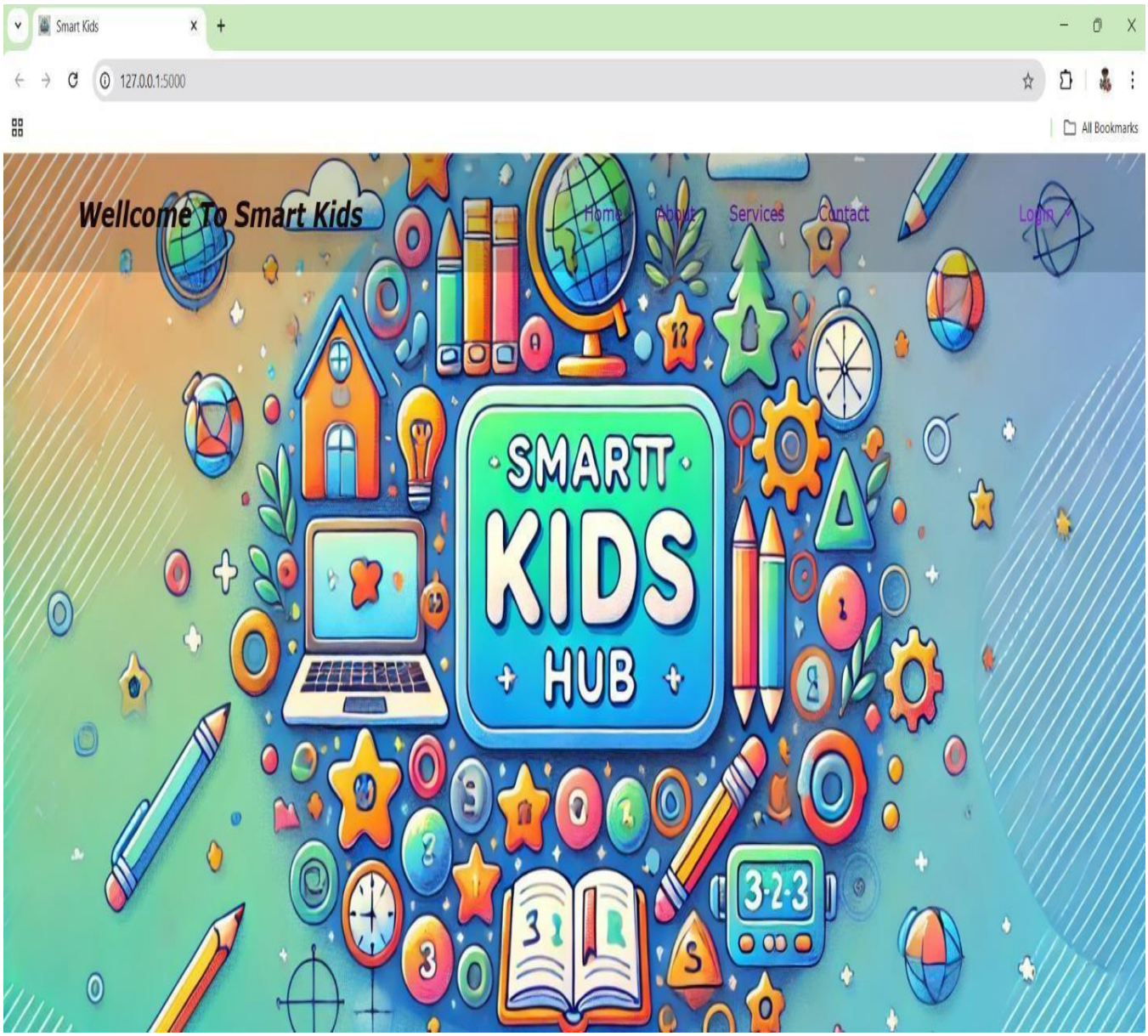

Fig 10.1.1: Main Page : The `main` function handles the root URL (`/`) of the application.

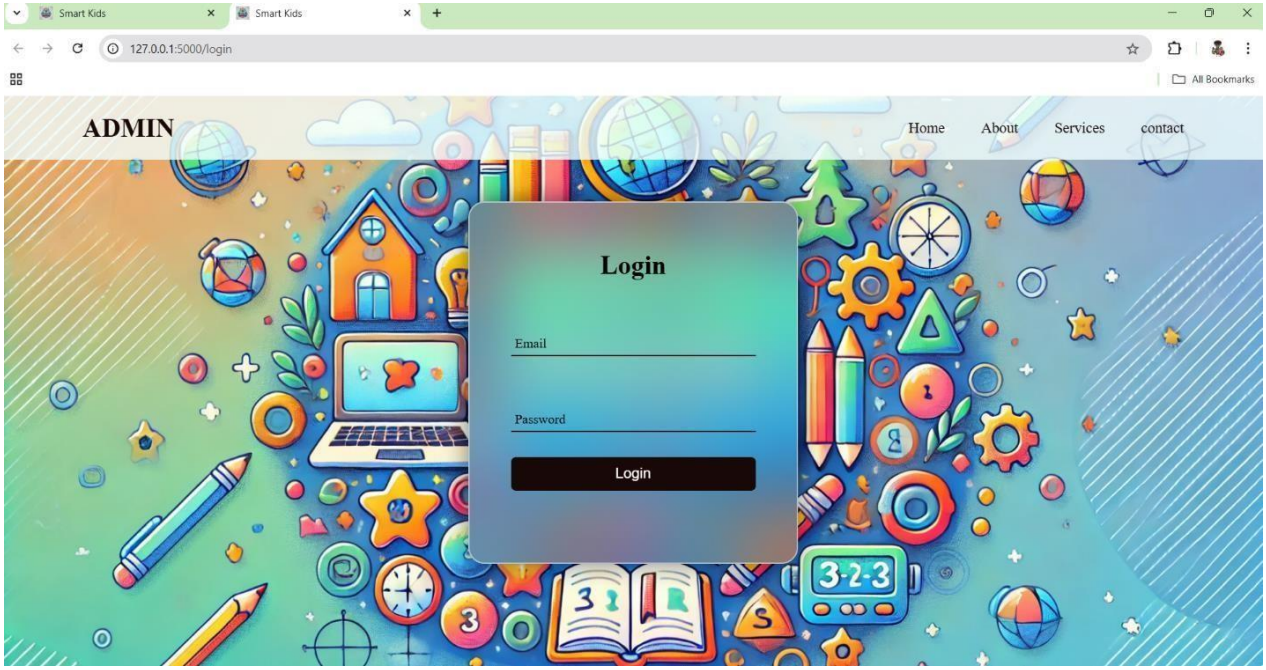

Fig 10.1.3: Admin Login Page: The `login` function renders the admin login page using the `login.html` template.

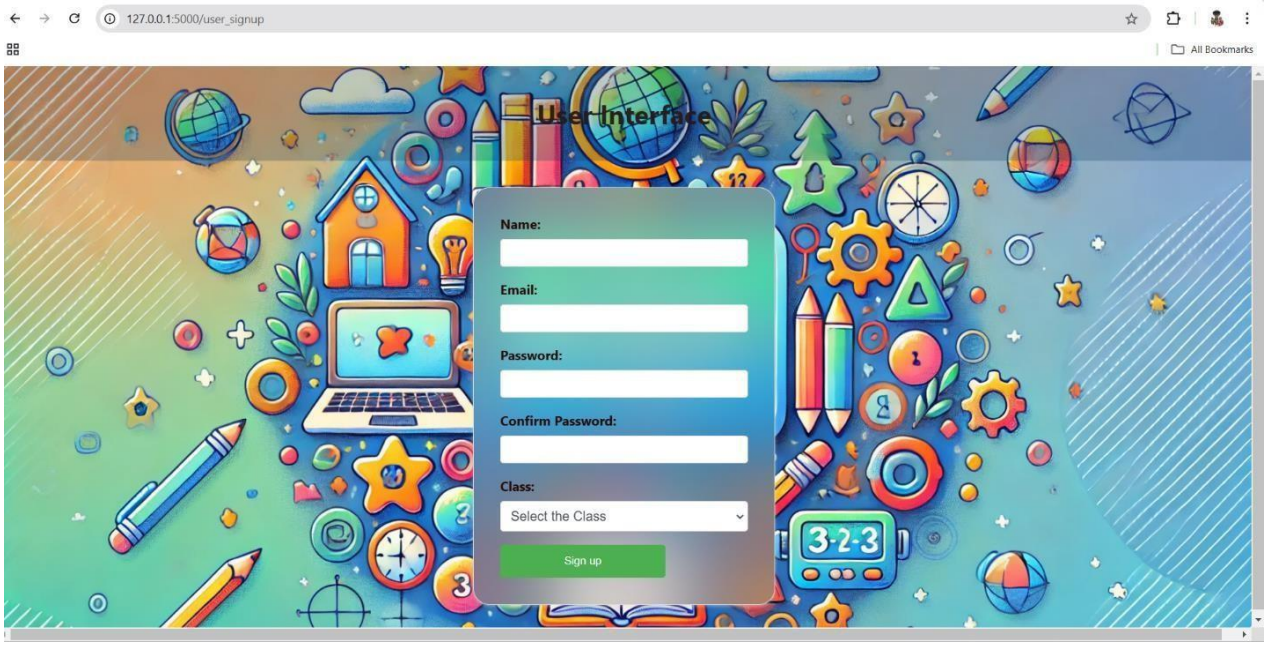

Fig 10.1.4: User Signup Page: The `user_signup` function renders the user registration page at the `/user_signup` URL using the `user_signup.html` template.

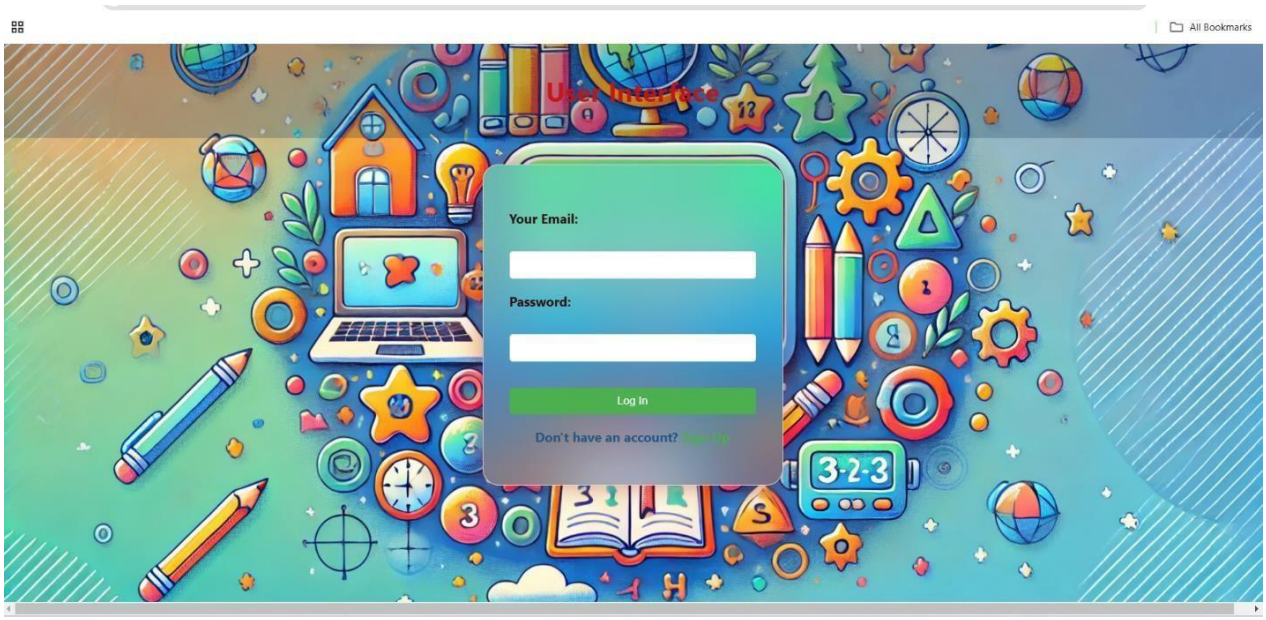

Fig 10.1.5: User Login Page: The `user_login` function manages the user login process. It accepts both GET and POST requests at the `/user_login` URL.

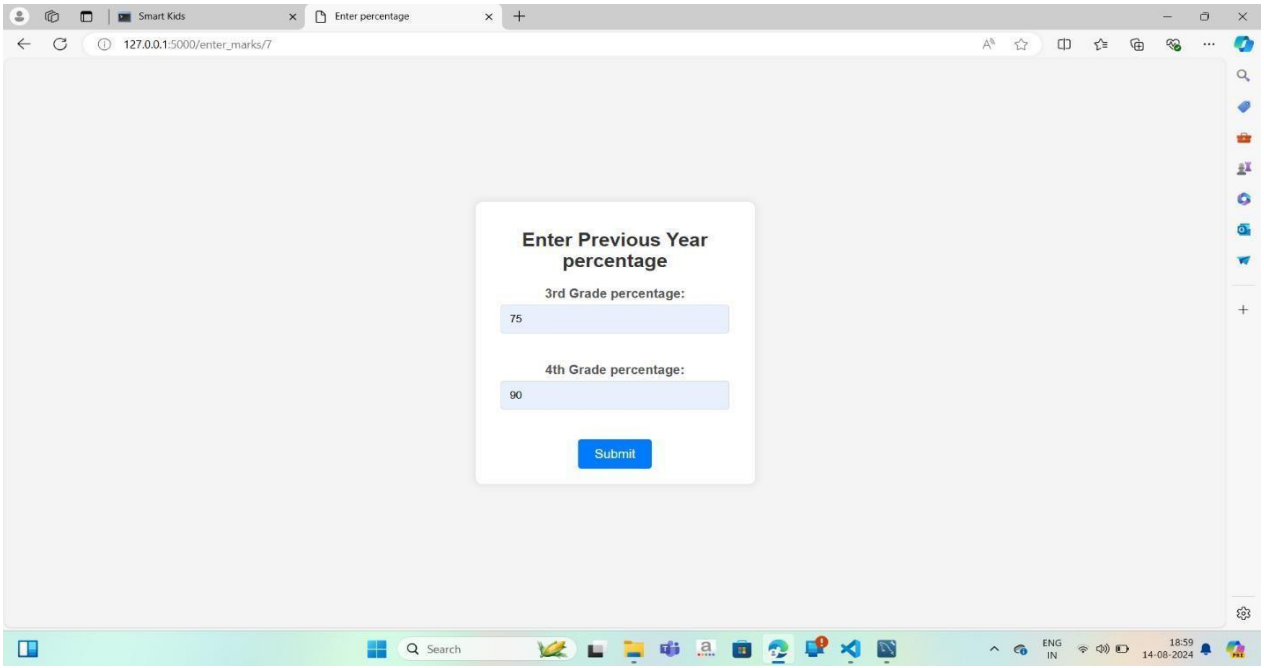

Fig 10.1.6: Enter Marks Page: The `enter_marks` function allows users to enter their third and fourth-grade marks.

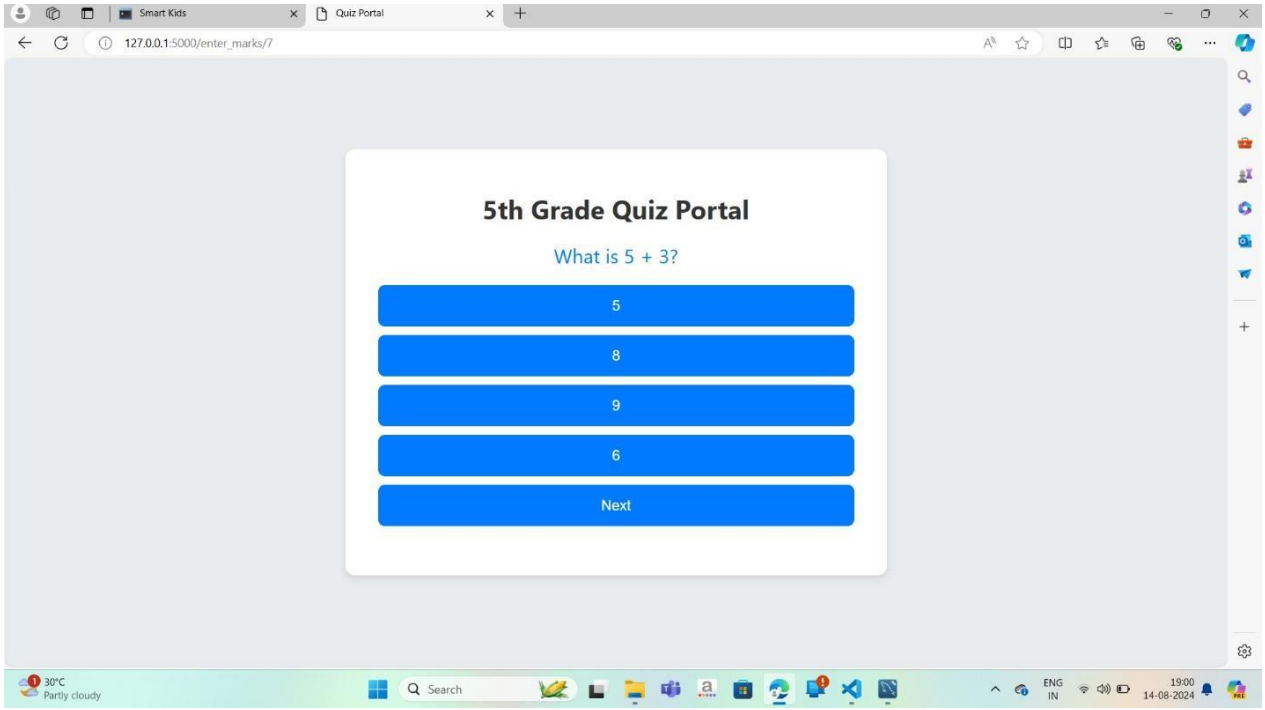

Fig 10.1.7: Quiz Page: Displays questions based on student previous given data about his grades and knowledge level.

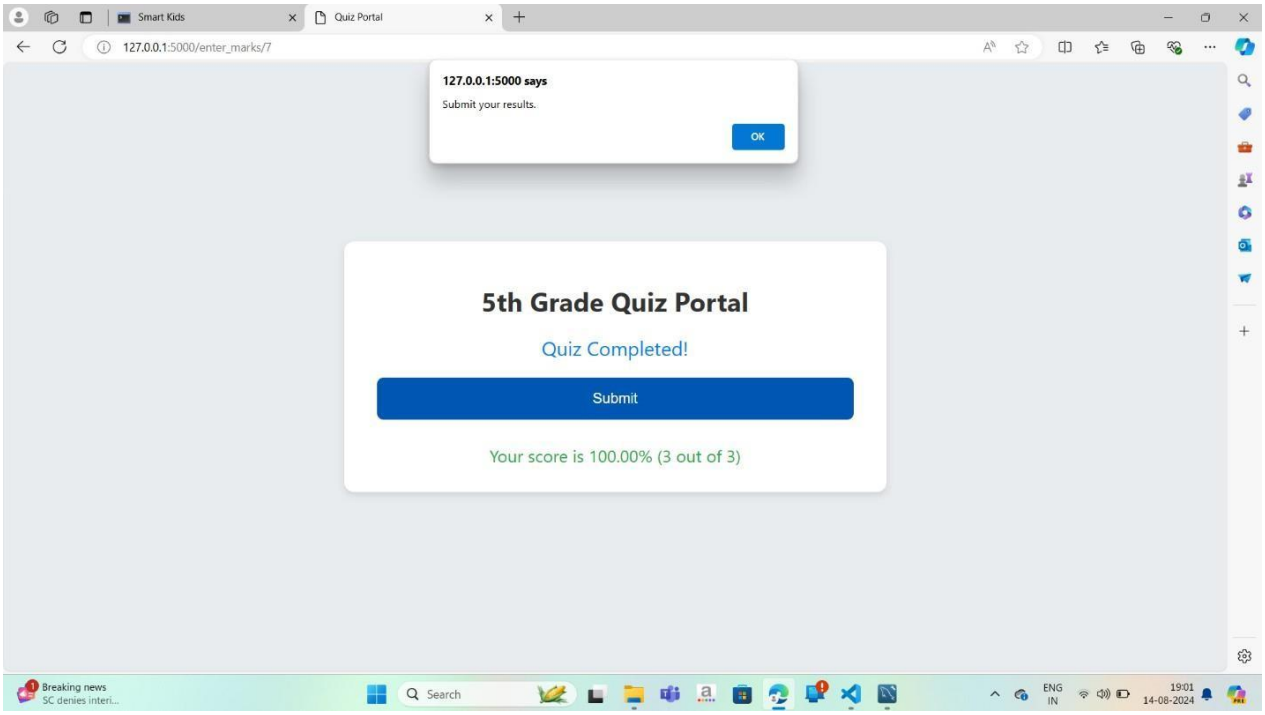

Fig 10.1.8: Submit Results Page : The `submit_results` function updates quiz results in the database.

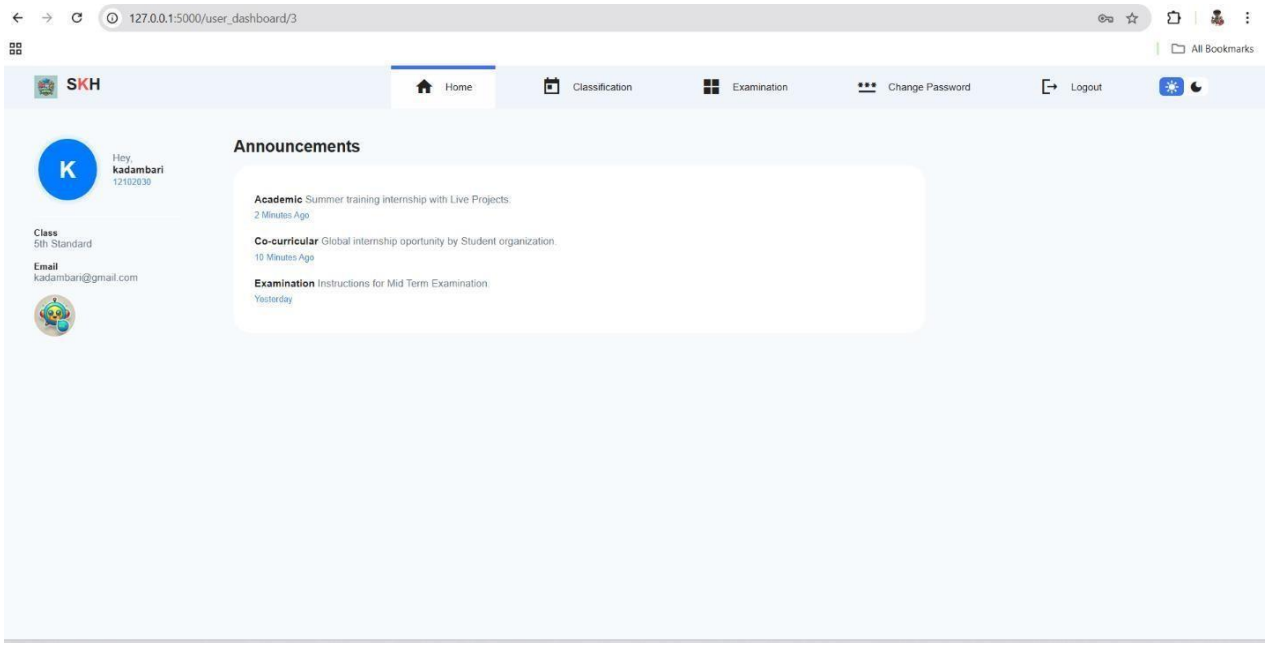

Fig 10.1.8: User dashboard: The `user_dashboard` function will display the user details.

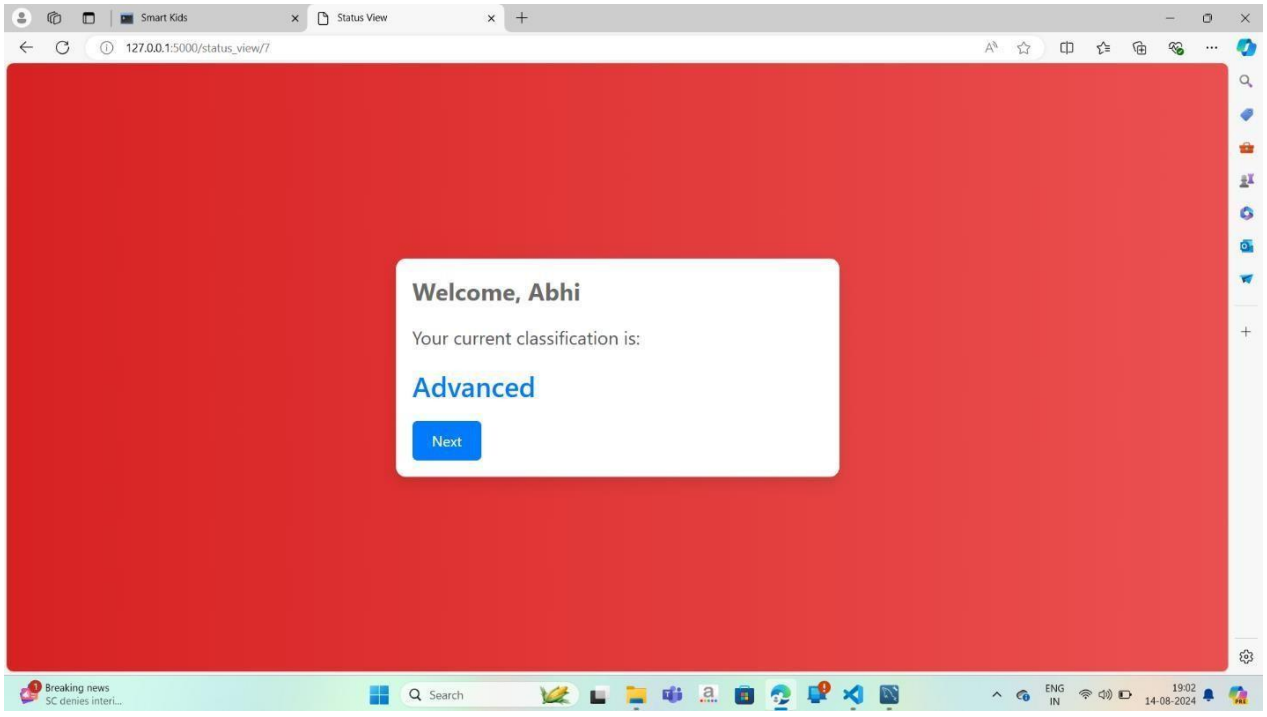

Fig 10.1.9: Classifier Page : This page URL displays the classification category of student among Basic, Average and Advanced.

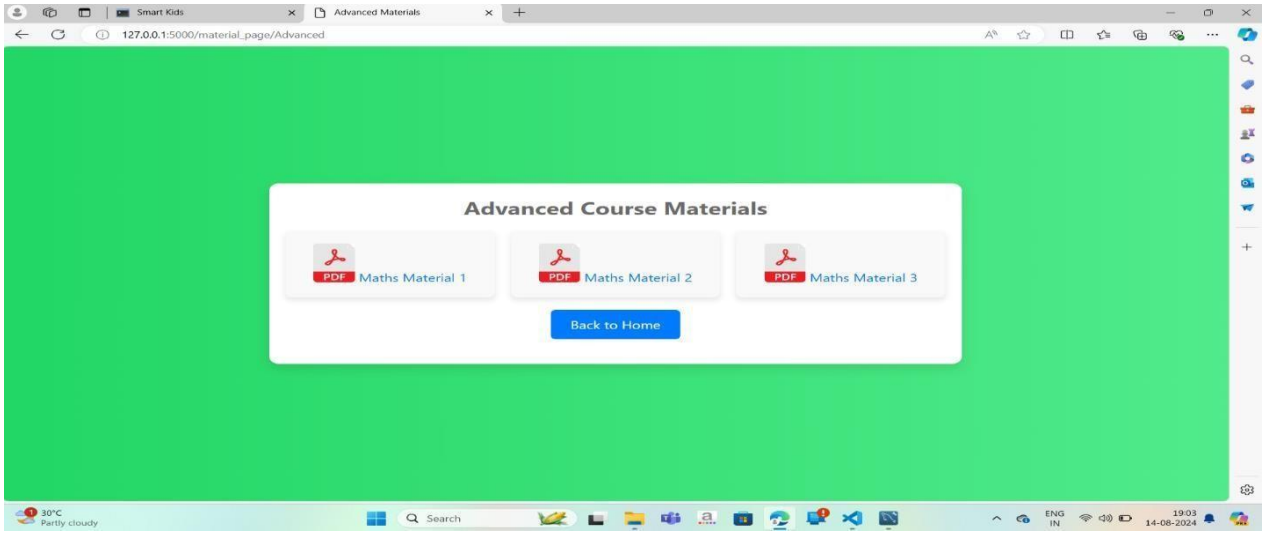

Fig 10.1.10: Displaying Courses Page : This page displays list of courses available for a student based on his grade and classification.

Fig 10.1.12: more quiz: The `more_quiz` function display all quizzes which have attempt many question.

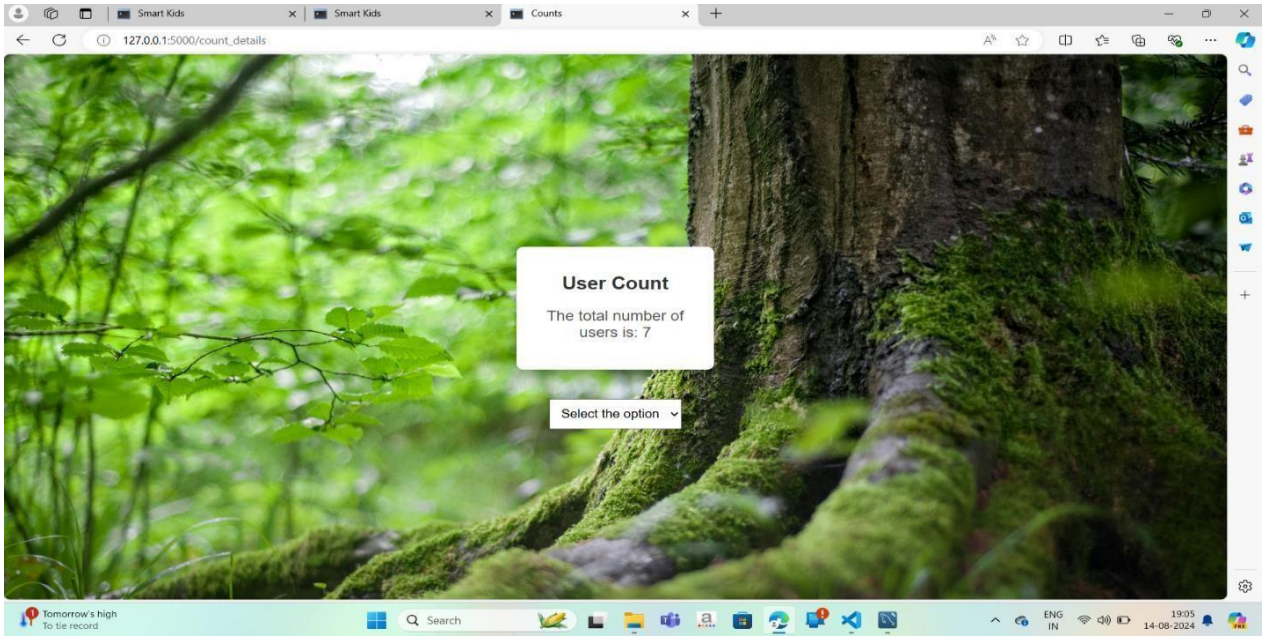

Fig 10.1.11: Count Details Page: The `count_details` function retrieves and displays the total number of users in the application.

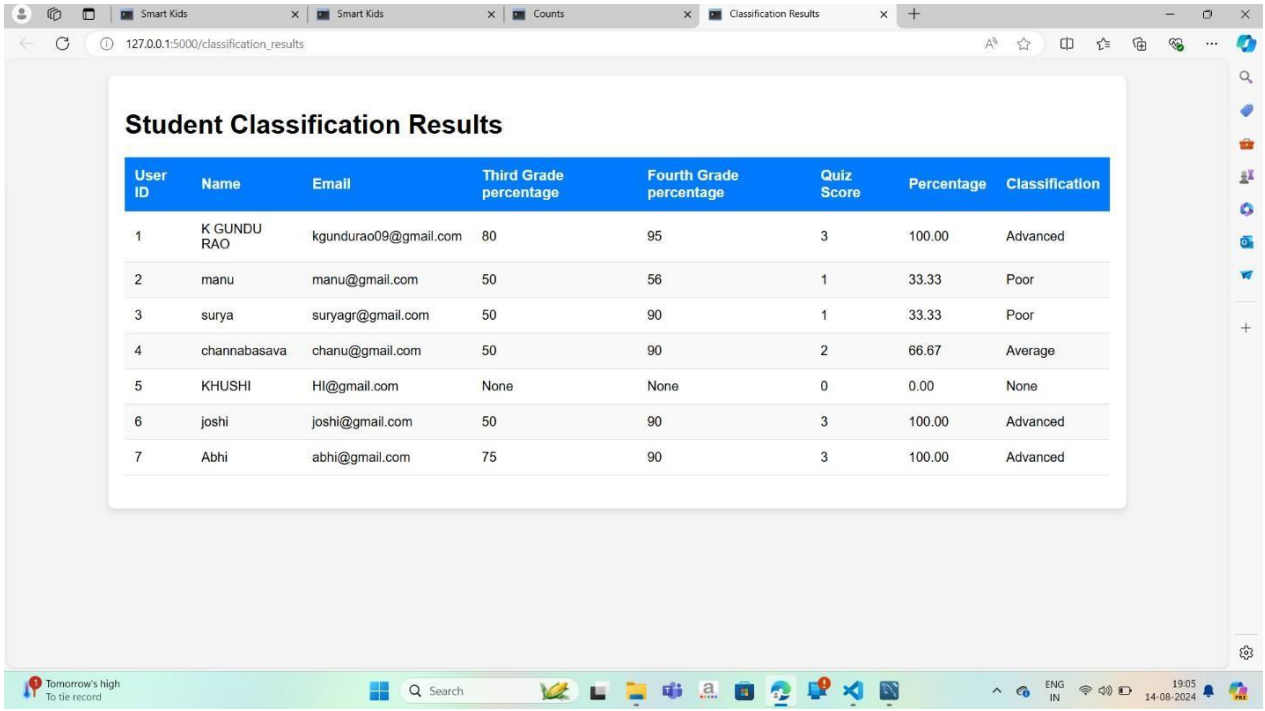

Fig 10.1.12: Status View Page: The `status_view` function displays a user's status, including their name, accessed via the `/status_view/<user_id>` URL.

Chapter 11:
Test Cases

Test_IDs	Inputs	Outcomes	Reason
T_001	Access the main page by visiting / URL.	Success	Valid: URL / is correct, and the main page loads properly. Invalid: If the URL is mistyped (e.g., /main) or if the template main.html is missing, resulting in a 404 error.
T_002	Access the contact page via /admin_contact URL.	Success	Valid: URL /admin_contact is correct, and the contact page loads properly. Invalid: If the URL is mistyped or template admin_contact.html is missing, resulting in a 404 error.
T_003	Admin attempts to log in using valid credentials via /login.	Success	Valid: Admin credentials are correct, and they are redirected to the admin area. Invalid: If credentials are incorrect, an error message is shown.
T_004	Admin attempts to log in using invalid credentials via /login.	Failure	Valid: Admin credentials are incorrect, and an error message is shown. Invalid: Credentials are valid, but an error occurs due to a backend issue, preventing login.
T_005	New user attempts to sign up via /user_signup with a unique email.	Success	Valid: Email is unique, and the user is successfully registered. Invalid: If email is already registered, resulting in an error message.
T_006	New user attempts to sign up via /user_signup with an already registered email.	Failure	Valid: The email is already in use, and the system correctly shows an error message. Invalid: If the email is actually unique, but an error occurs, preventing registration.
T_007	User attempts to log in with valid credentials via /user_login.	Success	Valid: Credentials are correct, and the user is redirected to their dashboard. Invalid: If credentials are correct, but an error occurs, resulting in login failure.

T_008	User attempts to log in with invalid credentials via /user_login.	Failure	Valid: Credentials are incorrect, and an error message is shown. Invalid: Credentials are invalid, but the system fails to show an error message, creating confusion for the user.
T_009	Admin attempts to add a new user via /add_user with unique email and matching passwords.	Success	Valid: Data is valid, and the user is added successfully. Invalid: If email is already in use or passwords don't match, resulting in an error message.
T_010	User attempts to enter marks via /enter_marks/<user_id> with valid data.	Success	Valid: Data is correct, and marks are updated successfully. Invalid: If user ID is invalid or data fails to update, resulting in an error.
T_011	User submits quiz results via /submit_results with valid JSON data.	Success	Valid: JSON data is correct, and results are updated. Invalid: If JSON data is malformed or missing fields, resulting in a failure to update the results.
T_012	Attempt to view the count details via /count_details.	Success	Valid: The page loads correctly, and the user count is displayed. Invalid: If the database fails to retrieve user count, resulting in an error or an empty display.
T_013	User tries to access their status via /status_view/<user_id> while logged in.	Success	Valid: User is logged in, and the status page displays correctly. Invalid: If user is not logged in or user ID is invalid, resulting in a redirect to the login page or an error.
T_014	User tries to access their status via /status_view/<user_id> without being logged in.	Failure	Valid: User is not logged in, and the system correctly redirects them to the login page. Invalid: The system fails to redirect, showing an unauthorized access error.
T_015	Run the application in debug mode using app.run(debug=True) and access various routes.	Success	Valid: Debug mode is active, and detailed error messages are shown if any issues occur. Invalid: If debug mode fails to start or does not display errors correctly.

Chapter 12:
Conclusion

The Smarty Kids Hub project aims to address significant gaps in the current educational technology landscape by providing a personalized, engaging, and secure learning experience for children. By leveraging adaptive learning technologies, incorporating gamification, ensuring robust data security, and supporting cross-platform accessibility, the project seeks to enhance educational outcomes and make learning more effective and enjoyable. The integration of cloud-based solutions further ensures that the platform can scale efficiently and adapt to evolving user needs, paving the way for a more dynamic and impactful educational experience.

Chapter 13:

References

[1] Juliet Harbauer Krupa, Angela Ciccia, Jonathan Dodd, Deborah Ettel, Brad Kurowski, Angela Lumba Brown, Stacy Suskauer, "Service Delivery in Health Care and Educational Systems for Children Following Traumatic Brain Injury ", Journal of Head Trauma Rehabilitation, ISSN: 0885-9701, Vol. 39, Issue: 6, November-December 2024, pp-467-478

[2] Sangeeta Chauhan, "SLOW LEARNERS: Their Psychology and Educational Programs ", International Journal of Multidisciplinary Research, ISSN: 2231-5780, Vol.1, Issue: 8, December, 2011, pp-34-45

[3] Sheela Sangwan & Krishna Duhan, "Human Ecological Systems and Multiple Intelligence of Slow Learning Adolescents ", Asian Journal of Dairy and Food Research, ISSN: 0973-6598, Vol. 29, Issue: 3, July-September 2024, pp-216-221

[4] Jorge Niosi, "National Systems of Innovations are 'x-Efficient' (and x-Effective): Why Some Are Slow Learners ", Research Policy, ISSN: 0048-7333, Vol.31, Issue: 2, February 2002, pp-291-302

[5] Appaji Korikana, "SLOW LEARNERS – A universal problem and providing Educational opportunities them to be a Successful Learner ", PEOPLE: International Journal of Social Sciences, ISSN: 2454-5899, Vol.6, Issue: 1, 2020, pp-29-42

[6] Walter Müller, Wolfgang Karle, "Social Selection in Educational Systems in Europe ", European Sociological Review, ISSN: 0266-7215, Vol.9, Issue: 1, May 1993, pp-1–23