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Academix – Transforming Learning with Consistency

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Abstract: *Academix is a modern educational platform focused on delivering consistent, goal-oriented, and personalized learning. It requires learners to master both problems and concepts to advance, ensuring real progress. Content is structured in a logical, topic-wise path, guiding users step by step for stronger understanding. Personal notes can be created for each concept, helping with retention and effective revision. An integrated to-do list lets learners organize study plans and track academic tasks efficiently. Active learning is encouraged through hands-on problem solving and mastery-based progression. Interactive exercises reinforce understanding and practical skills. A real-time progress dashboard gives learners clear insight into their achievements and areas for growth. Web-based, Academix is accessible anytime, on any device. Its clean, distraction-free interface promotes focus and sustained concentration. The platform fosters independent learning habits and self-motivation. Learners can set their own pace and revisit topics as needed. Academix adapts to diverse learning needs and supports long-term planning. It blends guidance, flexibility, and accountability for effective learning. Academix empowers users to own and shape their educational journey*

Keywords: Personalized learning, Goal-oriented education, Topic-wise content, Active learning, Problem solving, To-do list, Personal notes, Progress dashboard.

I. INTRODUCTION

In today's fast-evolving educational landscape, the need for personalised, consistent, and effective learning platforms is greater than ever. Traditional systems often fall short by encouraging surface-level engagement, such as passive logins or scattered content consumption. Academix addresses these challenges by offering a learner-centric platform that prioritises genuine progress and structured knowledge development. Designed for students, self-learners, and lifelong learners, Academix delivers topic-wise, logically ordered content to help users build strong conceptual foundations. The platform encourages active participation through problem-solving and concept completion rather than passive activity. Tools such as personal note-taking and an integrated to-do list allow users to organise their learning in a meaningful way. With real-time dashboards to track progress and a clean, accessible web interface, Academix removes distractions and supports focused study. By promoting independent learning and goal-oriented study habits, Academix empowers users to take control of their educational journey and achieve long-term success.

Motivation

With the rapid expansion of online learning, students and self-learners face challenges in maintaining consistent study habits, tracking progress, and receiving personalized feedback. Many existing educational platforms offer generic content delivery without addressing the unique needs, learning pace, or engagement levels of individual users. This often leads to decreased motivation, lack of discipline, and fragmented learning experiences. By combining personalized study tools, flexible scheduling, and habit-forming features, the platform aims to help users develop

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effective study routines, monitor their achievements, and foster long-term academic growth. The project aspires to bridge the gap between passive content consumption and active, self-directed learning in the digital age.

Problem Statement

Existing online learning platforms often fail to support consistent study habits, personalized learning, and active engagement. Generic content delivery and limited progress tracking make it hard for learners to stay motivated and monitor their achievements. This leads to fragmented learning experiences and hampers academic growth. Academix aims to solve these issues by providing structured, personalized, and engaging learning through topic-wise progression, habit-building features, and real-time feedback, empowering users to take control of their studies

Objectives of the project

The main objective of this project is to develop a web-based personalized learning platform that promotes structured, engaging, and self-directed study. The system aims to:

- Enable users to register, login, and access topic-wise learning modules.
- Allow learners to set study goals, track progress, and manage personal notes and to-do lists.
- Provide adaptive feedback, real-time dashboards, and visual progress tracking to support continuous improvement.
- Integrate gamification elements such as badges, streaks, and leaderboards to motivate and engage users.

Scope of the Project

This project aims to develop a web-based personalized learning platform focused on building effective study habits and tracking academic progress. Academix supports Learners and Admins, with learners accessing modules, tracking goals, and managing notes, while admins handle user and content management. The frontend uses HTML, CSS, and JavaScript for a responsive interface, and the backend uses Python with Django for secure data management. Real-time progress tracking and gamification are included to boost engagement. The platform is scalable and can be expanded with more features or integrations in the future.

Existing System

Current online learning platforms typically use centralized systems where all user data, study progress, and content are managed by a single authority or third-party servers. These platforms often lack personalization, providing generic content without adapting to individual learning needs. Users may find it difficult to monitor their progress effectively or build consistent study habits, and engagement tools are often limited. The centralized nature makes these systems vulnerable to data breaches and reduces user control over their own learning data. Moreover, limited feedback and motivation tools can hinder academic growth and self-directed learning.

Disadvantages:

- Vulnerable to data breaches and unauthorized access.
- Lack of personalized learning paths and feedback.
- Limited motivation and engagement features.
- Users have little control over their learning data.
- Progress tracking and habit-building tools are often inadequate.

Proposed System

The proposed system introduces Academix, a web-based personalized learning platform designed to improve study habits, engagement, and academic progress. It provides structured, topic-wise learning modules, goal setting, and real-time progress tracking. The platform uses Django for robust backend management and modern web technologies for a responsive frontend.

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Learners can set study goals, track streaks, and receive instant feedback, while gamification features such as badges and leaderboards motivate consistent learning. Admins have tools to manage users, content, and monitor platform activity. Academix ensures a transparent, engaging, and adaptive learning environment, scalable for future educational needs.

Advantages:

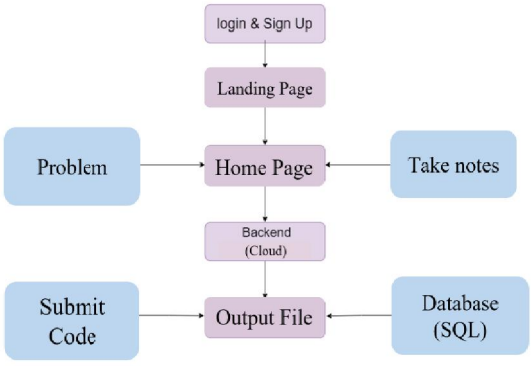
- Personalized and structured learning experience.
- Real-time progress tracking and feedback.
- Enhanced motivation through gamification (badges, streaks, leaderboards).
- Secure user authentication and data privacy.
- User-friendly, responsive, and scalable platform.

II. LITERATURE REVIEW

Adaptive Learning Path Navigation Based on Knowledge Tracing and Reinforcement Learning
Authors: Jyun-Yi Chen, Saeed Saeedvand, I-Wei Lai (2022)
Presents ALPN, combining knowledge tracing and reinforcement learning to adaptively guide learners, enhancing outcomes and path diversity.
A Personalised Learning Path Recommendation System with Collaborative Filtering and Content-Based Approaches
Authors: H. Yang, X. Luo, M. Zhang (2023)
Proposes a hybrid system using collaborative and content-based filtering to personalize learning paths, improving efficiency with tailored sequences.
Gamification of E-Learning in Higher Education
Authors: Amina Khaldi, Rokia Bouzidi, Fahima Nader (2024)
Reviews gamification (points, badges, leaderboards) in online education, emphasizing personalisation and noting limited research on content gamification.

III. SYSTEM ARCHITECTURE

The architecture of the Academix personalized learning platform demonstrates the interaction between learners, admins, the frontend interface, and the backend server. Learners access structured modules, set goals, and track progress through a responsive web interface. The backend, powered by Django, manages user authentication, content delivery, and real-time progress updates. Admins oversee user management, content creation, and analytics. The system is designed for scalability, data security, and seamless integration of new features, ensuring a reliable and adaptive learning environment.



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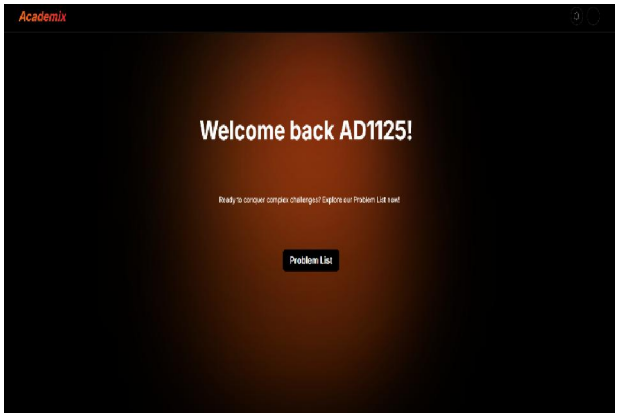
IV. IMPLEMENTATION AND FINAL OUTPUT

CODE SAMPLE :

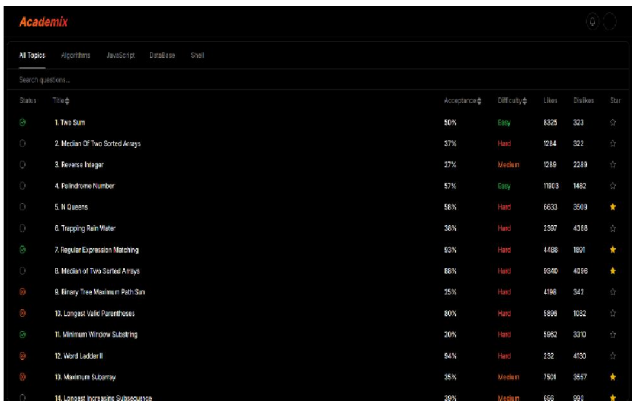
```
const accounts = express.Router();

accounts.post("/updateActivity", authenticateToken, async (req, res) => {
    const user = await UserModel.findById(req.user?.id);
    if (user) {
        const today = new Date().setUTCHours(0, 0, 0, 0); // Normalize to start of day
        const lastActivity = user.daily_activity_log[user.daily_activity_log.length - 1];

        if (lastActivity && new Date(lastActivity).setUTCHours(0, 0, 0, 0) === today) {
            return res.json({ success: true, message: "Already updated for today" });
        }

        user.daily_activity_log.push(new Date());
        if (new Date(lastActivity).setUTCHours(0, 0, 0, 0) === today - 86400000) {
            user.streak += 1; // Continue streak
        } else {
            user.streak = 1; // Reset streak
        }
        await user.save();
        res.json({ success: true, streak: user.streak });
    } else {
        res.status(404).json({ success: false, message: "User not found" });
    }
});

accounts.post(
    [],
    { id?: string; token?: string; success: boolean; message: string },
    User
```

Output:

1.Landing Page:



2.Home Page:



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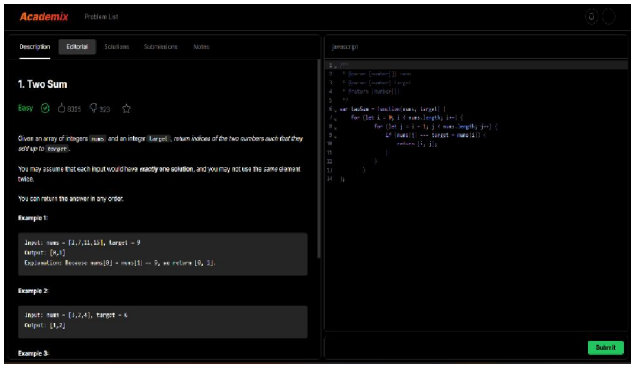
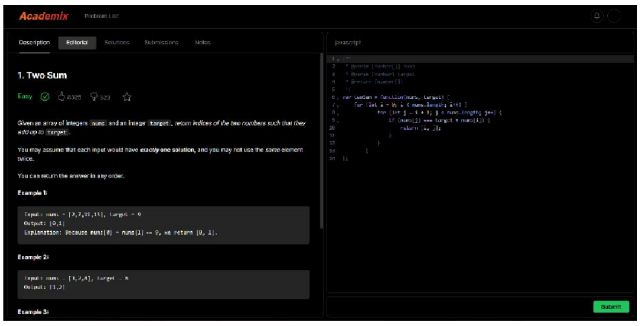
3.Problem Page:



Notes Page:



V. TESTING

Objective:

The objective of testing is to ensure that the Academix platform functions correctly, reliably, and provides a seamless user experience. Testing verifies that all modules—including user authentication, progress tracking, and content delivery—perform as expected under various conditions. The goal is to deliver a stable, user-friendly, and effective learning platform.

Testing Approach:

Manual testing was conducted to achieve comprehensive coverage of Academix's features and user flows.

Functional Testing:

Verified that each module (goal setting, progress tracking, study streaks, admin controls) performs its intended function.

UI Testing:

Checked the consistency, responsiveness, and usability of the user interface across different devices and browsers.

Boundary Value Testing:

Tested modules with minimum, maximum, and edge-case input values (e.g., empty fields in goal setting, maximum-length notes).

Negative Testing:

Ensured robust error handling by entering invalid data (e.g., incorrect login, unsupported file uploads).

Smoke Testing:

Quickly confirmed that critical features (user sign-up/login, goal creation, progress updates) work properly.

All issues identified during testing were addressed to ensure a smooth and reliable user experience.

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Feature	Test Scenario	Input Data	Expected Result	Status
User Registration	Register with valid details	Valid name, email, password	User registered successfully	Pass
User Registration	Attempt registration with missing fields	Empty email field	Show validation error	Pass
User Login	Login with correct credentials	Valid email and password	Redirect to personalized dashboard	Pass
User Login	Login with incorrect credentials	Wrong password	Show "Invalid credentials" message	Pass
Goal Creation	Add a new study goal	Goal: Complete Module 1 by Friday	Goal added and visible in dashboard	Pass
Goal Deletion	Remove an existing study goal	Click delete on "Complete Module 1"	Goal removed from dashboard	Pass
Progress Tracking	View progress on dashboard	N/A	Dashboard displays up-to-date progress	Pass
Authentication Redirect	Access dashboard without logging in	Direct URL access	Redirect to login page	Pass
Notes Validation	Add a note with invalid characters	Note: "###@@@"	Show validation error	Pass
User Logout	Logout from dashboard	Click logout	Redirect to login page	Pass

VI. CONCLUSION

The Academix platform overcomes traditional LMS limitations by providing a personalized, structured, and user-friendly learning environment. Learners can set goals, track progress, and manage notes, while admins efficiently oversee users and content. The Django backend ensures security and scalability, and the responsive frontend delivers a seamless experience. By focusing on personalization, real-time feedback, and accessibility, Academix enhances engagement and retention, making it a practical and scalable solution for modern digital learning needs.

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