Bangabandhu Sheikh Mujibur Rahman Science and Technology University

Campus Classroom

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Project Report

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Statement of Originality

It is hereby declared that the contents of this project is original and any part of it has not been submitted elsewhere for the award of any degree.

Signature of the Supervisor
Date:

Signature of the Candidate
Date:

Abstract

Campus Classroom is an innovative web application that serves as a comprehensive platform for educational collaboration and resource management within university settings. Building upon its initial features of providing centralized access to educational materials such as books, questions, and syllabuses, the extended version of Campus Classroom introduces advanced functionalities to facilitate teacher-student interaction and assignment management. This enhanced version enables both teachers and students to create accounts, empowering teachers to establish virtual classrooms and assign tasks with deadlines. Teachers can seamlessly add students to their classrooms and monitor their progress through task submissions. Students, in turn, can access assigned tasks, submit their assignments within specified deadlines, and receive feedback from their teachers. Key features of the extended Campus Classroom project include intuitive user account management, robust classroom creation and enrollment functionalities, efficient task creation and submission processes, and seamless communication channels between teachers and students. Through the integration of modern web technologies and user-centred design principles, Campus Classroom aims to revolutionize the educational experience by fostering collaboration, facilitating effective assignment management, and promoting meaningful interaction between teachers and students. By providing a centralized platform for academic engagement and resource sharing, Campus Classroom empowers users to maximize their learning potential and succeed in their academic pursuits.

Acknowledgements

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Chapter 1

Introduction

1.1 Motivation

The motivation behind Campus Classroom stems from the desire to integrate the successful features of Campus Library while addressing the specific challenges faced in assignment management and teacher-student interaction within university environments. Drawing inspiration from Campus Library's centralized access to educational resources, our aim is to create a user-friendly digital platform that not only facilitates resource sharing but also streamlines assignment creation, submission, and grading processes. By combining the collaborative aspects of Campus Library with innovative features tailored to classroom dynamics, Campus Classroom seeks to enhance educational collaboration and support the academic journey of students and educators alike.

1.2 Problem Definition

The primary problem addressed by the Campus Classroom project is the inefficiency of traditional assignment management methods within university settings. Educators often struggle to effectively communicate assignments, track student progress, and provide timely feedback, while students may face challenges in accessing and submitting assignments. The lack of centralized platforms for assignment management and communication exacerbates these issues, leading to suboptimal learning experiences and administrative burdens for educators. By identifying and addressing these challenges, Campus Classroom seeks to revolutionize assignment management and promote collaborative learning within university environments.

1.3 Objectives

Campus Classroom is a comprehensive web application developed to bridge the gap between teachers and students within university environments. Designed with a focus on enhancing assignment management and fostering educational collaboration, Campus Classroom provides a user-friendly platform for seamless interaction and engagement.

At the core of Campus Classroom is its intuitive interface, which allows teachers to create virtual classrooms tailored to specific courses or subjects. Within these classrooms, teachers can easily create tasks, assignments, or projects, complete with deadlines and relevant instructions. Students, in turn, can access these tasks, submit their assignments digitally, and receive feedback from their teachers.

Chapter 2

Related Works

Several existing solutions and research efforts focus on enhancing communication, collaboration, and assignment management within educational environments. The following are some notable examples:

2.1 Learning Management Systems (LMS)

Traditional learning management systems such as Moodle, Blackboard, and Canvas offer features for course management, content delivery, and student assessment. While these platforms provide robust functionalities for organizing course materials and conducting assessments, they may lack flexibility and user-friendly interfaces tailored to specific classroom dynamics.

2.2 Collaborative Online Platforms

Tools like Google Classroom, Microsoft Teams, and Slack have gained popularity for their collaborative features, allowing teachers and students to communicate, share resources, and collaborate on projects. However, these platforms may not offer specialized functionalities for assignment management, grading, or tracking student progress.

2.3 Assignment Management Tools

Dedicated assignment management tools such as Turnitin and Gradescope focus on plagiarism detection, grading automation, and providing feedback on student submissions. While these tools excel in specific aspects of assignment management, they may lack integrated communication features and comprehensive classroom management capabilities.

Chapter 3

Methodology

3.1 Development Approach

The development of the Campus Classroom web application followed the Waterfall software development methodology. The Waterfall model was chosen for its structured and sequential approach, allowing for a systematic progression through distinct phases of development, from planning to deployment.

3.2 Design Phase

The design phase focused on translating the requirements into a detailed system design. This involved architectural design, database design, and user interface design. Design documents, including system architecture diagrams, database schemas, and wireframes, were created to guide the development process. fig:3.1

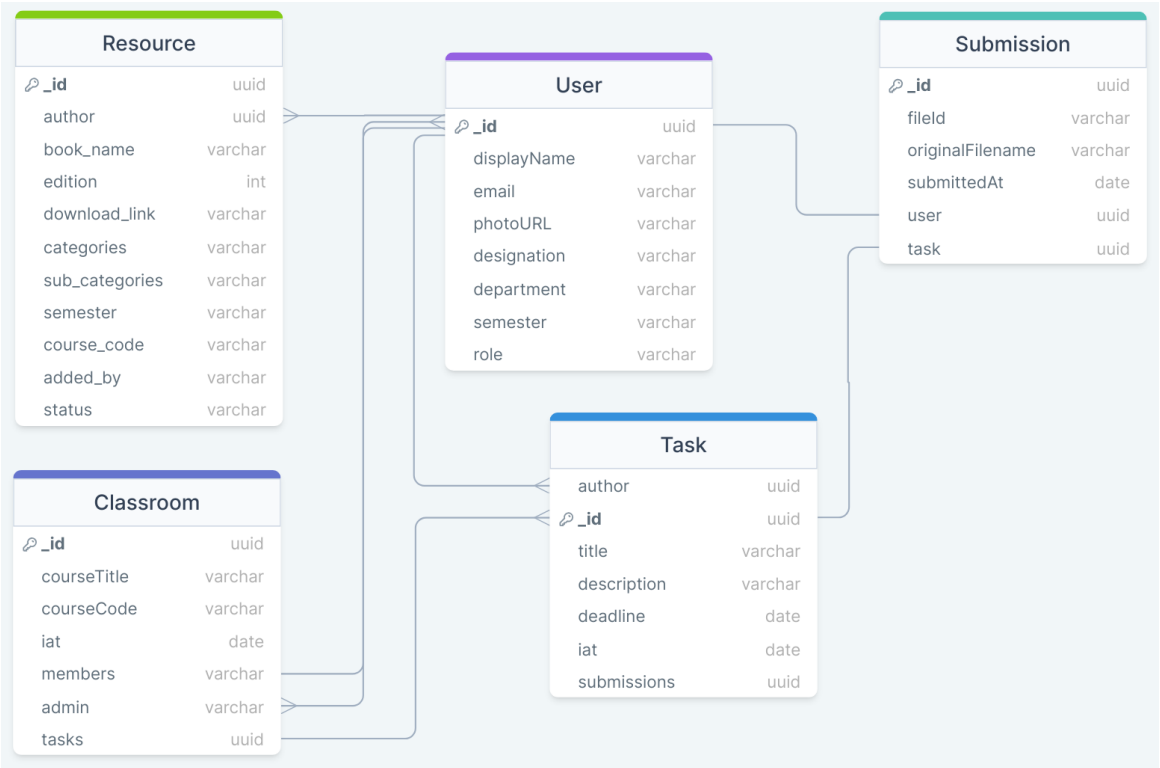

Figure 3.1: Entity Relation Diagram

3.3 Technology Stack

The technology stack for the Campus Classroom web application includes:

- Frontend: HTML, CSS, JavaScript, React.js
- Backend: Node.js, Express.js
- Database: MongoDB
- Additional Tools: GraphQL for API integration, Git for version control, Visual Studio Code for development environment

3.4 Security Considerations

Security was a top priority throughout the development process. Authentication and authorization were implemented using JSON Web Tokens (JWT) and bcrypt for password hashing. Input validation and data sanitization were performed to mitigate against common web vulnerabilities. Regular security audits and penetration testing were conducted to ensure the integrity and confidentiality of user data.

Chapter 4

Results

4.1 Key Features: Library

The Library feature within the Campus Classroom application serves as a centralized repository of educational resources, offering access to previous questions, books, and syllabuses for every department within the university.

4.1.1 Resource Availability

Within the Library feature, users can explore a variety of resources, including previous questions, books, and syllabuses for every department within the university. This extensive collection provides students with valuable study materials and reference materials to enhance their learning experience.

Figure 4.1: All departments of BSMRSTU

4.1.2 Search Functionality

The Library feature includes robust search functionality, allowing users to quickly and efficiently find relevant resources. Users can search for specific books by title, author, or keyword, enabling them to locate reading materials tailored to their academic interests or course requirements. Additionally,

users can search for previous questions or syllabus documents by course code, course title, or topic, facilitating easy access to course materials.

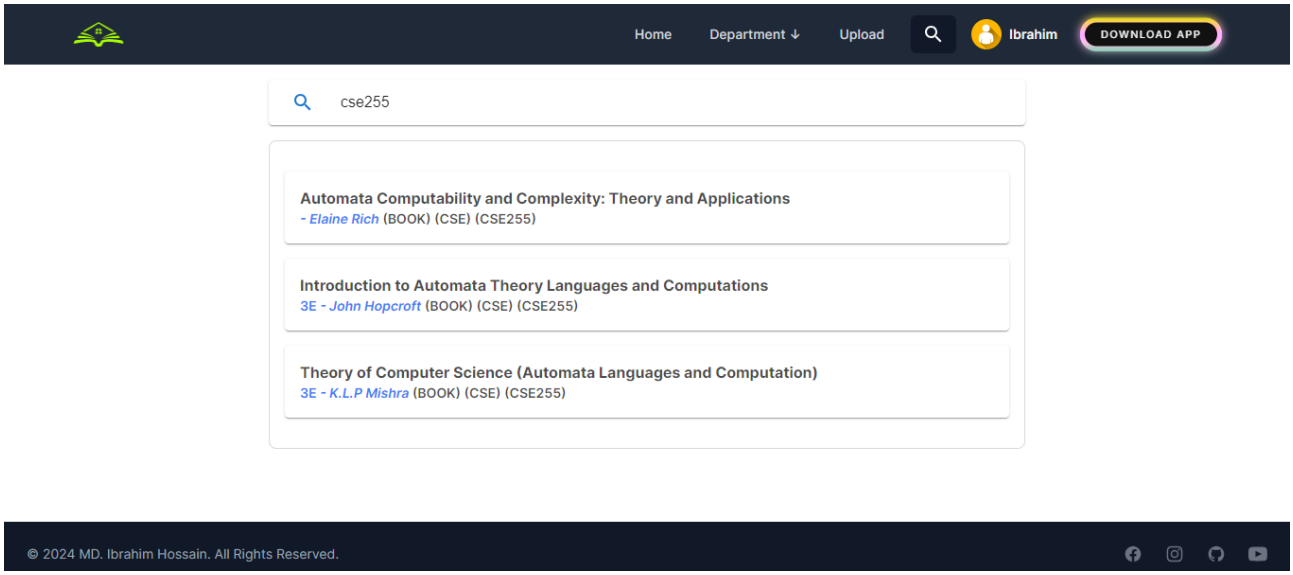

Figure 4.2: Search page

4.1.3 User Contribution

One of the key functionalities of the Library feature is user contribution. Logged-in users, including students and educators, have the ability to share their own resources with the wider campus community through an intuitive upload functionality. This fosters a culture of collaboration and knowledge-sharing among users, allowing them to contribute to the collective learning experience.

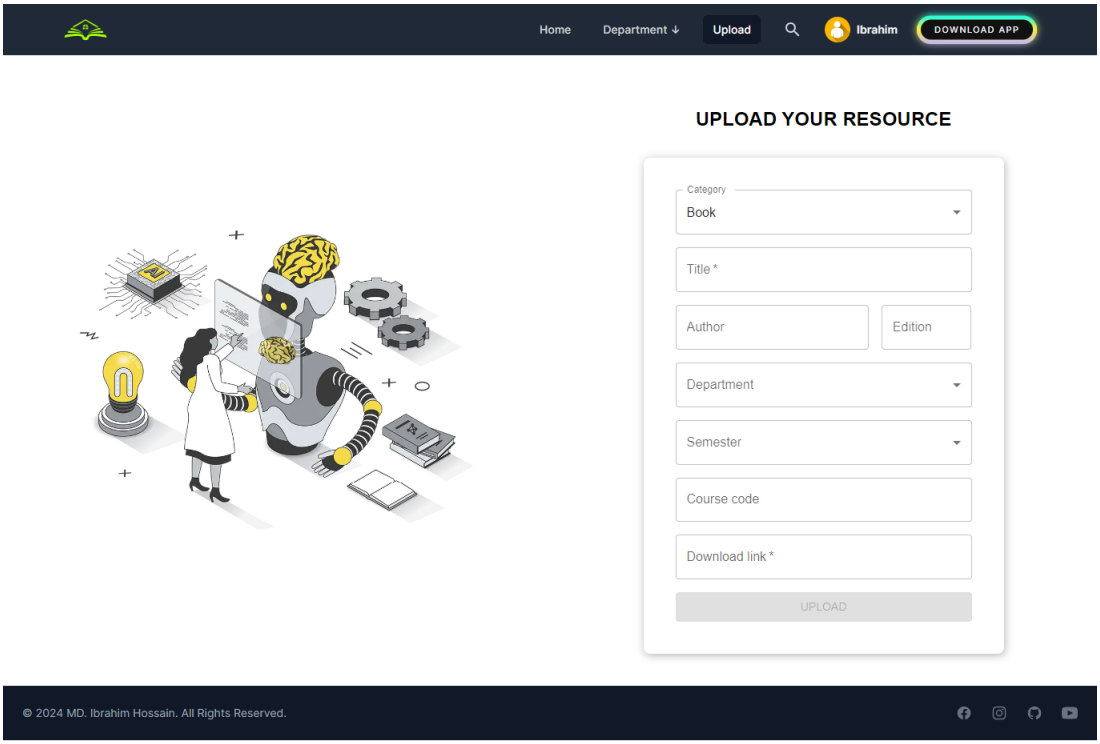

Figure 4.3: Upload page

4.2 Key Features: Classroom

The Classroom feature within the Campus Classroom application provides teachers with a robust platform for managing course materials, communicating with students, and facilitating assignment submission and feedback.

4.2.1 Classroom Creation

Teachers can easily create a new classroom by providing essential details such as the course code, course title, and classroom name. This ensures accurate representation and organization of courses within the application.

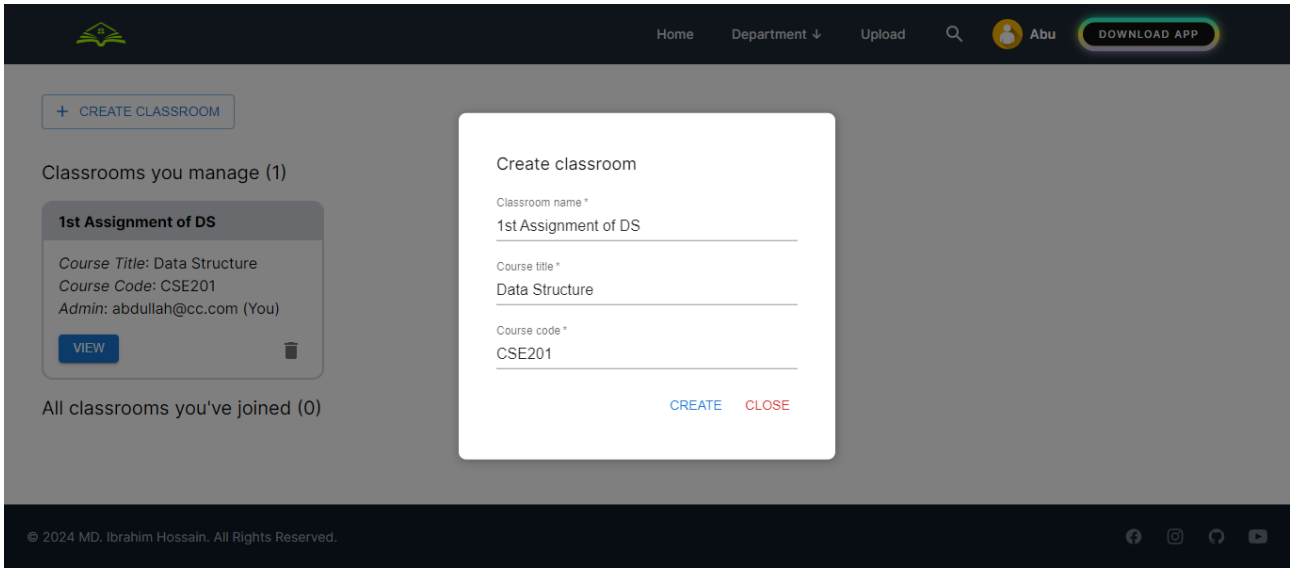

Figure 4.4: Classroom creation modal

4.2.2 Student Enrollment

Add All Students: The classroom creator has the option to streamline student enrollment by adding all students of a specific semester belonging to a particular department to the classroom. This simplifies the process of including relevant students and ensures that the classroom roster is comprehensive.

Add Members: Additionally, teachers can manually add members to the classroom by specifying their email addresses. This allows for the inclusion of individuals such as teaching assistants or guest speakers who may contribute to classroom activities.

4.2.3 Assignment Management

Create Tasks: Teachers have the capability to create tasks or assignments within the classroom, defining parameters such as the task title, description, and deadline. This empowers teachers to structure coursework and set clear expectations for student deliverables.

Task Deadline: Each task created by the teacher includes a specified deadline, enabling students to plan their work and submit assignments within the designated timeframe.

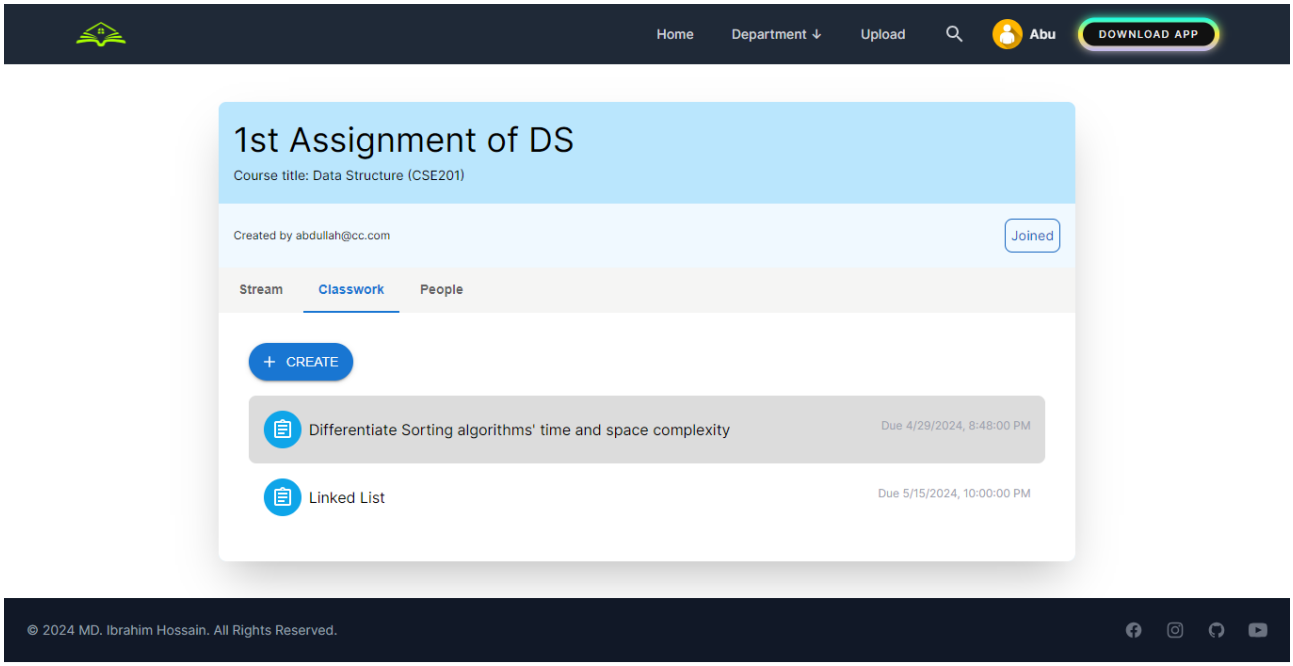

Figure 4.5: Task list view in classroom

4.2.4 Assignment Submission

Submit Assignments: Students can easily submit their assignments for a given task through the classroom interface. Submission options may include file uploads, text submissions, or links to external resources.

Deadline Enforcement: The system enforces task deadlines, ensuring that students can only submit assignments within the specified timeframe. This promotes accountability and adherence to course deadlines.

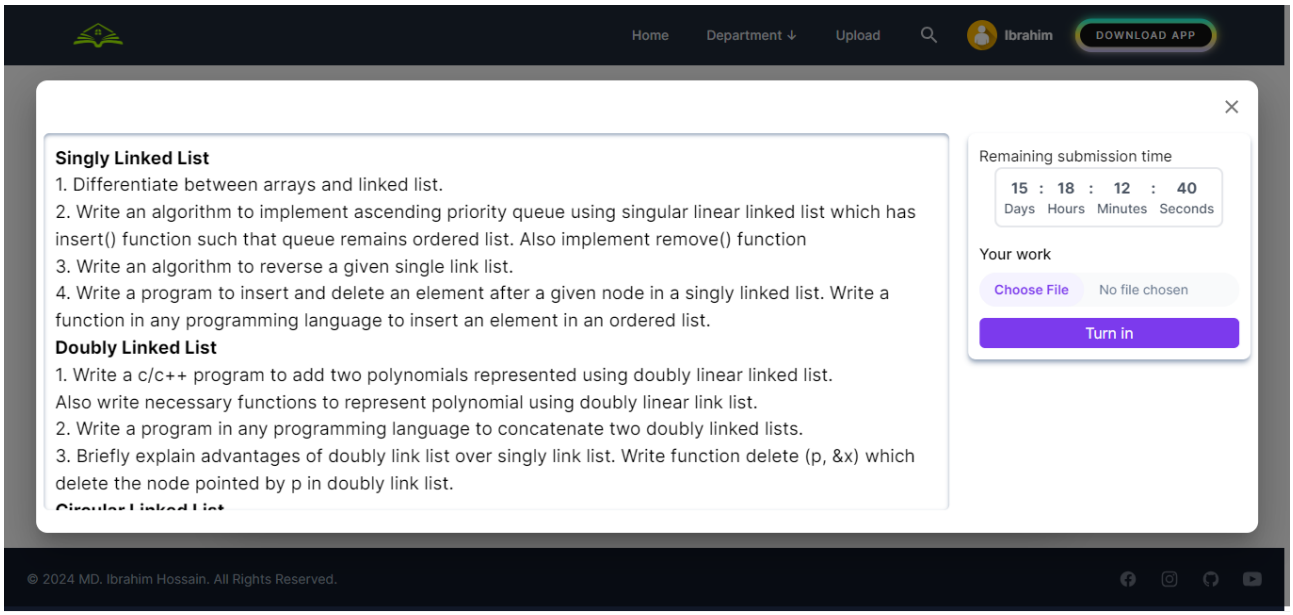

Figure 4.6: Task submission modal

Chapter 5

Conclusion

In conclusion, the Campus Classroom project has successfully addressed the need for a centralized platform to facilitate teacher-student interaction, streamline assignment management, and foster educational collaboration within university environments.

The project has achieved its objectives by providing robust features such as the Library and Classroom, which empower users to access resources, create virtual classrooms, assign tasks, and submit assignments seamlessly.

Future Scope

Looking ahead, there is considerable potential for further enhancements and expansion of the Campus Classroom application. Some avenues for future development include:

1. **Enhanced Collaboration Features:** Introducing more interactive collaboration tools such as real-time chat, collaborative document editing, and video conferencing to facilitate richer communication and teamwork among users.

2. **Advanced Analytics and Insights:** Implementing analytics features to track student engagement, performance trends, and assignment submissions. Providing educators with actionable insights to optimize teaching strategies and support student success.

3. **Integration with Learning Management Systems (LMS):** Integrating with existing LMS platforms to leverage their features and functionalities, enabling seamless data exchange and enhancing the overall learning experience for users.

In conclusion, the Campus Classroom project has laid a strong foundation for revolutionizing educational practices and fostering a more dynamic and engaging learning environment. With ongoing development and innovation, it has the potential to further transform the landscape of higher education in the future.

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