CSE 3102: Software Engineering Sessional

AcademiaQuest

Submitted By:

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Year: 3rd **Semester:** 1st

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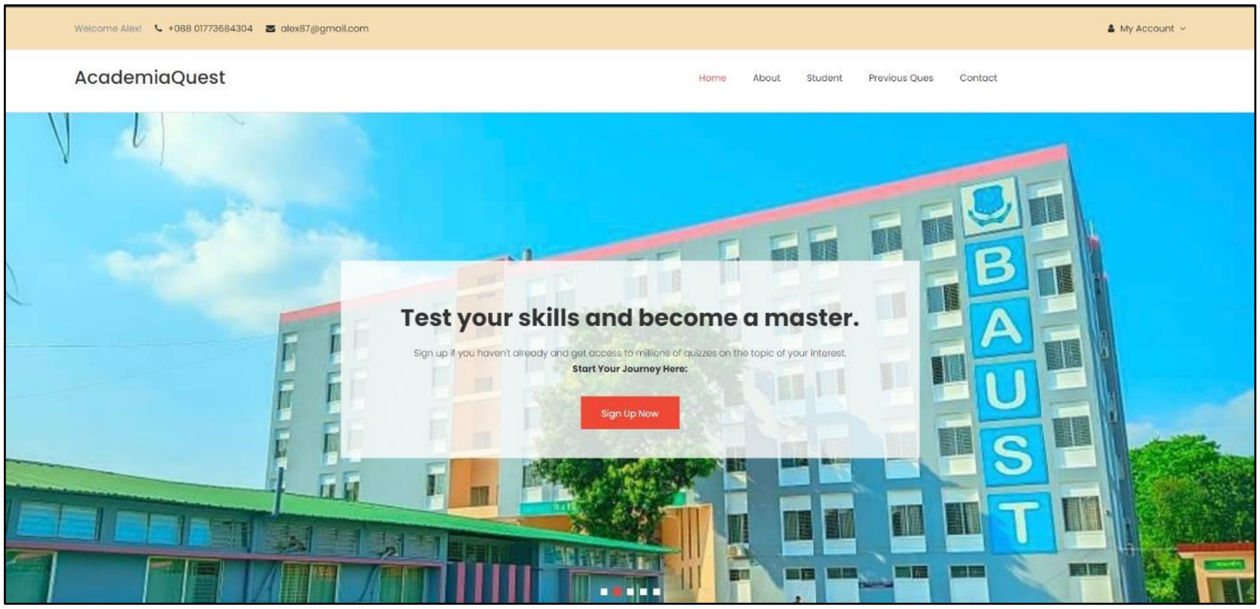
Chapter 1: Introduction

AcademiaQuest was conceived with the vision of revolutionizing learning by making it both enjoyable and accessible for students and educators. It aims to be a comprehensive web-based application tailored to the needs of universities, offering a plethora of educational resources and features. Developed using the ASP.NET framework and adhering to the Model-View-Controller (MVC) pattern, AcademiaQuest is poised to provide a seamless and user-friendly experience for all its users.

In today's fast-paced world, education stands as a cornerstone of societal progress and individual empowerment. However, traditional educational approaches often fall short in engaging students and maximizing learning outcomes. Recognizing this challenge, **AcademiaQuest** emerged as a pioneering initiative to redefine the educational landscape.

Driven by a passion for innovation and a commitment to excellence, **AcademiaQuest** aims to transcend the limitations of conventional learning methodologies. By harnessing the power of technology and leveraging the latest advancements in web development, we aspire to create a platform that not only facilitates learning but also inspires a lifelong love for knowledge.

At the heart of **AcademiaQuest** lies a simple yet profound philosophy: learning should be fun, accessible, and meaningful for all. Whether you're a student grappling with complex concepts, an educator seeking innovative teaching tools, or an administrator navigating the complexities of educational management, **AcademiaQuest** endeavors to be your trusted companion on the journey of learning and discovery.



Test your skills and become a master.

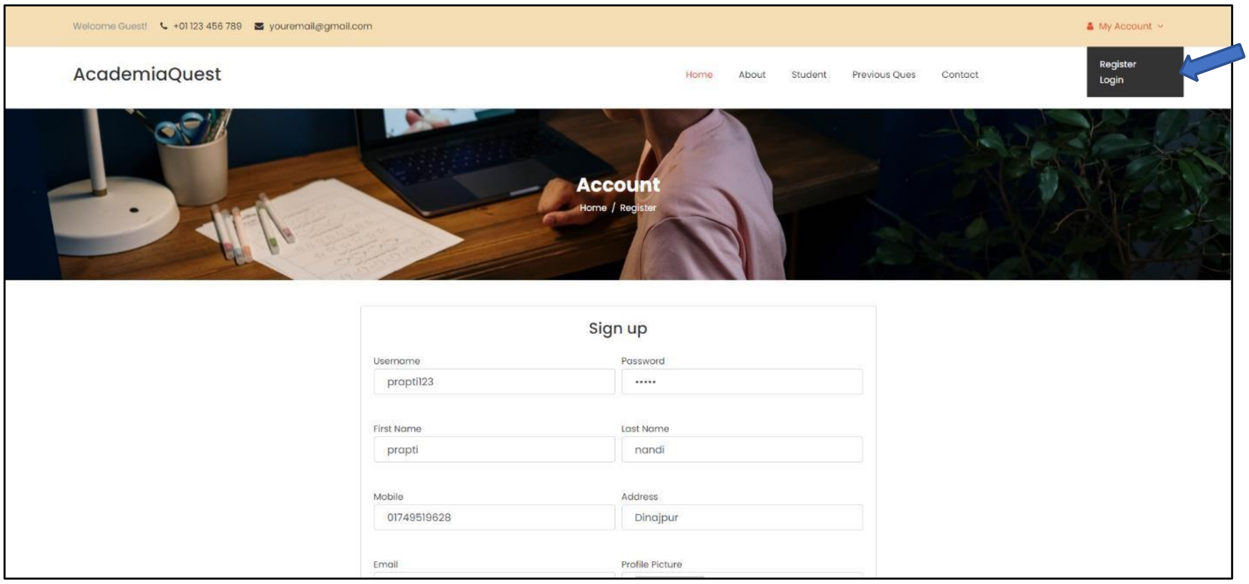
Sign up if you haven't already and get access to millions of quizzes on the topic of your interest.
Start Your Journey Here:

Fig.1 Homepage

Chapter 2: Project Feature Description

1. User Authentication

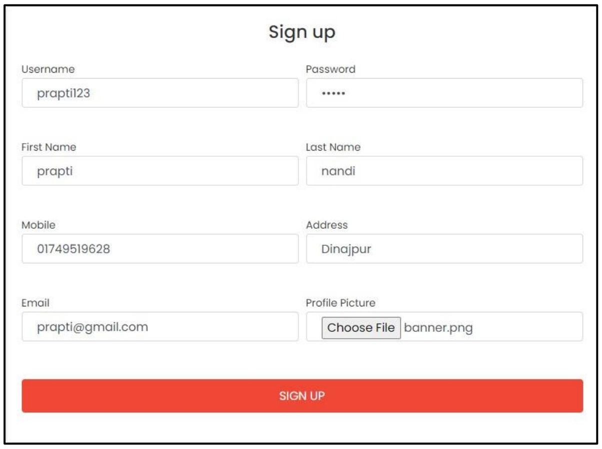
User authentication is a fundamental aspect of **AcademiaQuest,** ensuring that access to the platform is secure, controlled, and personalized for each user. In today's digital landscape, where privacy and security concerns are paramount, robust authentication mechanisms are essential to safeguarding sensitive user data and maintaining the integrity also intuitive, streamlined of the platform.



Sign up

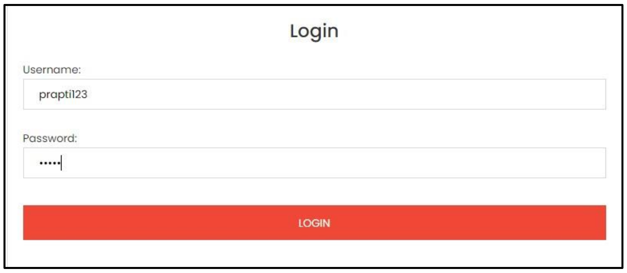
Username: prapti123
Password: •••••
First Name: prapti
Last Name: nandi
Mobile: 01749519628
Address: Dinajpur
Email
Profile Picture

Fig.2 Register or Login



Sign up

Username: prapti123
Password: •••••
First Name: prapti
Last Name: nandi
Mobile: 01749519628
Address: Dinajpur
Email: prapti@gmail.com
Profile Picture: Choose File banner.png



Login

Username: prapti123
Password: •••••

Fig.3 Register

Fig.4 Login

2.Student Dashboard

The student dashboard serves as the central hub of the **AcademiaQuest** platform, offering students a personalized and intuitive interface to manage their learning journey, track their progress, and access a wealth of educational resources. Designed with the needs and preferences of students in mind, the dashboard provides a seamless and immersive user experience, empowering students to take control of their learning and achieve their academic goals.

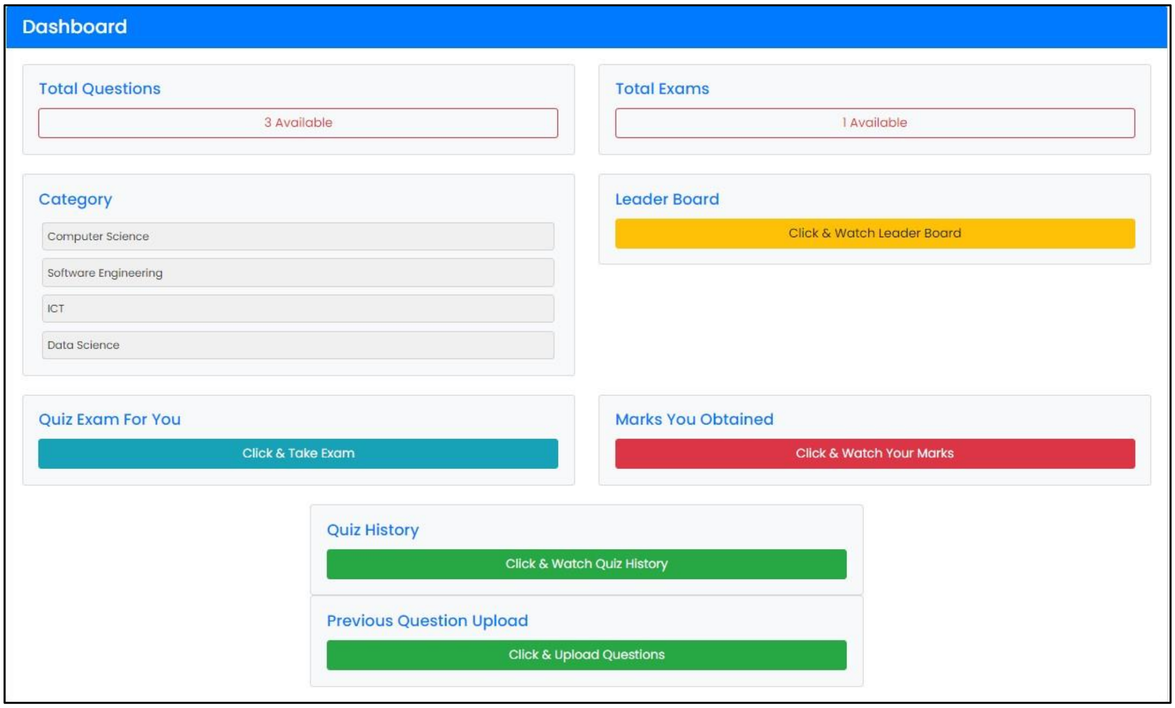


Fig.5 Student dashboard

At the heart of the student dashboard lies a commitment to personalization and customization, ensuring that each student's learning experience is tailored to their unique needs, interests, and learning styles. Key features of the student dashboard include:

Total Questions: Here we can see all the questions that has been uploaded.

Category: It shows us different courses.

Quiz History: Here we can see our exam history.

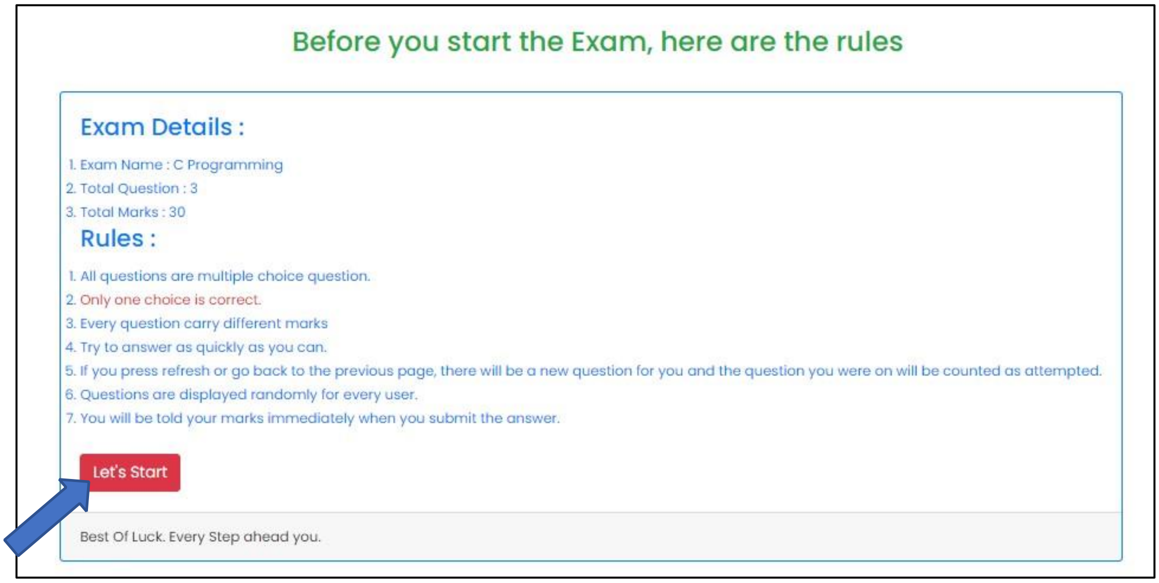
Quiz Rating: We can also rate the quizzes.

Leader Board: Its for showing the ranking.

Previous Question Upload: We can upload our offline exam questions or important questions of different courses here.

3.Quiz Platform

Our quiz platform serves as a dynamic hub for interactive learning experiences. From pop quizzes to comprehensive assessments, students can test their knowledge, track their progress, and engage in friendly competition with their peers.



Before you start the Exam, here are the rules

Exam Details :

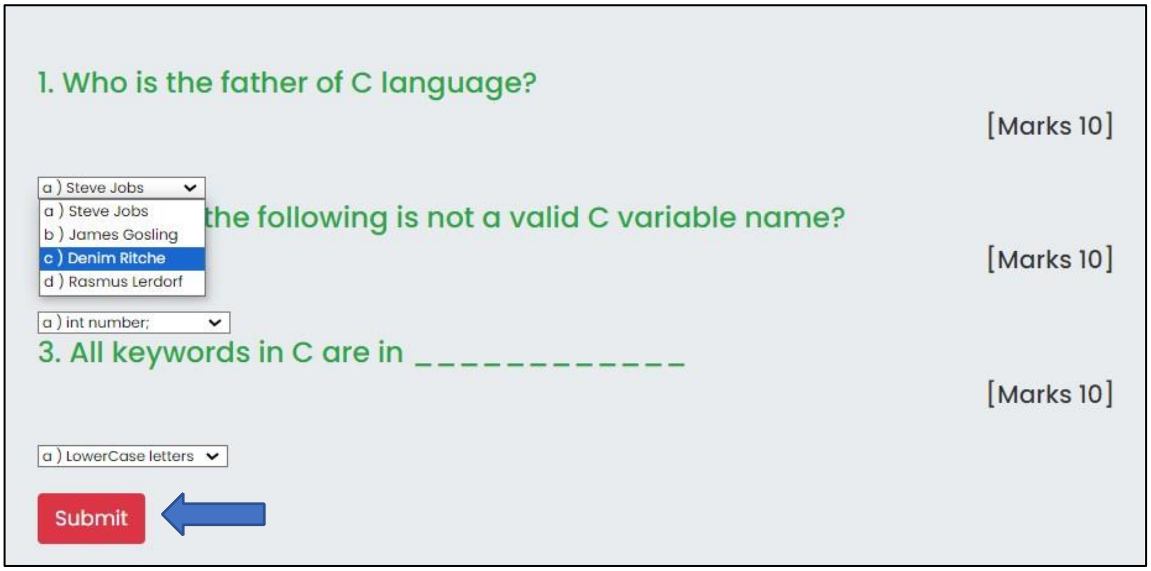
1. Exam Name : C Programming
2. Total Question : 3
3. Total Marks : 30

Rules :

1. All questions are multiple choice question.
2. Only one choice is correct.
3. Every question carry different marks
4. Try to answer as quickly as you can.
5. If you press refresh or go back to the previous page, there will be a new question for you and the question you were on will be counted as attempted.
6. Questions are displayed randomly for every user.
7. You will be told your marks immediately when you submit the answer.

Best Of Luck. Every Step ahead you.

Fig.6 Quiz Rules



1. Who is the father of C language?

[Marks 10]

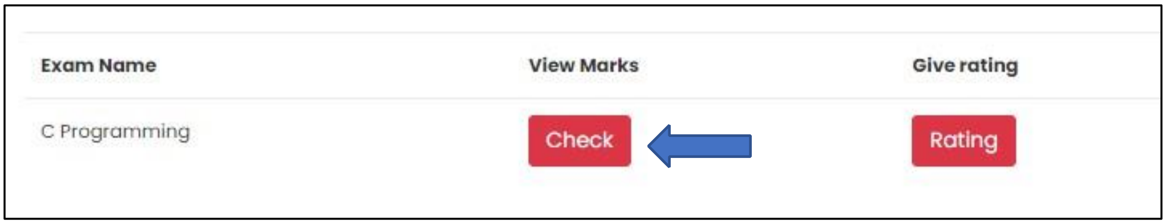
the following is not a valid C variable name?

[Marks 10]

3. All keywords in C are in ____________

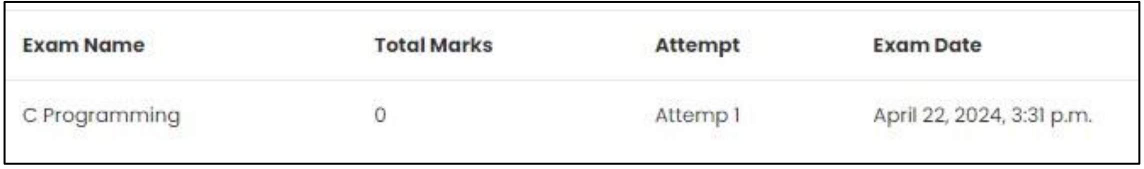
[Marks 10]

Fig. 7 Quiz Taking



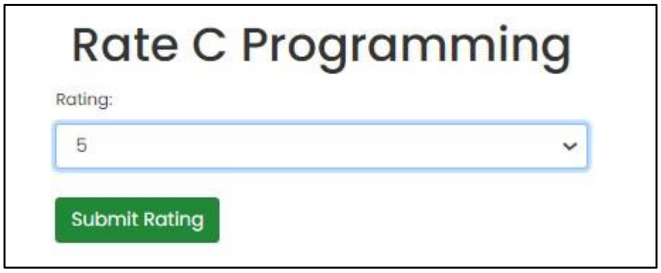
Exam Name	View Marks	Give rating
C Programming	Check	Rating

Fig. 8 Check marks & Giv e rating



Exam Name	Total Marks	Attempt	Exam Date
C Programming	0	Attemp 1	April 22, 2024, 3:31 p.m.

Fig.9 Check marks



Rate C Programming

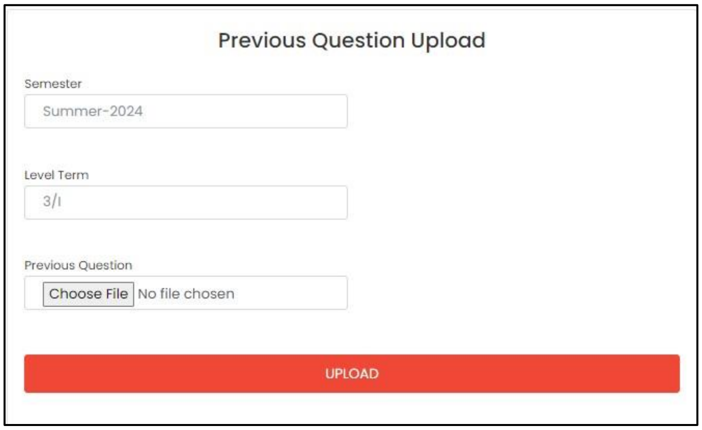
Rating: 5

Fig.10

Rate Quiz

4.Previous Question Upload

One of the core functionalities of the **AcademiaQuest** platform is the ability for users to upload and access previous questions from exams, quizzes, and assignments. This feature serves as a valuable resource for students, educators, and administrators, enabling them to review past materials, track academic progress, and facilitate more effective teaching and learning experiences.



Previous Question Upload

Semester: Summer-2024

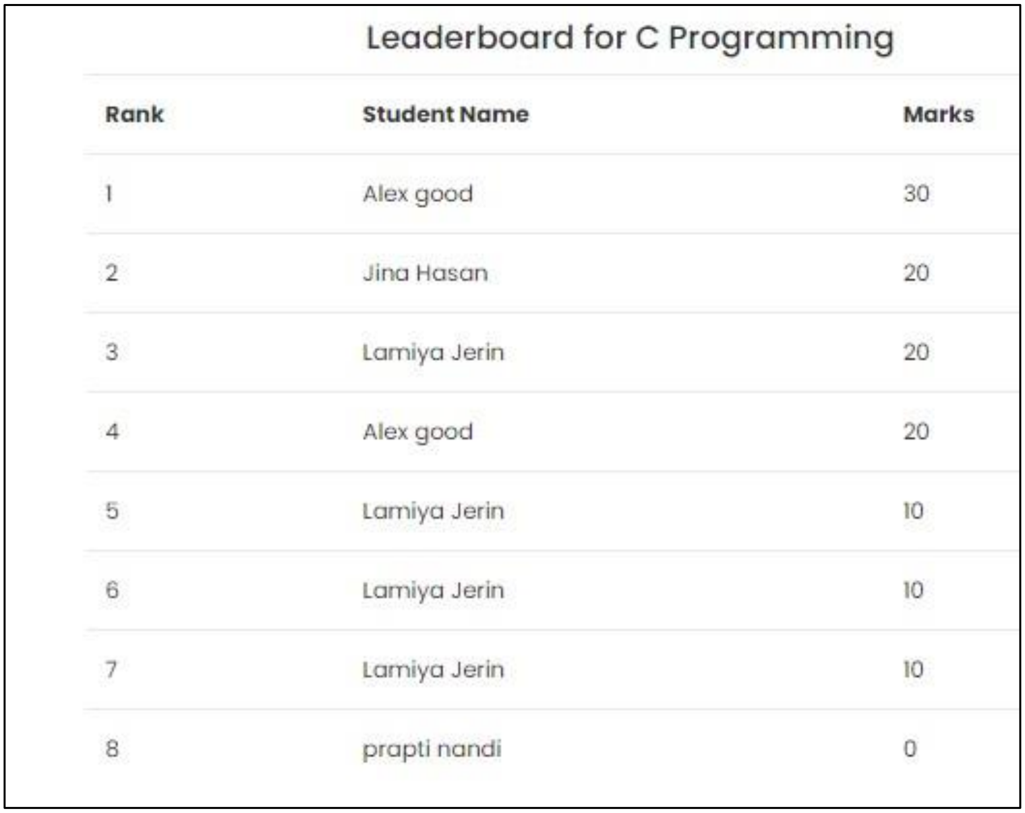
Level Term: 3/I

Previous Question: Choose File No file chosen

Fig.11 Upload Questions

5.Leader Board

The Leaderboard feature in **AcademiaQuest** serves as a dynamic and engaging tool to motivate students, foster healthy competition, and recognize academic achievement. By providing a transparent and interactive platform for tracking student progress and performance, the Leaderboard feature enhances the overall learning experience and promotes a culture of excellence and continuous improvement.



Leaderboard for C Programming

Rank	Student Name	Marks
1	Alex good	30
2	Jina Hasan	20
3	Lamiya Jerin	20
4	Alex good	20
5	Lamiya Jerin	10
6	Lamiya Jerin	10
7	Lamiya Jerin	10
8	prapti nandi	0

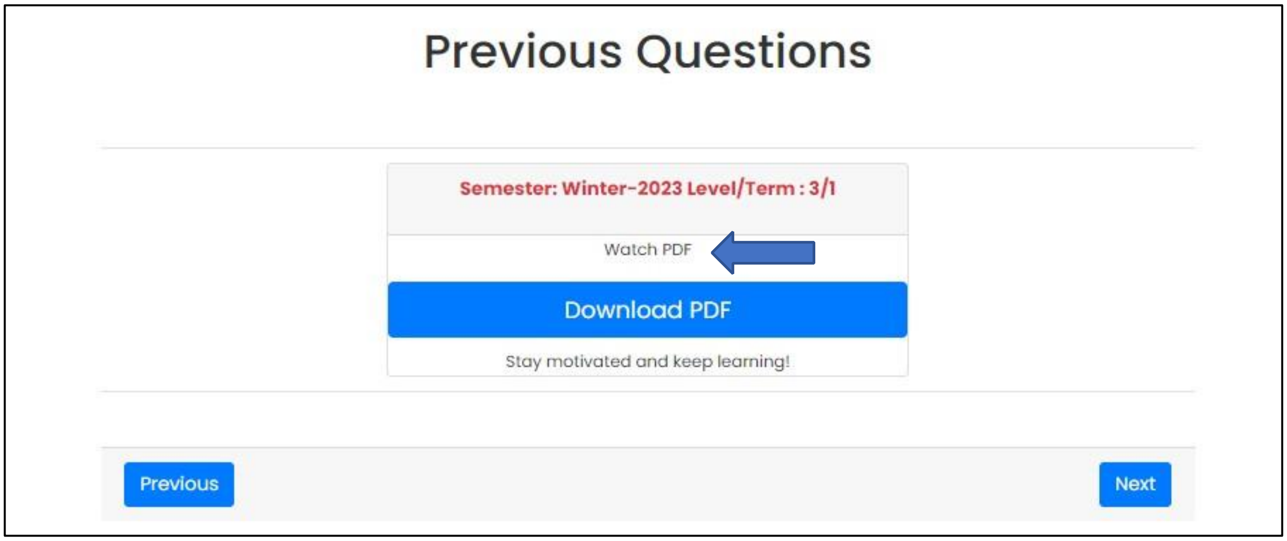
Fig.12 Ranking

Students may earn achievement badges or virtual rewards for reaching milestones, achieving high scores, or demonstrating exceptional performance. These badges serve as tangible symbols of accomplishment and incentivize continued engagement and participation.

6.Study Previous Questions (Question Bank)

The question bank serves as a treasure trove of academic resources, housing a vast collection of past questions across various subjects and disciplines. Students can delve into this repository to review key concepts, reinforce their understanding, and prepare for exams with confidence.

In addition to quizzes and question banks, **AcademiaQuest** offers a curated selection of educational resources to enrich the learning journey. From multimedia tutorials to insightful articles, students can explore diverse learning materials tailored to their interests and learning styles.

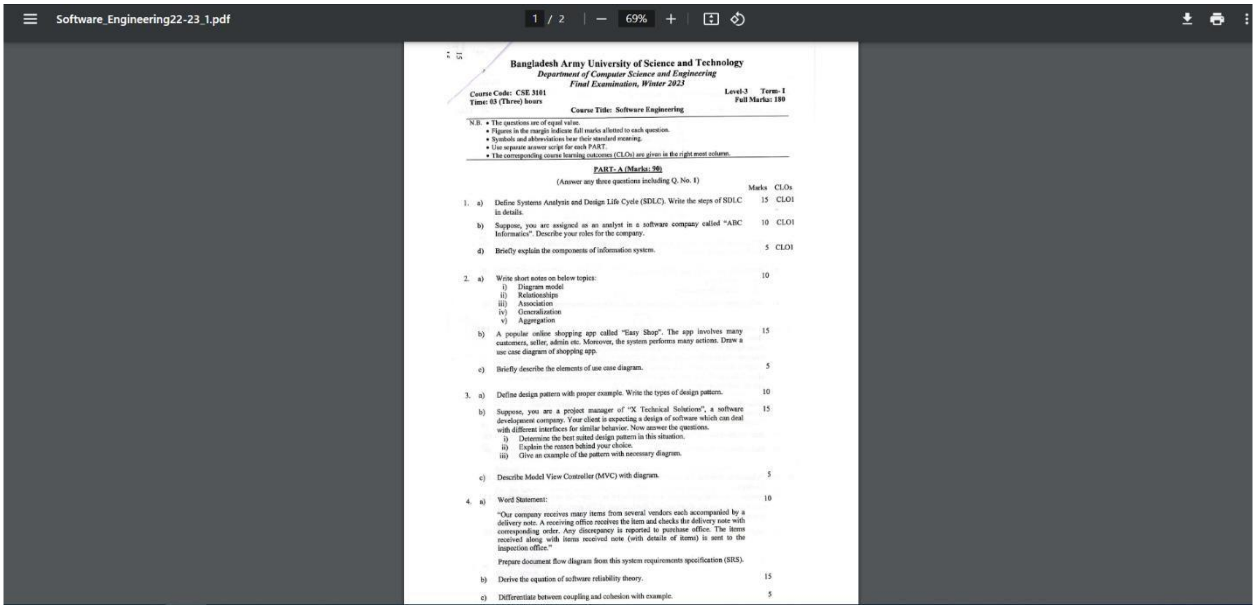


Previous Questions

Semester: Winter-2023 Level/Term : 3/1

Stay motivated and keep learning!

Fig. 13 Study Previous Questions



Bangladesh Army University of Science and Technology

Department of Computer Science and Engineering

Final Examination, Winter 2023

Course Code: CSE 3101 Level-3 Term- I
Time: 03 (Three) hours Full Marks: 180

Course Title: Software Engineering

N.B.
- The questions are of equal value.
- Figures in the margin indicate full marks allotted to each question.
- Symbols and abbreviations bear their standard meaning.
- Use separate answer script for each PART.
- The corresponding course learning outcomes (CLOs) are given in the right most column.

PART- A (Marks: 90)

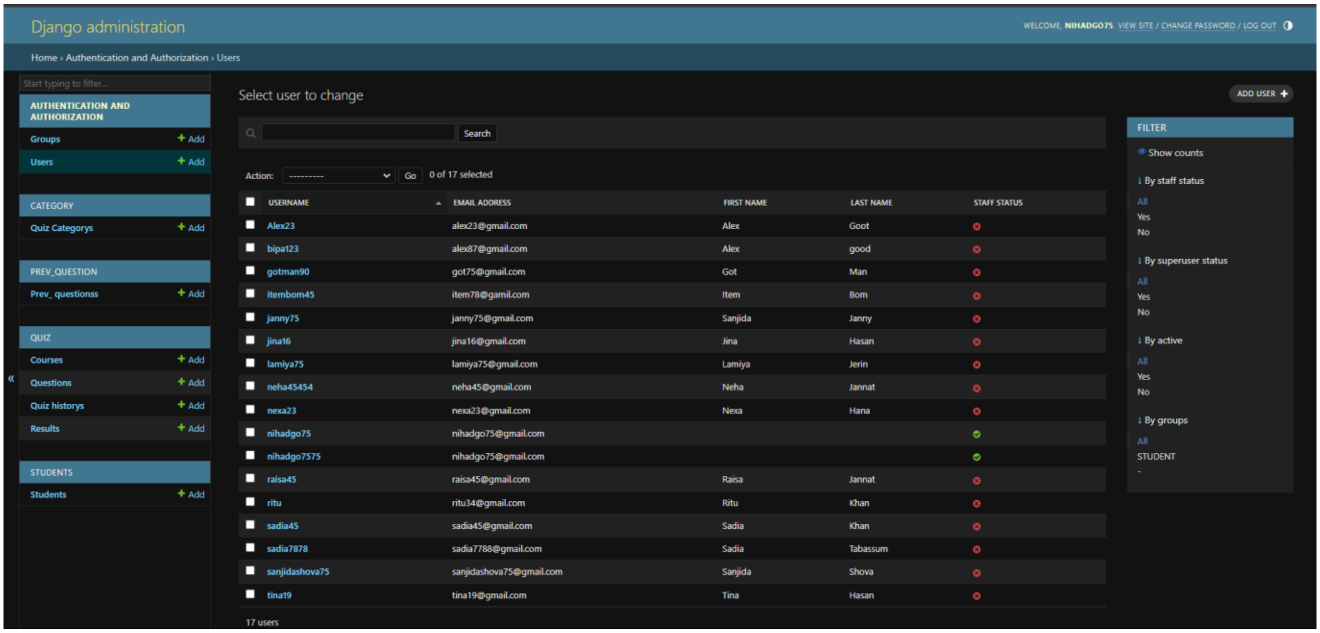
(Answer any three questions including Q. No. 1)

			Marks	CLOs
1.	a)	Define Systems Analysis and Design Life Cycle (SDLC). Write the steps of SDLC in details.	15	CLO1
	b)	Suppose, you are assigned as an analyst in a software company called "ABC Informatics". Describe your roles for the company.	10	CLO1
	d)	Briefly explain the components of information system.	5	CLO1
2.	a)	Write short notes on below topics: i) Diagram model ii) Relationships iii) Association iv) Generalization v) Aggregation	10	
	b)	A popular online shopping app called "Easy Shop". The app involves many customers, seller, admin etc. Moreover, the system performs many actions. Draw a use case diagram of shopping app.	15	
	c)	Briefly describe the elements of use case diagram.	5	
3.	a)	Define design pattern with proper example. Write the types of design pattern.	10	
	b)	Suppose, you are a project manager of "X Technical Solutions", a software development company. Your client is expecting a design of software which can deal with different interfaces for similar behavior. Now answer the questions. i) Determine the best suited design pattern in this situation. ii) Explain the reason behind your choice. iii) Give an example of the pattern with necessary diagram.	15	
	c)	Describe Model View Controller (MVC) with diagram.	5	
4.	a)	Word Statement: "Our company receives many items from several vendors each accompanied by a delivery note. A receiving office receives the item and checks the delivery note with corresponding order. Any discrepancy is reported to purchase office. The items received along with items received note (with details of items) is sent to the inspection office." Prepare document flow diagram from this system requirements specification (SRS).	10	
	b)	Derive the equation of software reliability theory.	15	
	c)	Differentiate between coupling and cohesion with example.	5	

Fig.13 Read Previous Questions

7.Admin Panel (Administration)

The admin panel in a quiz system is like a control center for administrators. They can manage users, quizzes, student performance, reports, and system settings, ensuring smooth operation and valuable insights.

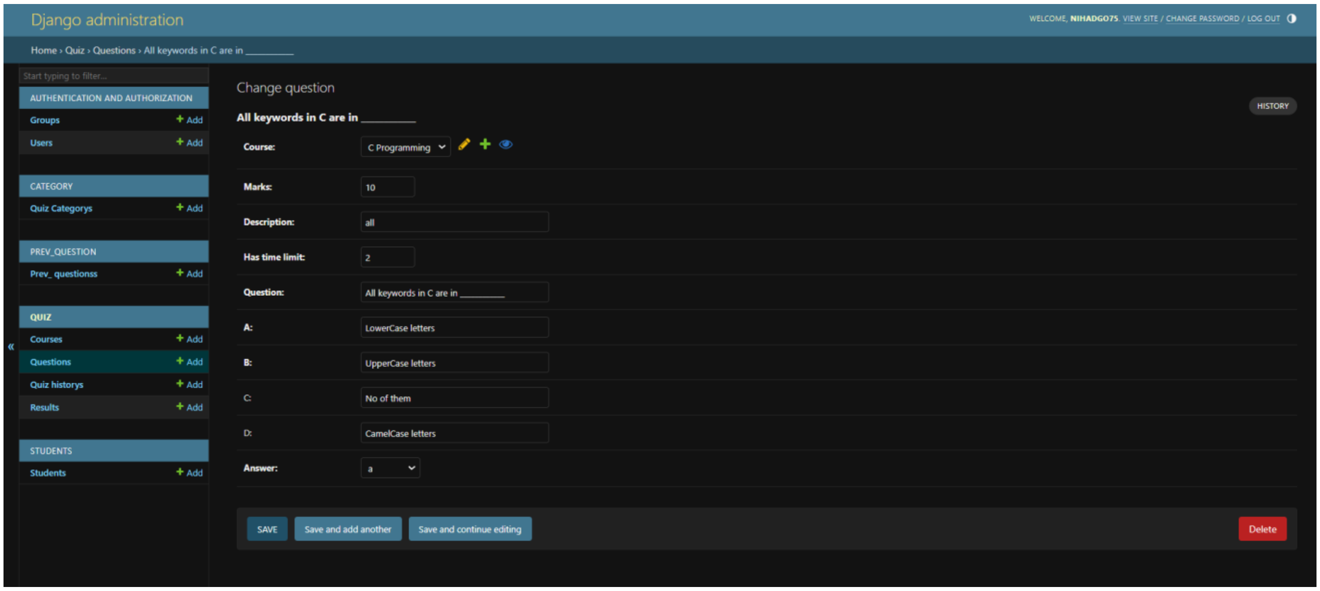


Select user to change

Action: --------- 0 of 17 selected

□	USERNAME	EMAIL ADDRESS	FIRST NAME	LAST NAME	STAFF STATUS
□	Alex23	alex23@gmail.com	Alex	Goot	✗
□	bipa123	alex87@gmail.com	Alex	good	✗
□	gotman90	got75@gmail.com	Got	Man	✗
□	itembom45	item78@gamil.com	Item	Bom	✗
□	janny75	janny75@gmail.com	Sanjida	Janny	✗
□	jina16	jina16@gmail.com	Jina	Hasan	✗
□	lamiya75	lamiya75@gmail.com	Lamiya	Jerin	✗
□	neha45454	neha45@gmail.com	Neha	Jannat	✗
□	nexa23	nexa23@gmail.com	Nexa	Hana	✗
□	nihadgo75	nihadgo75@gmail.com			✓
□	nihadgo7575	nihadgo75@gmail.com			✓
□	raisa45	raisa45@gmail.com	Raisa	Jannat	✗
□	ritu	ritu34@gmail.com	Ritu	Khan	✗
□	sadia45	sadia45@gmail.com	Sadia	Khan	✗
□	sadia7878	sadia7788@gmail.com	Sadia	Tabassum	✗
□	sanjidashova75	sanjidashova75@gmail.com	Sanjida	Shova	✗
□	tina19	tina19@gmail.com	Tina	Hasan	✗

17 users



Change question

All keywords in C are in ________

Course: C Programming
Marks: 10
Description: all
Has time limit: 2
Question: All keywords in C are in ________
A: LowerCase letters
B: UpperCase letters
C: No of them
D: CamelCase letters
Answer: a

Chapter 3: Different Principles Used in the Project

In the development of **AcademiaQuest,** we meticulously adhered to various software design principles to ensure the robustness, scalability, and maintainability of the platform. Let's delve into each principle with examples of how they were applied: **3.1 Single Responsibility Principle (SRP)**

The Single Responsibility Principle states that a class should have only one reason to change, meaning it should have only one responsibility or job within the system. This principle promotes clarity, cohesion, and ease of maintenance in the codebase.

Example: In **AcademiaQuest,** we have separate classes responsible for specific tasks such as user authentication, quiz management, and question retrieval. For instance, the **UserAuthenticationService** class handles user authentication logic, while the **QuizManager** class manages quiz creation, retrieval, and grading. Each class is focused on a single responsibility, making the codebase more modular and easier to understand and modify.

3.2 Open/Closed Principle (OCP)

The Open/Closed Principle states that software entities (classes, modules, functions, etc.) should be open for extension but closed for modification. In other words, existing code should be able to be extended with new functionality without altering its source code.

Example: In **AcademiaQuest,** we achieved the Open/Closed Principle by using inheritance and polymorphism. For instance, when introducing new types of quizzes, instead of modifying the existing **Quiz** class, we create subclasses such as **MultipleChoiceQuiz** and **TrueFalseQuiz** that extend the base **Quiz** class. This allows us to add new quiz types without changing the existing codebase, promoting code reuse and maintainability.

3.3 Liskov Substitution Principle (LSP)

The Liskov Substitution Principle states that objects of a superclass should be replaceable with objects of its subclass without affecting the correctness of the program. In other words, subclasses should be substitutable for their base classes without altering the behavior of the program.

Example: In **AcademiaQuest,** we adhere to the Liskov Substitution Principle by ensuring that subclasses can be used interchangeably with their base classes. For instance, when retrieving questions from the question bank, we can use polymorphism to treat all question types (e.g., multiple-choice, true/false) uniformly. This allows us to seamlessly switch between different question types without needing to modify the code that consumes them.

3.4 Interface Segregation Principle (ISP)

The Interface Segregation Principle states that clients should not be forced to depend on interfaces they do not use. It advocates for the creation of specific, client-focused interfaces rather than large, monolithic interfaces.

Example: In **AcademiaQuest,** we design interfaces tailored to specific client requirements, promoting modularity and flexibility. For example, instead of having a single **IQuestion** interface with methods for all types of questions, we create separate interfaces like **IMultipleChoiceQuestion** and **ITrueFalseQuestion**, each containing methods relevant to its specific question type. This allows clients to depend only on the interfaces they need, reducing unnecessary dependencies and promoting code cohesion.

3.5 Dependency Inversion Principle (DIP)

The Dependency Inversion Principle states that high-level modules should not depend on lowlevel modules but should depend on abstractions. It advocates for decoupling high-level modules from the implementation details of low-level modules, promoting flexibility and testability.

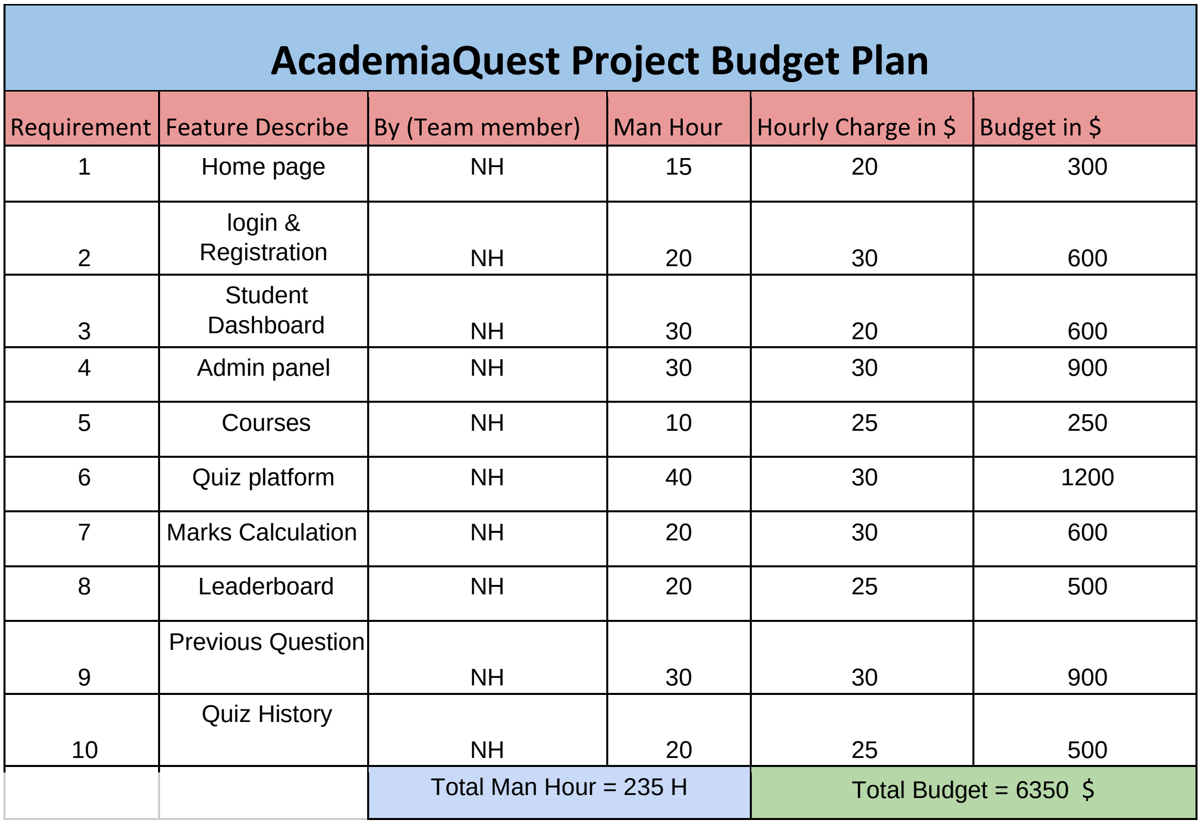
Example: In **AcademiaQuest,** we apply the Dependency Inversion Principle by using dependency injection to invert the dependencies between high-level and low-level modules. For example, instead of directly instantiating database access objects in the **QuizManager** class, we inject them as dependencies via constructor injection. This allows us to easily substitute different database implementations or mock objects for testing purposes without modifying the **QuizManager** class, enhancing modularity and testability.

By diligently applying these principles throughout the development of **AcademiaQuest,** we ensure that the platform is well-designed, maintainable, and adaptable to future changes and enhancements. Each principle contributes to the overall quality and reliability of the software, fostering a codebase that is robust, scalable, and resilient to change.

Chapter 4: Project Time and Budge Management

Effective time and budget management are critical components of project success. Throughout the development lifecycle of **AcademiaQuest**, we meticulously planned and monitored our resources to ensure optimal utilization and adherence to project timelines.

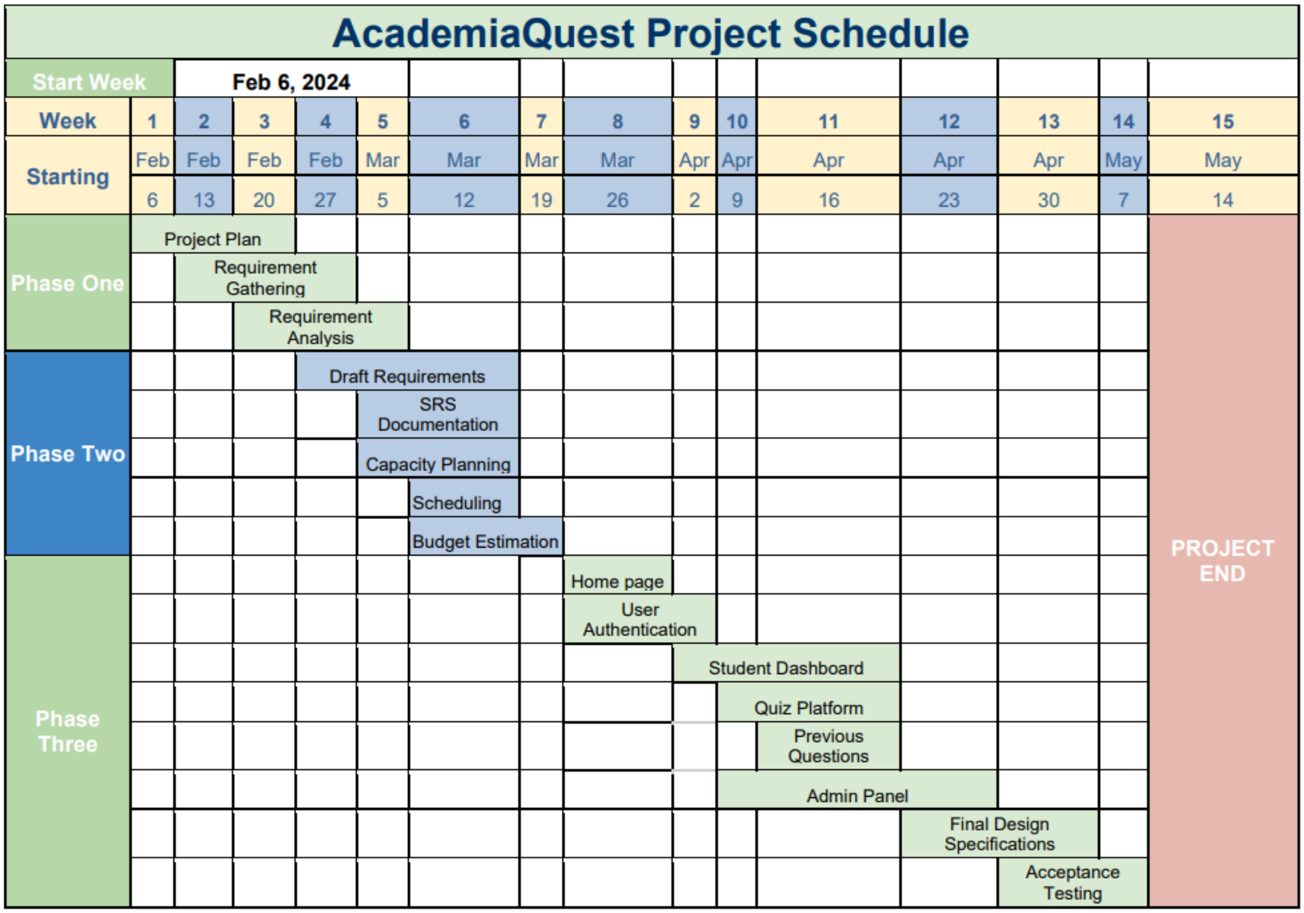
The following table provides an overview of our planned and actual time allocation and budget expenditure:



AcademiaQuest Project Budget Plan

Requirement	Feature Describe	By (Team member)	Man Hour	Hourly Charge in $	Budget in $
1	Home page	NH	15	20	300
2	login & Registration	NH	20	30	600
3	Student Dashboard	NH	30	20	600
4	Admin panel	NH	30	30	900
5	Courses	NH	10	25	250
6	Quiz platform	NH	40	30	1200
7	Marks Calculation	NH	20	30	600
8	Leaderboard	NH	20	25	500
9	Previous Question	NH	30	30	900
10	Quiz History	NH	20	25	500
		Total Man Hour = 235 H		Total Budget = 6350 $	

Fig.14 Budget Plan



AcademiaQuest Project Schedule

Start Week: Feb 6, 2024

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Starting	Feb 6	Feb 13	Feb 20	Feb 27	Mar 5	Mar 12	Mar 19	Mar 26	Apr 2	Apr 9	Apr 16	Apr 23	Apr 30	May 7	May 14
Phase One	Project Plan														PROJECT END
		Requirement Gathering													
			Requirement Analysis												
Phase Two				Draft Requirements											
					SRS Documentation										
					Capacity Planning										
						Scheduling									
						Budget Estimation									
Phase Three								Home page							
								User Authentication							
									Student Dashboard						
										Quiz Platform					
											Previous Questions				
										Admin Panel					
												Final Design Specifications			
													Acceptance Testing		

Chapter 5: Conclusion

In conclusion, AcademiaQuest represents a testament to the power of innovation, collaboration, and commitment to excellence. By harnessing the latest advancements in technology and adhering to the principles of software engineering, we have created a platform that transcends the boundaries of traditional education.

As we embark on this transformative journey, we remain steadfast in our dedication to empowering learners, enriching educational experiences, and shaping the future of learning. With AcademiaQuest, the quest for knowledge knows no bounds, and the pursuit of excellence becomes an exhilarating adventure.