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WE WILL RISE UP
WE WILL SHINE

147/I, Green Road, Panthapath, Dhaka-1205

Online Based MCQ Exam System

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This Project has been submitted to the Department of Computer Science & Engineering at Sonargaon University in the partial fulfillment of the requirement for the degree of Bachelor of Science in Computer Science & Engineering.

May, 2019

Declaration

We are Golam Azam, Md. Saleh Sadik, Mohammad Ansarullah Al Mahmud and Momotaj Begum students of Department of Computer Science and Engineering, Sonargaon University (SU), declaring that this project paper on the stated topic has only been prepared for the fulfillment of CSE- 400 Project/Thesis, as the partial fulfillment of "Bachelor of Computer Science and Engineering" degree.

It has not been prepared for any other purposes, rewards, or presentation.

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Acceptance

This is to certify that Project report on **"Online Based MCQ Exam System"** has been carried out by Golam Azam ID: CSE1502005021, Md. Saleh Sadik ID: CSE1502005049, Mohammad Ansarullah Al Mahmud ID: CSE1501004012 and Momotaj Begum ID: CSE1502005016, students of Department of Computer Science and Engineering, Sonargaon University (SU) as a partial fulfillment of the requirement of CSE-400 Project/Thesis. The report has been prepared under my guidance. To the best of my knowledge and as per their declaration, no parts of this report has been submitted anywhere for any degree, diploma or certificate.

Now they are permitted to submit the report. I wish their all success in their future endeavors.

Project Supervisor



Md. Monzurul Amin Ifath
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Acknowledgement

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We are very appreciative to **Bulbul Ahamed**, Head of Department of computer Science and Engineering, Sonargaon University for his unrelenting direction and sustain throughout the semester.

We would like to thanks our families, friends for their mental support throughout this work. We would also like to thank our Vice Chancellor **Professor M.A Razzaque** who has given us the opportunity to study in such a decent environment.

Our success could not turn into reality without these people who help us in different ways. We also like to thank all of our friends for their valuable suggestion and comments.

Objective

To make an interactive, visually appealing and technologically advanced MCQ website for the student and others to help them practice, improve and compete with others in today's competitive world.

Table of Contents

Declaration i

Acceptance ii

Acknowledgement iii

Objective iv

Chapter 01: Introduction 1

1.1 Introduction of Project 2

1.2 Aim of Project 2

1.3 System Study and Analysis 2

1.3.1 System Analysis 2

1.4 Methodology of Our Work 2

1.4.1 Agile 3

1.4.2 Reason of Using Agile Methodology 4

1.4.3 Advantages of Agile Method 5

1.4.4 Disadvantages of Agile Method 5

Chapter 02: Existing System 6

2.1 Analysis of Existing System 7

Chapter 03: Proposed System & Design 10

3.1 Aim of the Proposed System 11

3.1.1 Advantage of the Proposed System 11

3.2 System Feasibility Study 11

3.2.1 Technical Feasibility 12

3.2.2 Economic Feasibility 12

3.2.3 Legal Feasibility 12

3.2.4 Operational Feasibility 12

3.2.5 Scheduling Feasibility 12
3.3 Benefits of Conducting a Feasibility Study 12
3.4 Proposed System Design 13
3.4.1 Logical Design 13
3.4.2 Physical Design 13
3.5 Use Case Diagram 14
Chapter 04: Implementation of Model 15
4.1 Analysis Modeling, Design Methodologies & Description 16
4.1.1 Database Design 16
4.1.2 Entity Relationship Model 16
4.1.3 Identifying Entities 16
4.1.4 Introduction of Entity Relationship Diagram 16
4.1.5 Relationship Cardinality 16
4.1.6 Diagram of Entity Relationship Diagram 17
4.1.7 Introduction of Data Flow Diagram 18
4.1.8 Symbol of Data Flow Diagram 19
4.1.9 Data Flow Diagram of the Project 20
4.1.10 Activity Diagram of User 25
4.1.11 Activity Diagram of Admin 26
4.1.12 Sequence Diagram (Admin) 27
4.1.13 Sequence Diagram (User) 28
4.2 System Requirements and Cost 32
4.2.1 Hardware Requirements 32
4.2.2 Software Requirements 32
4.2.3 Project Cost Estimation 32
Chapter 05: Risk Management 34
5.1 Risk Management 35
5.2 The Risk Management Plan 35
Chapter 06: System Implementation 38
6.1 System Implementation and Testing 39

6.1.1 Testing Strategies 39
6.2 Implementation 40
6.3 Database Table Structure 41
6.4 Screenshots 41
6.5 Codes 50
Chapter 07: System Quality Management 66
7.1 Quality Management 67
7.1.1 Quality Management Activities 67
7.1.1.1 Quality Assurance 67
7.1.1.2 Quality Planning 67
7.1.1.3 Quality Control 67
Chapter 08: Conclusion 69
8.1 The Experience 70
8.2 Future Work 70
8.3 Conclusion 70
8.4 Acronyms 70
8.5 References 71

Chapter 01: Introduction

1.1 Introduction of Project

Online based MCQ system is a website that is specifically designed for the students to practice MCQ. It has a different type of functionality to meet a student's MCQ needs. Online based MCQ system is a system where the user can find MCQ exams in different formats like Practice, Special exam with a specific number of students at a time also One vs One exam. Online based MCQ system also provides a Social Platform including chat, friend options and an enriched forum.

1.2 Aim of Project

MCQ exam system or Multiple Choice Question is a very important part of our country's existing exam system. The conventional textbook doesn't have enough sample questions and doesn't provide any sort of practicing exercise. In this digitalized era, all of the students have access to a digital device like a Smart Phone or Computer. This online based MCQ system provide them a way to practice and compete in a platform just like any other multiplayer online gaming platform. Also, there are social platform embedded with the system so that the user can send and accept the friend request and chat with them. The Goal of the system is to provide an online based MCQ system where the user can interact and give exam like playing games and learn with the process of playing games.

1.3 System Study and Analysis

1.3.1 System Analysis

Systems analysis is a process of looking at end-user implementation of a software package or product; looking in-depth at source code to define the methodologies used in building software; or taking feasibility studies and other types of research to support the use and production of a software product, among other things. methodologies used in building software; or taking feasibility studies and other types of research to support the use and production of a software product, among other things. [1] System analysis is a process of gathering and interpreting facts, diagnosing problems and the information to recorded improvements on the system. It is a problem solving activity that requires intensive communication between the system user and system developer. System analysis or study is an important phase of any system development process. A detailed study of the process must be made by various techniques like interviews, questionnaires etc. The data collected by these sources must be scrutinized to arrive to conclusion every synthesis is built upon the results of a preceding analysis and every analysis requires a subsequent. [2]

1.4 Methodology of Our Work

A system of methods used in a particular area of study or activity. Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. Typically, it encompasses concepts such as paradigm, theoretical model, phases

and quantitative or qualitative techniques. A methodology does not set out to provide solutions—it is therefore, not the same as a method. Instead, a methodology offers the theoretical underpinning for understanding which method, set of methods, or best practices can be applied to a specific case, for example, to calculate a specific result.

The methodology is the general research strategy that outlines the way in which research is to be undertaken and, among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated. Methodology does not define specific methods, even though much attention is given to the nature and kinds of processes to be followed in a particular procedure or to attain an objective. [3]

There are various types of methodology available. However, we choose to use AGILE method for our project Online Based MCQ System.

1.4.1 Agile

One of the more recognizable project management methodologies, Agile is best suited for projects that are iterative and incremental. It's a type of process where demands and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customers. Originally created for software development, it was established as a response to the inadequacies of the Waterfall method (info on it later below), the processes of which did not meet the demands of the highly competitive and constant movement of the software industry.

Agile project management stems from the values and principles of the Agile Manifesto. A declaration cemented in 2001 by 13 industry leaders, its purpose is to uncover better ways of developing software by providing a clear and measurable structure that fosters iterative development, team collaboration, and change recognition.

There are some specific values and principles in Agile method. Those are given below:

Values

1. Individuals and interactions over processes and tools
2. Working software over comprehensive documentation
3. Customer collaboration over contract negotiation
4. Responding to change over following a plan

Principles

1. Customer satisfaction through early and continuous software delivery
2. Accommodate changing requirements throughout the development process
3. Frequent delivery of working software
4. Collaboration between the business stakeholders and developers throughout the project
5. Support, trust, and motivate the people involved
6. Enable face-to-face interactions
7. Working software is the primary measure of progress
8. Agile processes to support a consistent development pace
9. Attention to technical detail and design enhances agility
10. Simplicity

11. Self-organizing teams encourage great architectures, requirements, and designs
12. Regular reflections on how to become more effective

Because of its addictiveness, Agile methodology is commonly used to deliver more complex projects. It uses six main deliverables to track progress and create the product which are the product vision statement, product roadmap, product backlog, release plan, Sprint backlog, and increment. With these features, it establishes itself as a methodology that places an emphasis on collaboration, flexibility, continuous improvement, and high quality results.[4]

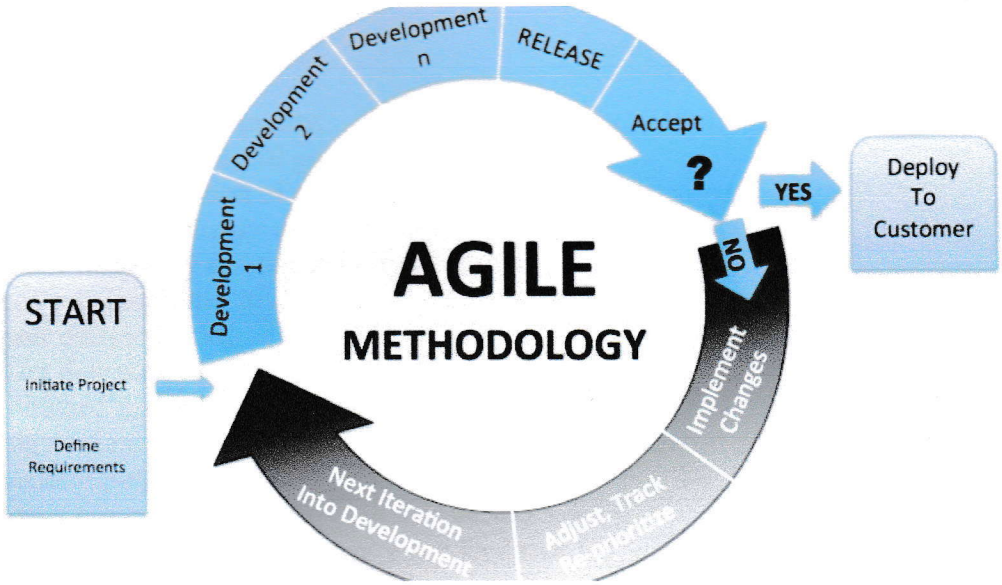

Figure 1.4.1.1: Agile Methodology

This methodology works in a very simple way by breaking down the Project into smaller part and continuously delivering them in a cycle called iterations.

1.4.2 Reason of Using Agile Methodology

Software project management is a discipline where we may need to coordinate many various projects of different scope and deal with different customers who need different results. Naturally, we will not be able to use the same management methods for delivering a basic application developed by a team of four and a complex software solution which needs professionals from various departments.

Besides, most customers will require us to yield results along the project, so that they can see what kind of product they will get at the end. To be a successful project manager, we need to master different software delivery methodologies. Basically, there are two of them widely used in software development: Waterfall and Agile.

Agile Manifesto was put together back in 2001 by a group of developers utilizing different delivery methods. Eleven years after, a study by the Standish group was conducted showing that Agile methods yield successful projects three times more often compared to the traditional Waterfall projects. The gist of Agile trade is to continually develop shippable software pieces

to our client. Along the way, our client monitors progress, gives feedback and supervises direction of your work.

Unlike Waterfall methodology which takes a rigid, sequential structure, Agile methods are more flexible and involve constant cooperation with the client.[5]

1.4.3 Advantages of Agile Method

- More flexibility
- More productivity;
- More transparency;
- Products of superior quality;
- Decreased risk of missed goals;
- Faster implementation of solutions;
- Waste reduction thanks to the minimization of the resources;
- Greater flexibility and adaptability to change;
- More success thanks to more focused efforts;
- Faster delivery times;
- Faster detection of problems and defects;
- Optimized development processes;
- A lighter/less complicated structure;
- Excellent project control;
- Greater attention to specific customer needs;
- Increased collaboration frequency and feedback.[6]

1.4.4 Disadvantages of Agile Method

- In case of some software deliverables, especially the large ones, it is difficult to assess the effort required at the beginning of the software development life cycle.
- There is lack of emphasis on necessary designing and documentation.
- The project can easily get taken off track if the customer representative is not clear what final outcome that they want.
- Only senior programmers are capable of taking the kind of decisions required during the development process. Hence it has no place for newbie programmers, unless combined with experienced resources. [7]

Chapter 02: Existing System

2.1 Analysis of Existing System

To start a project one of the major part is to research the existing system. There are several sites that offer MCQ exam on their website. Some of them are good in their own way and some of them are not so good. The existing system and their merits and their demerits are given below.

https://mcqcontest.com

Merits:

1. Have facilities to practice for BCS, admission test as well as Preparation for Job
2. Lottery System
3. Timing System

Demerits:

1. Answer can be changed by going back
2. There is no fixed time



Figure 2.1.1: https://mcqcontest.com

https://jobtestbd.com/question-cat/bangla/

Merits:

1. Examinee can answer only once as per question

Demerits:

1. Wrong answer is being showed instantly.
2. No privacy
3. No timing system available

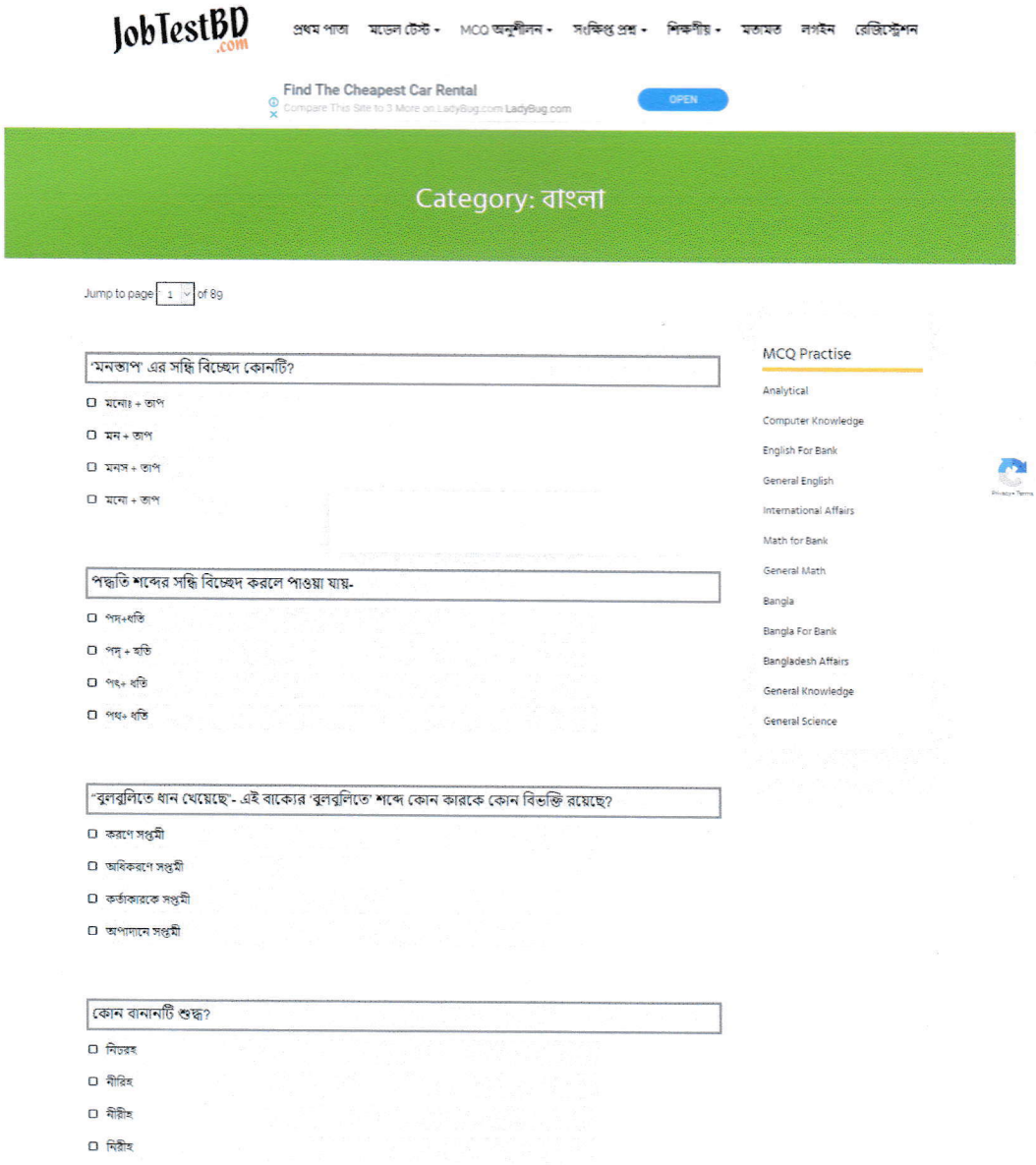

Figure 2.1.2: https://jobtestbd.com/question-cat/bangla/

completely change a project's scope. It's best to make these determinations in advance, rather than to jump in and learning that the project just won't work. Conducting a feasibility study is always beneficial to the project as it gives you and other stakeholders a clear picture of the proposed project.

Below are some key benefits of conducting a feasibility study:

- Improves project teams' focus
- Identifies new opportunities
- Provides valuable information for a "go/no-go" decision
- Narrows the business alternatives
- Identifies a valid reason to undertake the project
- Enhances the success rate by evaluating multiple parameters
- Aids decision-making on the project
- Identifies reasons not to proceed

Apart from the approaches to feasibility study listed above, some projects also require other constraints to be analyzed -

Internal Project Constraints: Technical, Technology, Budget, Resource, etc.
Internal Corporate Constraints: Financial, Marketing, Export, etc.
External Constraints: Logistics, Environment, Laws and Regulations, etc.[9]

3.4 Proposed System Design

There are two parts in our project, Those are Logical Design and Physical Design. Design of our proposed system is given below:

3.4.1 Logical Design

The logical flow of a system and define the boundaries of a system. It includes the following steps:

- Reviews the current physical system, data flows, file content, other content etc.
- Prepares output specifications, determines the format, content and other content.
- Prepare input specifications, format, content and most of the input functions.
- Prepares edit, security and control specifications.
- Specifies the implementation plan.
- Prepares a logical design walk through of the information flow, output, input, controls and implementation plan.
- Reviews benefits, costs, target dates and system constraints.

3.4.2 Physical Design

Physical system produces the working systems by define the design specifications that tell the programmers exactly what the candidate system must do. It includes the following steps.

- Design the physical system.
- Specify input and output media.

- Design the database and specify backup procedures.
- Design physical information flow through the system and a physical design.
- Plan system implementation.
- Determine training procedures, courses and timetable.
- Update benefits, costs, and conversion date and system constraints.

3.5 Use Case Diagram

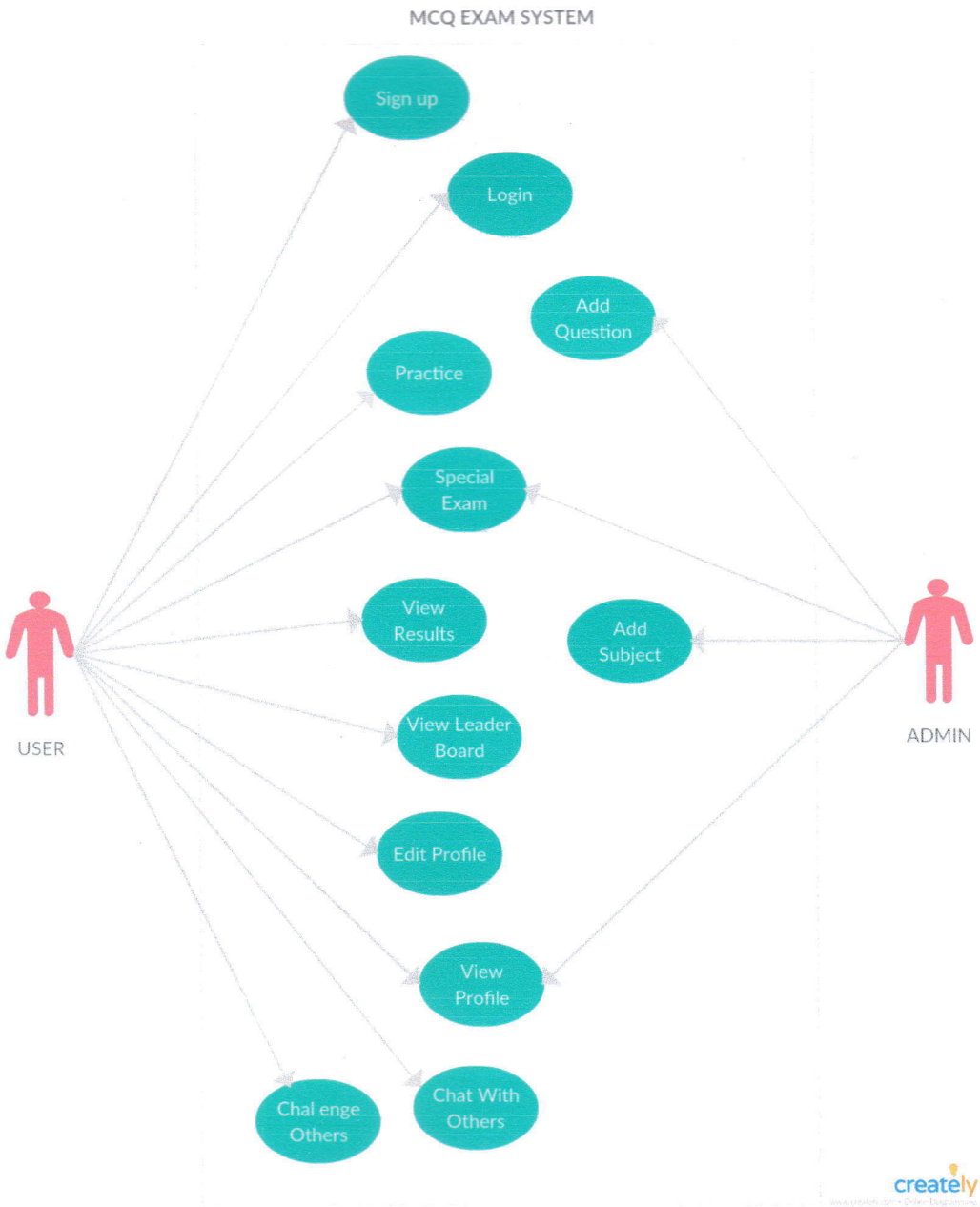

Figure 3.5.1: Use Case Diagram

Chapter 04: Implementation of Model

4.1 Analysis Modeling, Design Methodologies & Description

4.1.1 Database Design

Database design is the process of producing a detailed data model of database. This data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a data definition language, which can then be used to create a database. A fully attributed data model contains detailed attributes for each entity. The term database design can be used to describe many different parts of the design of an overall database system. Principally, and most correctly, it can be thought of as the logical design of the base data structures used to store the data. In the relational model these are the tables and views. In an
object database the entities and relationships map directly to object classes and named relationships. However, the term database design could also be used to apply to the overall process of designing, not just the base data structures, but also the forms and queries used as part of the overall database application within the database management system (DBMS).[9]

4.1.2 Entity Relationship Model

An entity-relationship model (ERM) is a theoretical and conceptual way of showing data relationships in software development. ERM is a database modeling technique that generates an abstract diagram or visual representation of a system's data that can be helpful in designing a relational database. These diagrams are known as entity-relationship diagrams, ER diagrams or ERDs. [10]

4.1.3 Identifying Entities

The entities of our projects are given below:

mcqquestion, prtotal, challenges, specialexam, spquestion, practice, checkans, info, user, spresult, subject, msg, question, answer, request, notification.

4.1.4 Introduction of Entity Relationship Diagram

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties.
By defining the entities, their attributes, and showing the relationships between them, an ER diagram illustrates the logical structure of databases.
ER diagrams are used to sketch out the design of a database. [11]

4.1.5 Relationship Cardinality

Relationship Cardinality have three degree, they are given below:
1. One to One (1:1)
2. One to Many (1:M)
3. Many to Many (M:N)

4.1.6 Diagram of Entity Relationship Diagram

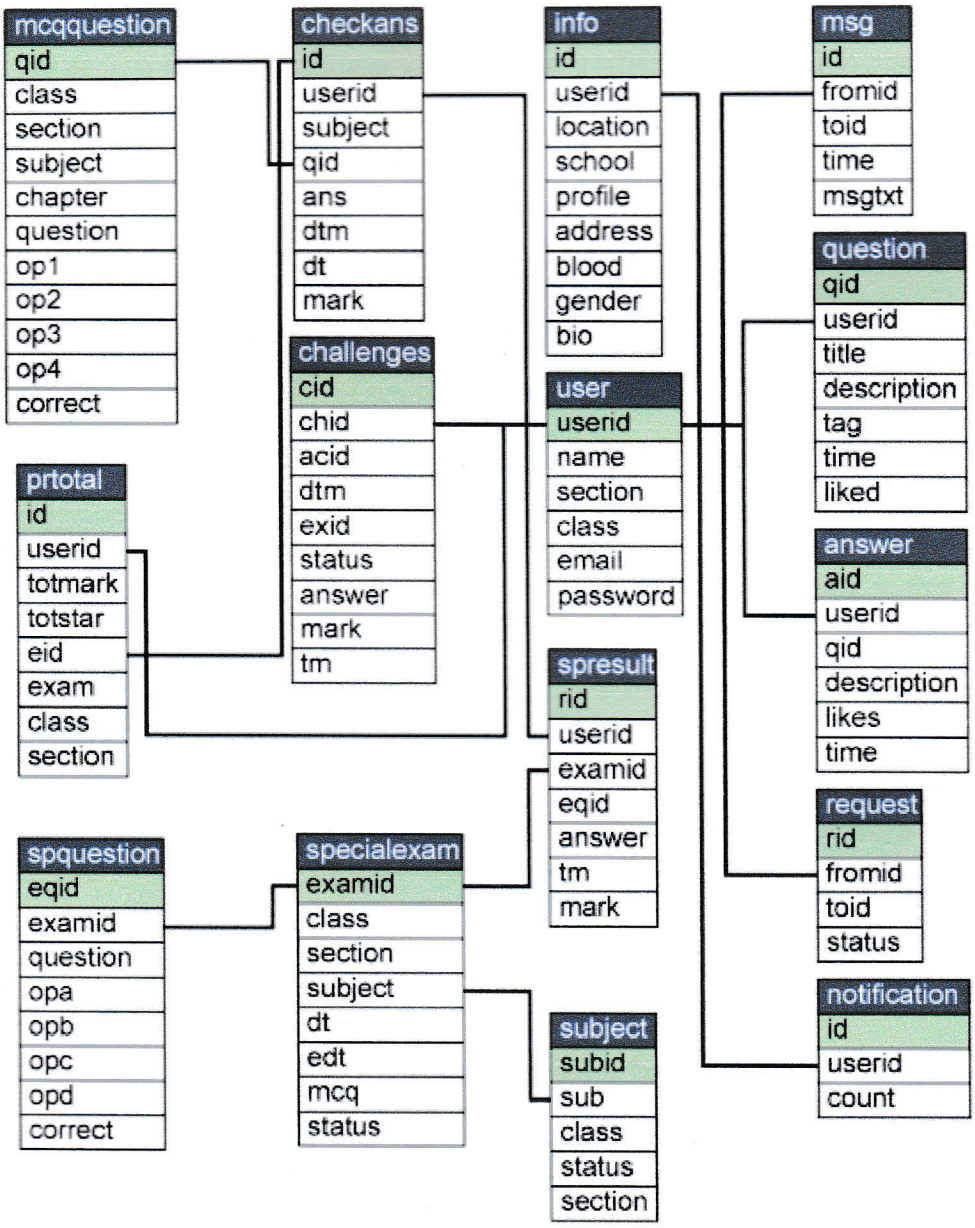

Figure 4.1.6.1: ER-Diagram

4.1.7 Introduction of Data Flow Diagram

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination. Data flowcharts can range from simple, even hand-drawn process overviews, to in-depth, multi-level DFDs that dig progressively deeper into how the data is handled. They can be used to analyze an existing system or model a new one. Like all the best diagrams and charts, a DFD can often visually "say" things that would be hard to explain in words, and they work for both technical and nontechnical audiences, from developer to CEO. That's why DFDs remain so popular after all these years. While they work well for data flow software and systems, they are less applicable nowadays to visualizing interactive, real-time or database-oriented software or systems.[12]

Four basic elements are used to construct data-flow diagrams:

- Processes
- Data-flows
- Data stores
- External entities

Process: Processes are the essential activities, carried out within the system boundary, that use information. A process is represented in the model only where the information which provides the input into the activity is manipulated or transformed in some way, so that the data-flowing out of the process is changed compared to that which flowed in.

The activity may involve capturing information about something that the organisation is interested in, such as a customer or a customer's maintenance call. It may be concerned with recording changes to this information, a change in a customer's address for example. It may require calculations to be carried out, such as the quantity left in stock following the allocation of stock items to a customer's job; or it may involve validating information, such as checking that faulty equipment is covered by a maintenance contract.

Data Flows: A data-flow represents a package of information flowing between two objects in the data-flow diagram. Data-flows are used to model the flow of information into the system, out of the system, and between elements within the system.

Occasionally, a data-flow is used to illustrate information flows between two external entities, which is, strictly speaking, outside of the system boundaries. However, knowledge of the transfer of information between external entities can sometimes aid understanding of the system under investigation, in which case it should be depicted on the diagram.

Data Stores: A data store is a place where data is stored and retrieved within the system. This may be a file, Customer Contracts file for example, a catalogue or reference list, Options Lists for example, a log book such as the Job Book, and so on.

External Entities: External entities are entities outside of the system boundary which interact with the system, in that they send information into the system or receive information from it. External entities may be external to the whole organization — as in Customer and Supplier in our running example; or just external to the application area where users' activities are not

directly supported by the system under investigation. Accounts and Engineering are shown as external entities as they are recipients of information from the system. Sales also provide input to the system.

External entities are often referred to as sources and sinks. All information represented within the system is sourced initially from an external entity. Data can leave the system only via an external entity.[13]

4.1.8 Symbol of Data Flow Diagram

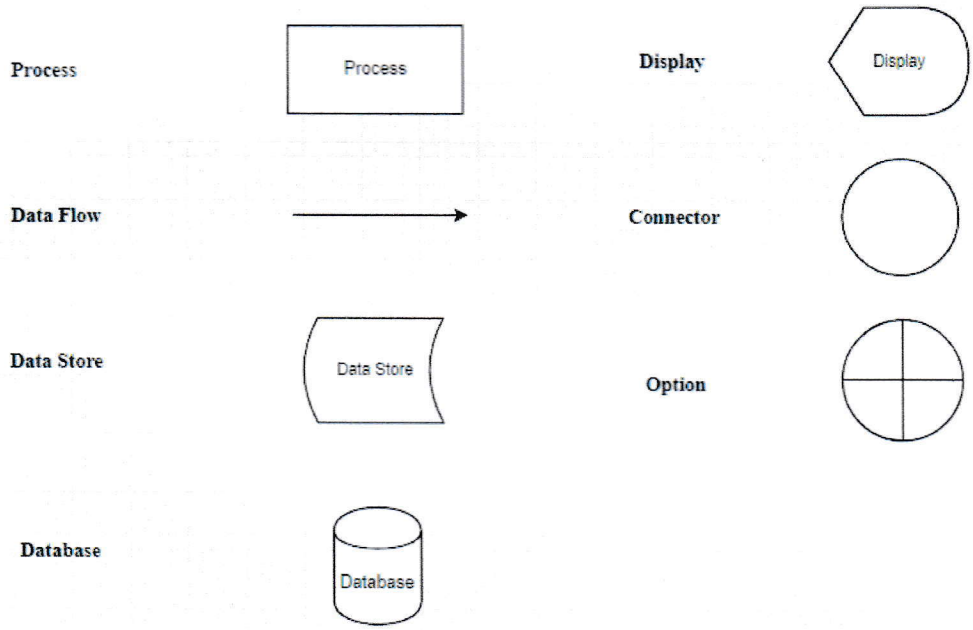

Figure 4.1.8.1: Symbol of data flow diagram

4.1.9 Data Flow Diagram of the Project

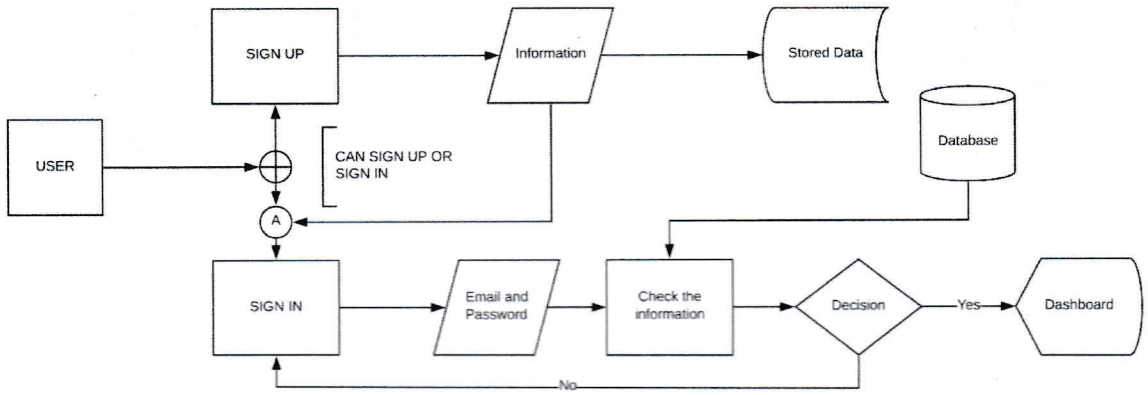

Figure 4.1.9.1: Data flow diagram for User (registration and login)

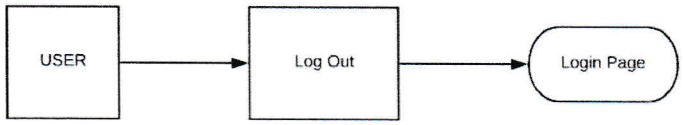

Figure 4.1.9.2: Data flow diagram for User (Log out)

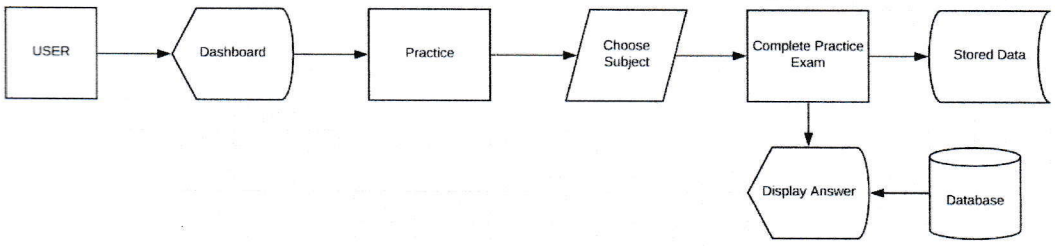

Figure 4.1.9.3: Data flow diagram for User (Practice)

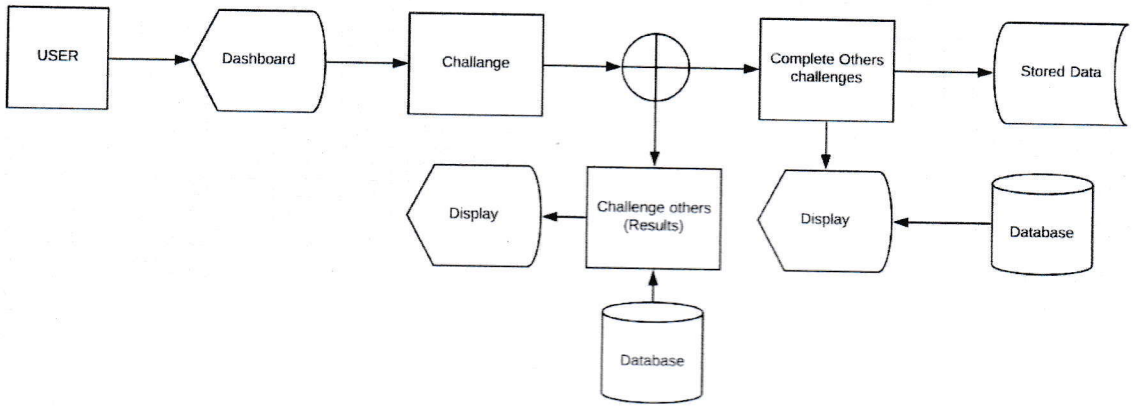

Figure 4.1.9.4: Data flow diagram for User (Challenge Exam)

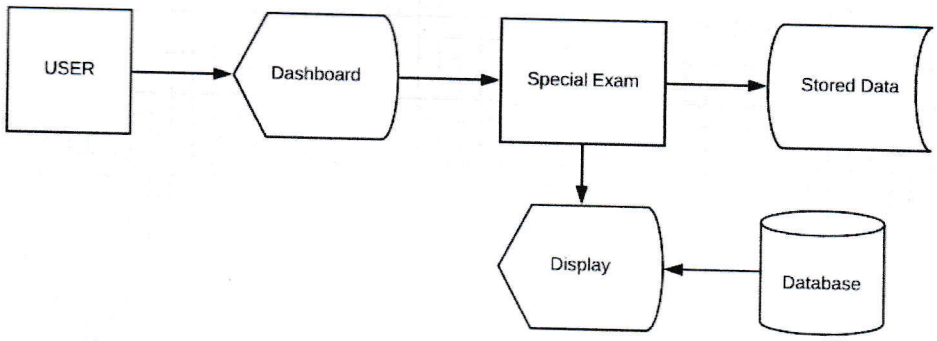

Figure 4.1.9.5: Data flow diagram for User (Special Exam)

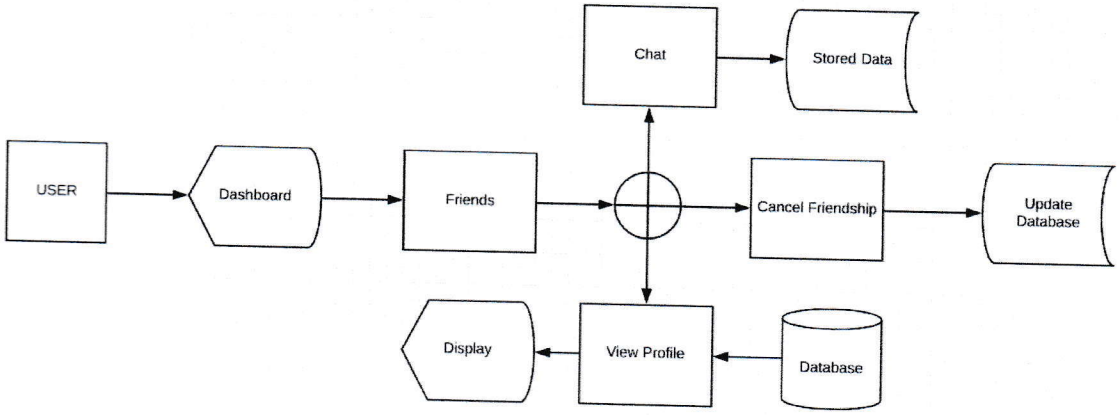

Figure 4.1.9.6: Data flow diagram for User (Friendship)

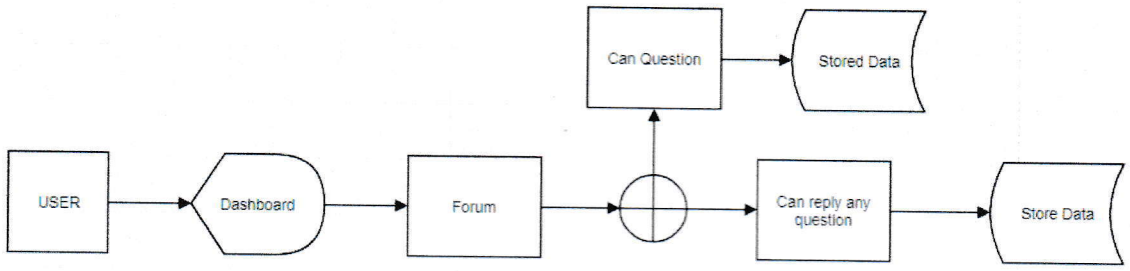

Figure 4.1.9.7: Data flow diagram for User (Forum)

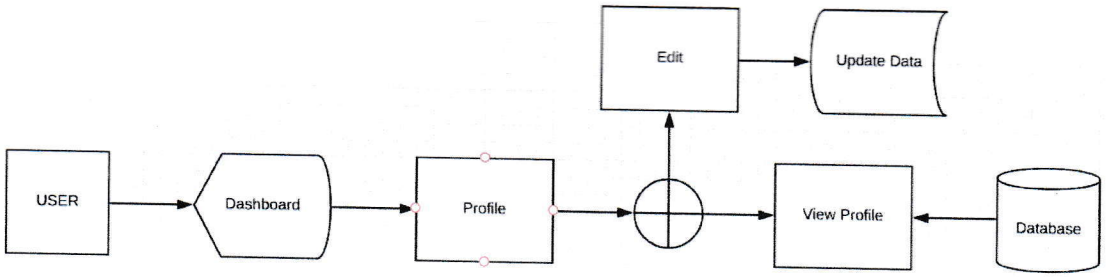

Figure 4.1.9.8: Data flow diagram for User (Edit Profile)

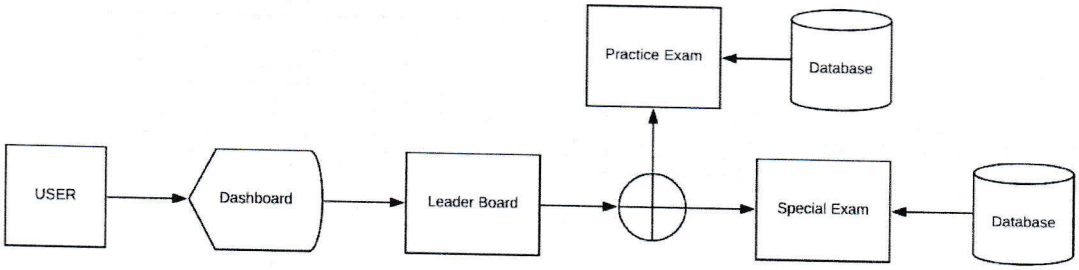

Figure 4.1.9.9: Data flow diagram for User (Leader Board)

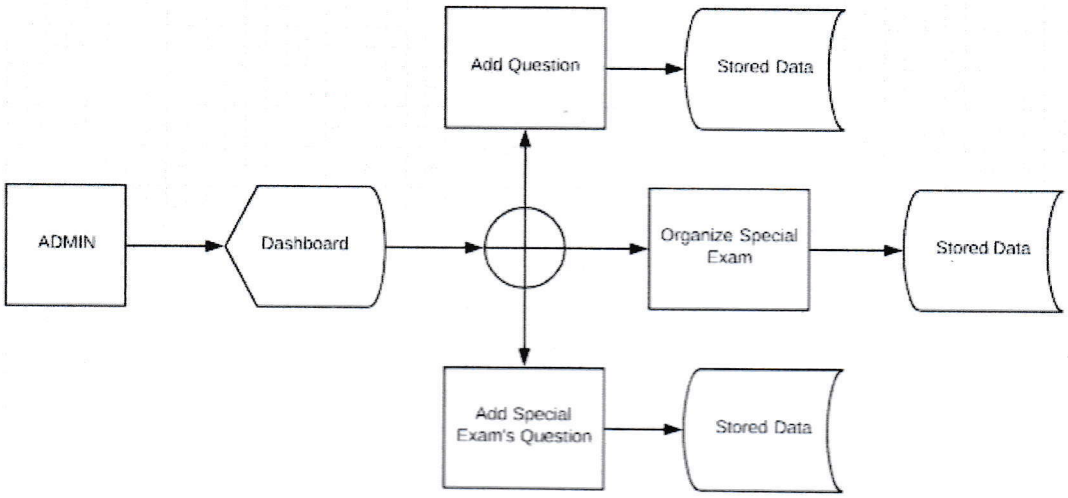

Figure 4.1.9.10: Data flow diagram for Admin.

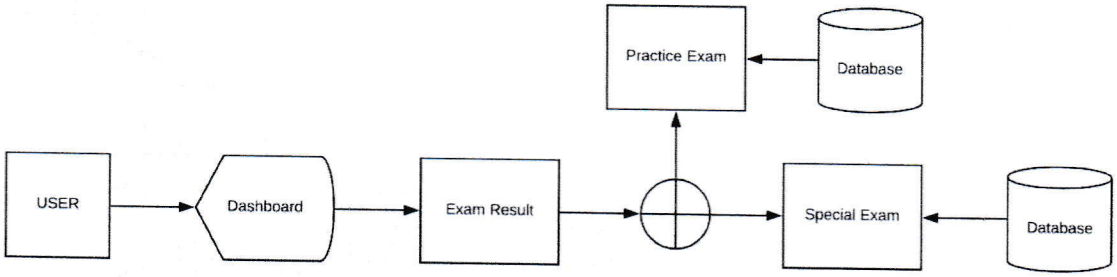

Figure 4.1.9.11: Data flow diagram for Admin.

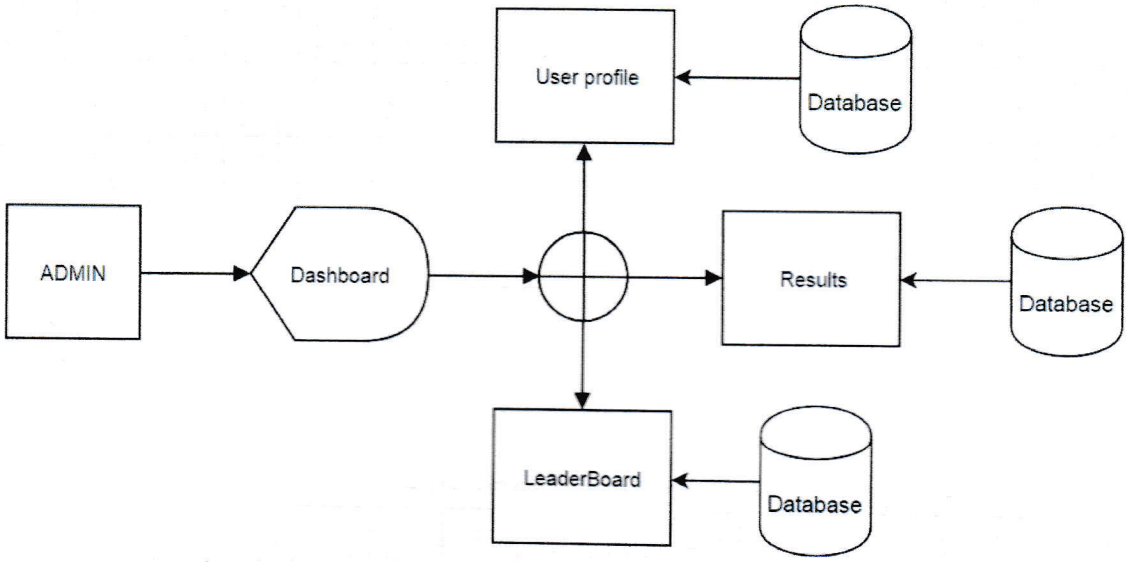

Figure 4.1.9.12: Data flow diagram for Admin.

4.1.10 Activity Diagram of User

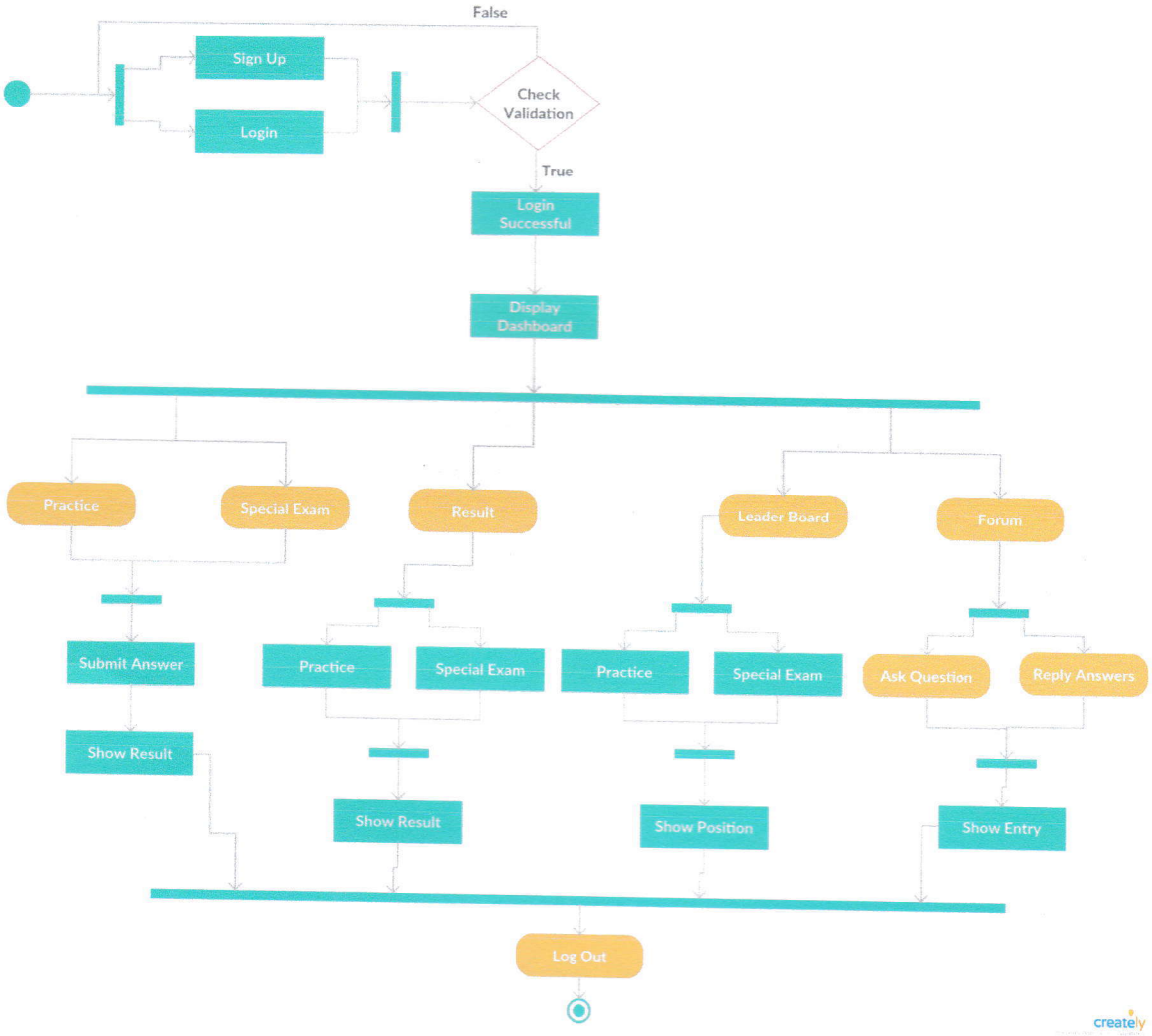

Figure 4.1.10.1- Activity Diagram of User

4.1.11 Activity Diagram of Admin

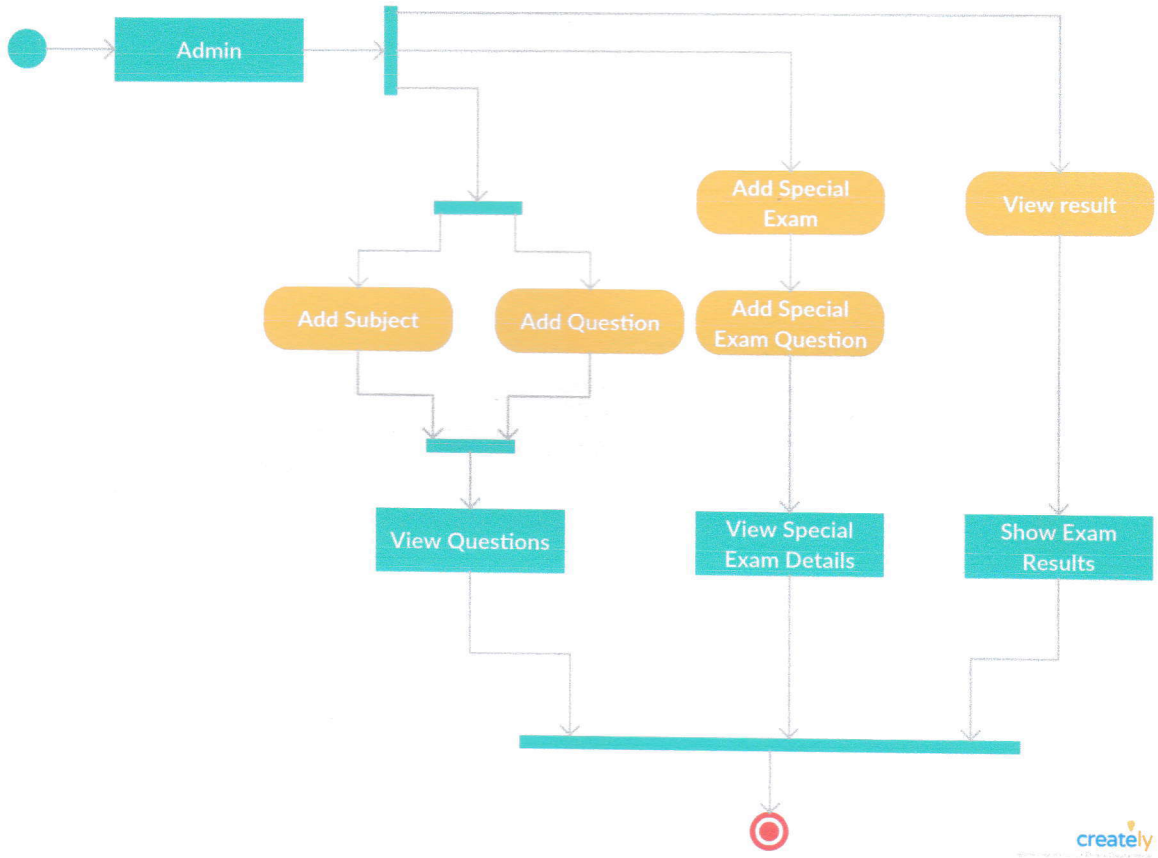

Figure 4.1.11.1- Activity Diagram of Admin

4.1.12 Sequence Diagram (Admin)

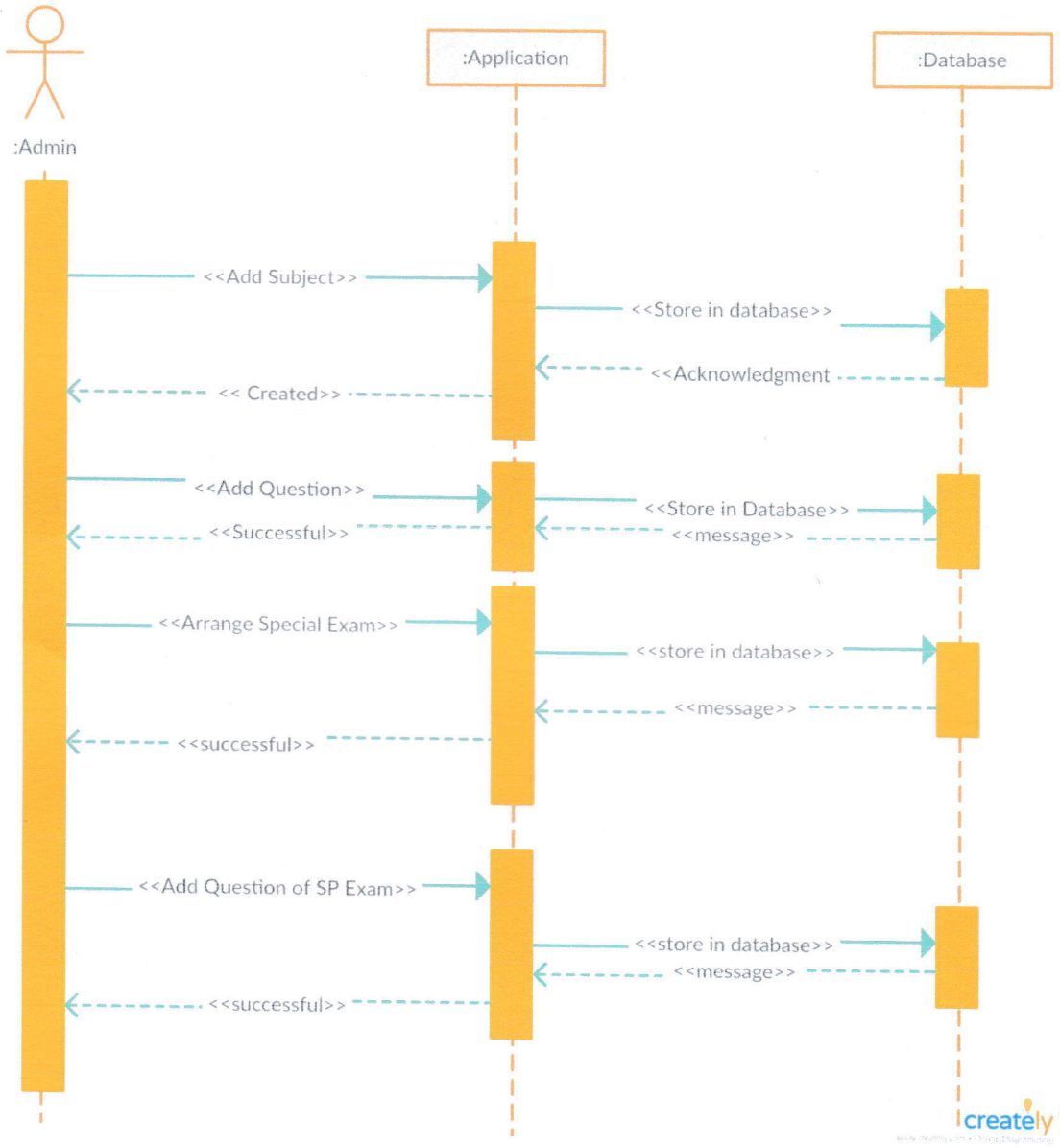

Figure 4.1.12.1- Sequence Diagram of Admin

4.1.13 Sequence Diagram (User)

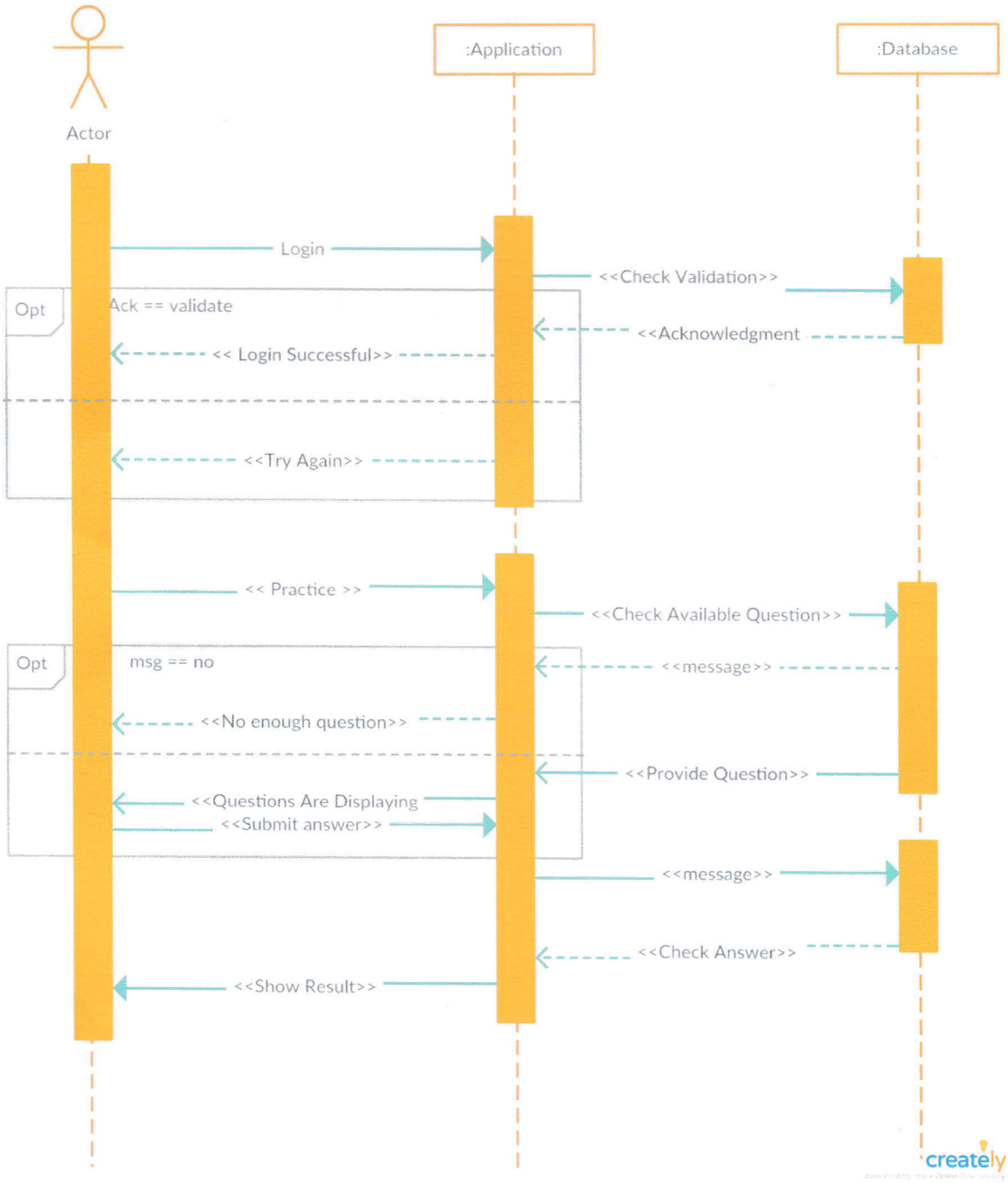

Figure 4.1.13.1- Sequence Diagram of User(Practice)

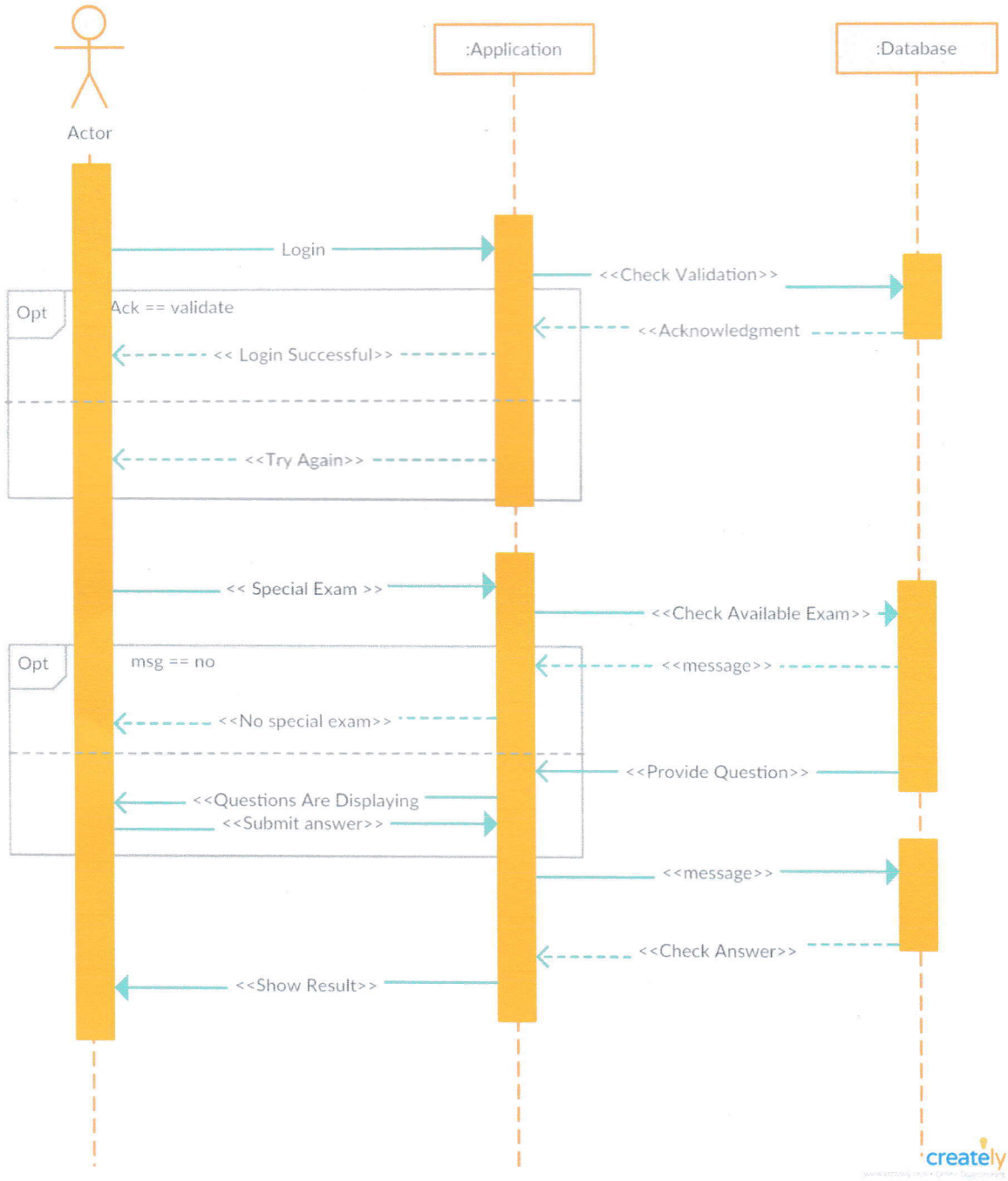

Figure 4.1.13.2- Sequence Diagram of User (Special Exam)

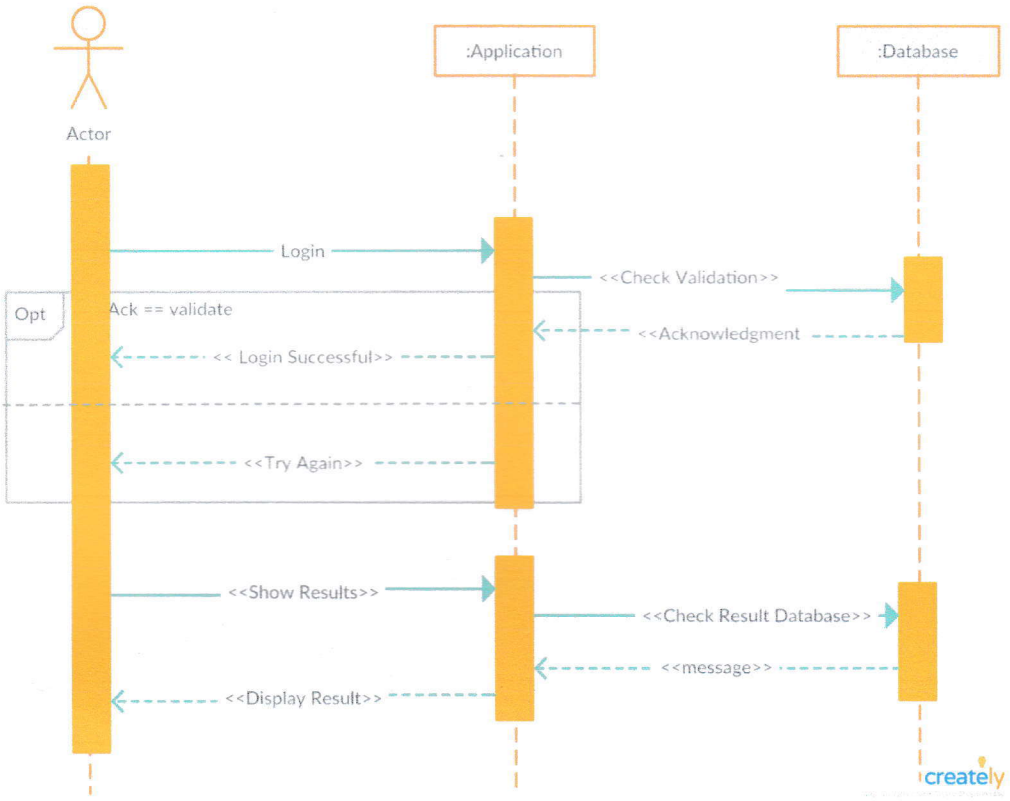

Figure 4.1.13.3- Sequence Diagram of User(Result)

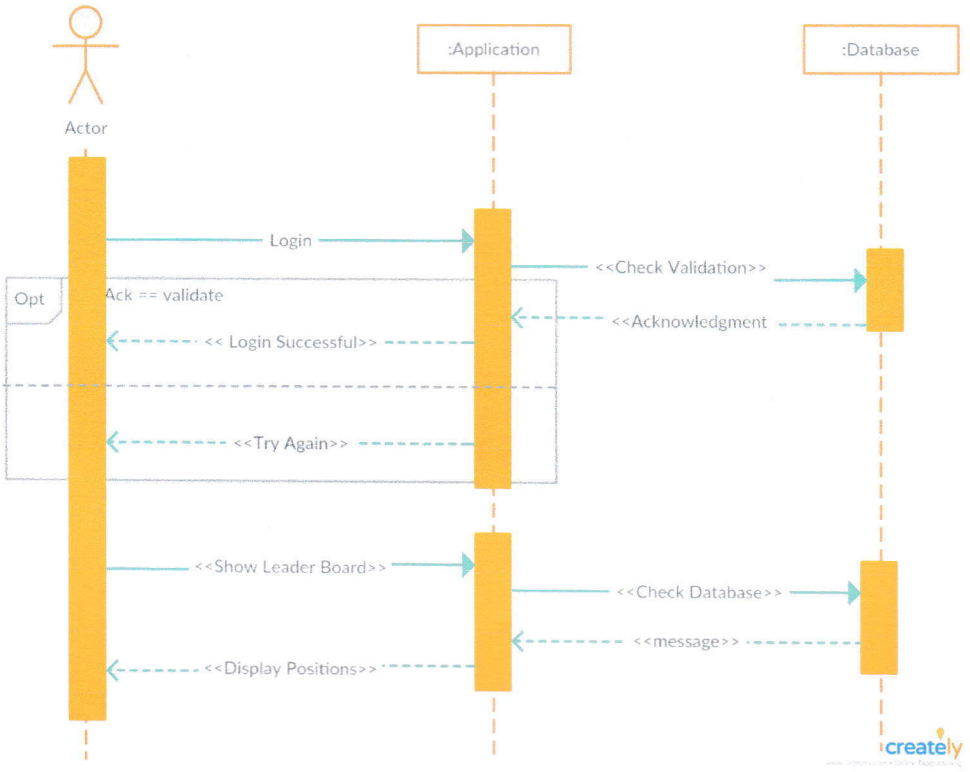

Figure 4.1.13.4- Sequence Diagram of User (Leader Board)

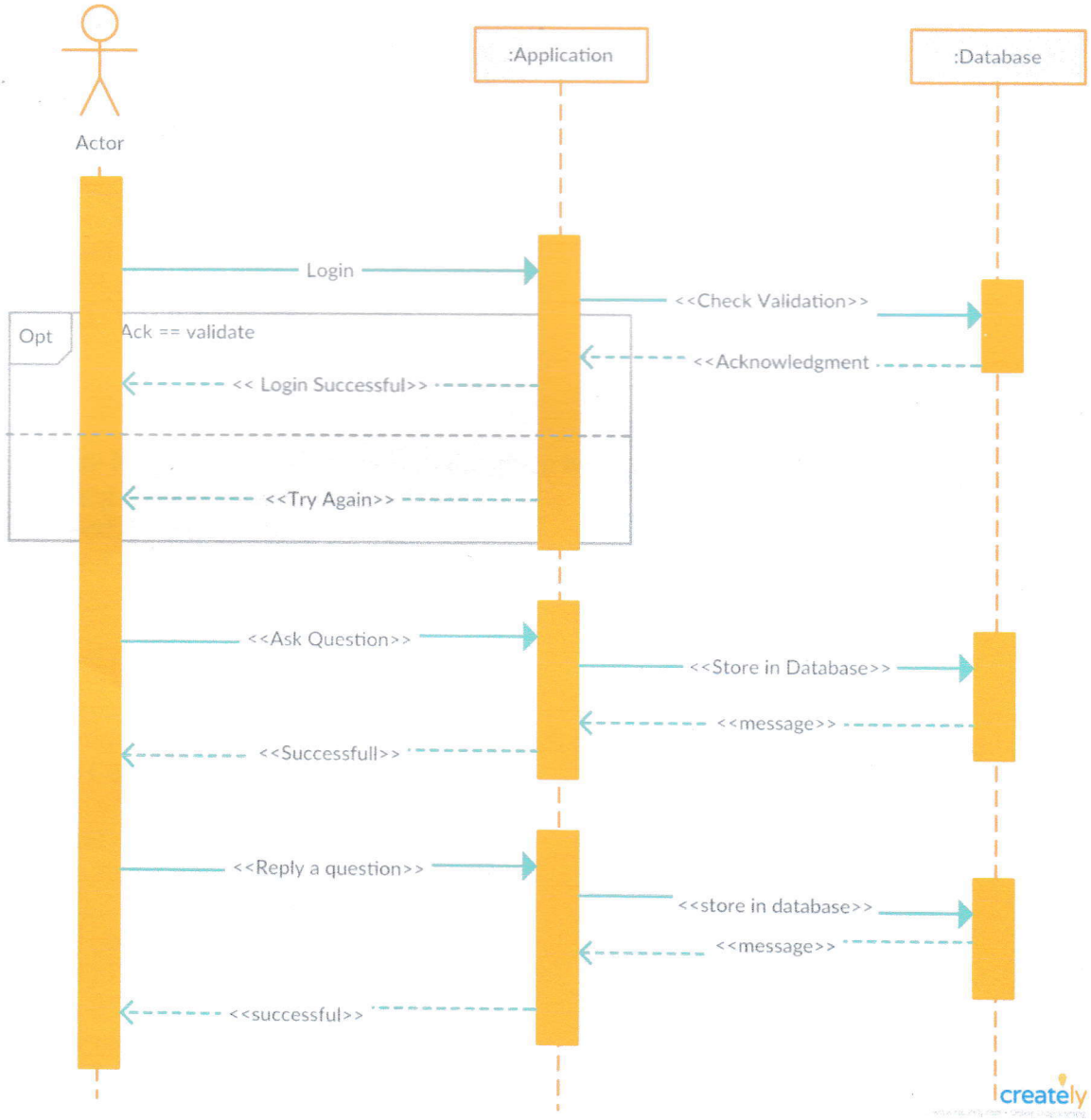

Figure 4.1.13.5- Sequence Diagram of User(Forum)

4.2 System Requirements and Cost

4.2.1 Hardware Requirements

Hardware Requirements of our project are given below:
Mother Board: Gigabyte 41 chipset
Processor: Intel Core i3, 3.0 GHz Clock speed
RAM: 4 GB or more
Hard Disk: 512 GB or more
Monitor: LED
Keyboard: 104 Keys
Mouse: 3 buttons
Network: Local Network

4.2.2 Software Requirements

Software Requirements of our project are given below:
Operating System: Windows 7 / windows 8.1
Front-end: HTML, CSS, Bootstrap
Back-end: MY SQL Server 2008 (For Network Use)
Language: PHP

4.2.3 Project Cost Estimation

Cost estimation describes the expense that needs to spend during project development.
Project Cost Estimation is given below:

Personal Cost:
Persons Required: Four
Post: Coder & UI/UX Design
Salary: 100.00/h
Working Duration: 8 Months
Weeks: 32
Total working hours = 32x3x4= 384 hours
Total salary = 100x384=38400.00
Total Salary of Four persons= 153600.00
Hardware Cost:

Cost of Computer	30000.00
Computer Life	2 year
Computer Usage	8 months
Computer Cost (Depreciation Cost)	(30000/24)x8 = 10000.00
4 Person Computer Cost	10000 x 4 = 40000.00

Total Hardware Cost = 40000.00(BDT)

Software Cost:

Description	Cost	Depreciation Expense	Depreciation Cost
Microsoft Windows 10	12000.00	(12000/12)x8	8000.00
Microsoft Office 2013	10000.00	(10000/12)x8	6666.00
Atom Text Editor	Free	N/A	N/A

Total Software Cost for 4 Person = (8000+6666) x 4 = 58664.00(BDT)

Total Project Cost = Personal Cost + Hardware Cost + Software Cost
= 153600.00+40000.00+58664.00
= 252264.00(BDT)

Chapter 05: Risk Management

5.1 Risk Management

Most software engineering projects are risky because of the range of serious potential problems that can arise. The primary benefit of risk management is to contain and mitigate threats to project success. We have to identify and plan, and then be ready to act when a risk arises—drawing upon the experience and knowledge of the entire team to minimize the impact to the project.

Software Risk management includes the identification and classification of technical, programmatic and process risks, which become part of a plan that links each to a mitigation strategy.

To ensure that risks remain in the forefront of project management activities, it's best to keep the risk management plan as simple as possible. For both conventional and agile software project management methodologies, a risk register is a proven tool for organizing and referring to known projects risks. A comprehensive risk register would contain consist of the following attributes:

Description of risk — Summary description of the risk—easy to understand.

Recognition Date — Date on which stakeholders identify and acknowledge the risk.

Probability of occurrence — Estimate of probability that this risk will materialize (%).

Severity — The intensity of undesirable impact to the project—if the risk materializes.

Owner — This person monitors the risk and takes action if necessary.

Action — The contingent response if the risk materializes.

Status — current team view of the risk: potential, monitoring, occurring, or eliminated.

Loss Size — Given in hours or days, this is a measure of the negative impact to the project.

Risk Exposure — Given in hours or days, this is is a product of probability and loss size.

Priority (optional) — This is either an independent ranking, or the product of probability and severity. Typically, a higher-severity risk with high probability has higher relative priority.[16]

5.2 The Risk Management Plan

1. Risk Mitigation: Proactive planning for risk avoidance.

2. Risk Monitoring: Assessing whether predicted risks occur or not, ensuring preventive steps are being properly applied, collect information for future risk analysis, attempt to

determine which risks caused which problem.

3. Risk Management: Actions to be taken in the event that mitigation steps have failed and the risk has become a live problem.

Type of Impact: Catastrophic (1), Marginal (2), Tolerable (3), Critical (4).

Type of Probability: very low (<10%), low (10–25%), moderate (25–50%), high (50–75%), very high (>75%).

Risk: 01

Name	Insufficient QA Time
Probability	45%
Description	Insufficient QA time to validate on all browser.
Loss (Days)	6
Risk Exposure (Days)	2.7
Status	Resolved

Risk 02:

Name	Lack of verifiable sample data
Probability	35%
Description	Lack of verifiable sample data may affect the ability to validate end product.
Loss (Days)	18
Risk Exposure (Days)	6.3
Status	Resolved

Risk 03:

Name	Following end user testing
Probability	25%
Description	Following end user testing, more effort on the user guide may be necessary.
Loss (Days)	18
Risk Exposure (Days)	4.5
Status	Not Occur

Risk 04:

Name	Backup and restore
Probability	20%
Description	Backup and restore may require 3rd party solution.
Loss (Days)	12
Risk Exposure (Days)	2.4
Status	The risk has not been arisen yet

Chapter 06: System Implementation

6.1 System Implementation and Testing

System testing and implementation is the last step in software development. System testing is an essential step for the development of a reliable and error-free system. Once source code has been generated, software must be tested to uncover and correct as many errors as possible before delivery to your customer. Your goal is to design a series of test cases that have a high likelihood finding errors but how, there are different methods that provides a systematic guidance for designing tests that, exercise the internal logic of software components, and Exercise the input and output domains of the program to uncover errors in the program function, behavior, and performance. Software testing is a crucial element of software quality assurance and represents the ultimate review of specification, design, and code generation. The work product is a set of test cases designed to exercise both internal logic and external requirements is designed and documented, expected results are defined, and actual results are recorded. The primary objectives of testing software are to execute a program with the intent of finding an error; a good test case will find an as-yet-undercover error, and a successful that uncover an as-yet-undercover error.

6.1.1 Testing Strategies

- Specification Testing
- Black box Testing
- White box Testing
- Regression Testing
- Acceptance Testing
- Assertion Testing
- Unit Testing
- System Testing

Specification Testing: Even if the code testing is performed exclusively, it doesn't ensure against program failure. Code testing doesn't answer whether the code meets the agreed specifications document. It doesn't also determine whether all aspects of the design are implemented. Therefore, examining specifications stating what program should do and how it should behave under various conditions performs specification testing. Test cases are developed to test the range of values expected including both valid and invalid data. It helps in finding discrepancies between the system and its original objective. During this testing phase, all efforts were made to remove programming bugs and minor design faults.

Black Box Testing: Black-box testing is conducted at the software interface. In Black Box testing only the functionality was tested without any regard to the code written. If the functionality, which was expected from a component, is provided then black box testing is completed.

White Box Testing: White-box testing, sometimes called glass-box testing is a test case design method that uses the control structure of the procedural design to derive test cases. In White Box testing internal code written in every component was tested and it was checked that the code written is efficient in utilizing various resources of the system like memory or the utilizing of input output.

Regression Testing: In Regression testing the software was tested against the boundary conditions. Various input fields were tested against abnormal values and it was tested that the software does not behave abnormally at any time.

Acceptance Testing: In acceptance testing the software was checked for completeness that itis ready. Normally the quality assurance department performs the acceptance testing that the software is ready and can be exported.

Assertion Testing: In assertion testing the software is tested against the possible assertions. Assertions are used to check the program and various locations that whether the state of the program at a particular point is the same as expected or not.

Unit Testing: In unit testing we checked that all the individual components were working properly. Before integration of the entire components unit testing is essential because it gives a confidence that all the components individually are working fine and ready to be integrated with the other ones.

System Testing: When all the units were working properly and unit testing was performed then comes the time for system testing where we checked all the integrated components as a whole and looked for possible discrepancies, which could have arisen after the integration.

6.2 Implementation

This phase consists of bringing the new system into operation and turning it over the users. Briefly it involves following steps.

Training

- User Groups
- Administrators

Installation of Computer Equipment's

- Location
- Power Supply
- Space Requirement

Testing The New System

System testing of the developed system was performed in these three steps.

Unit Testing: In unit testing the different modules of software are tested independently errors. This helps in locating errors, in coding and logic that were contained within a particular module. For example testing of each tab canvas individually for validates entries.

Integrated Testing: After unit testing, combined testing of all modules was carried out. The purpose was to determine that all the modules are correctly interacting with each other.

System Testing: Final testing was done on the entire system to check that whether the desired specification and requirements are met or not. The main aim here was to determine the inconsistencies in the developed system. Hence the whole system was tested.[14]

6.3 Database Table Structure

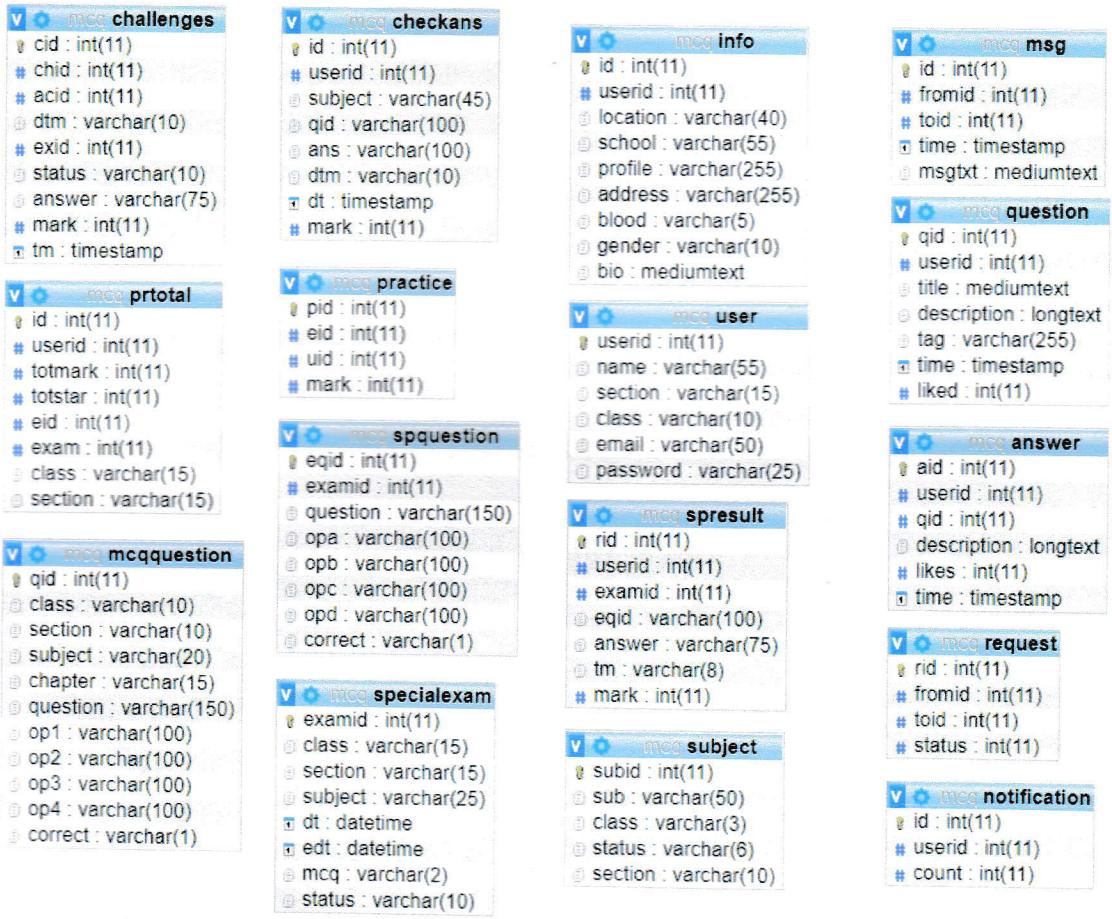

Figure 6.3.1: Database table structure

6.4 Screenshots

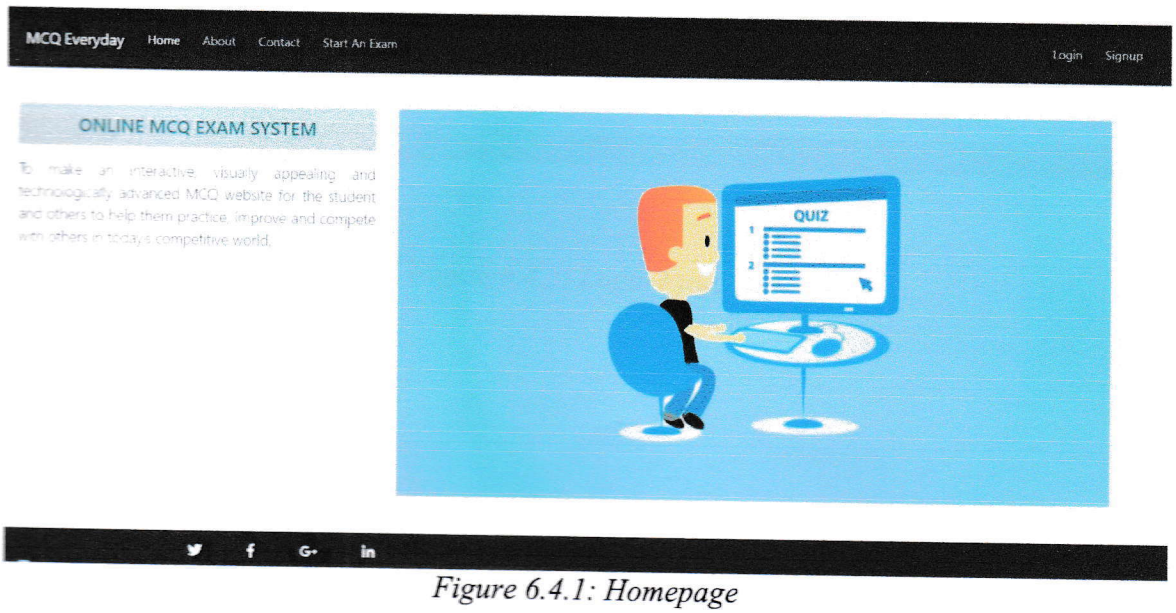

Figure 6.4.1: Homepage

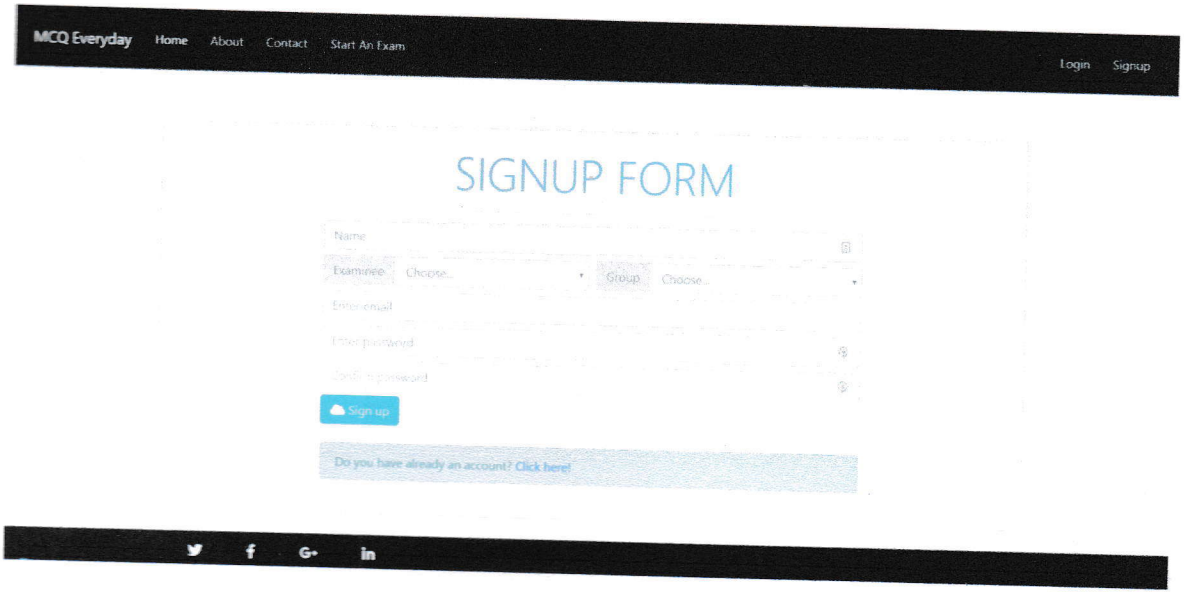

Figure 6.4.2: Signup page

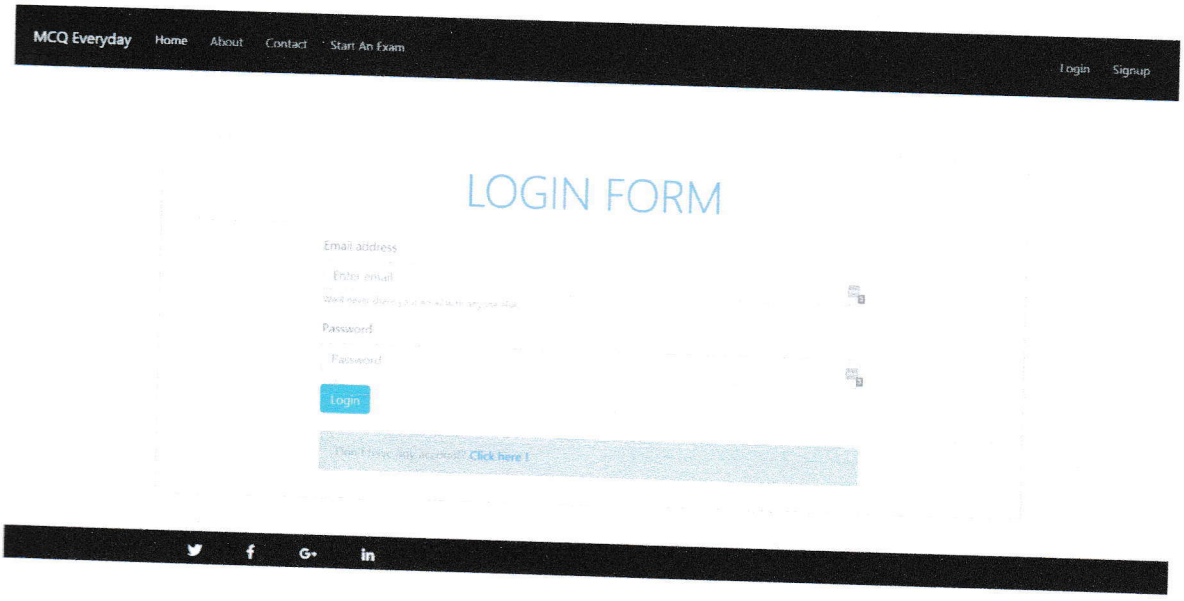

Figure 6.4.3: Login Page

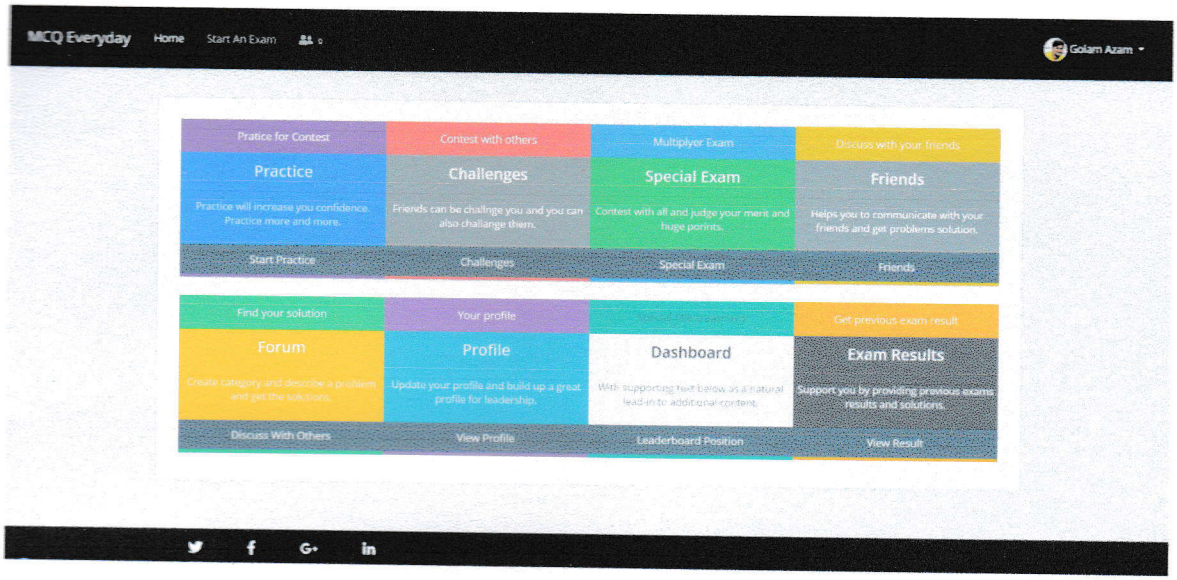

Figure 6.4.4: Dashboard

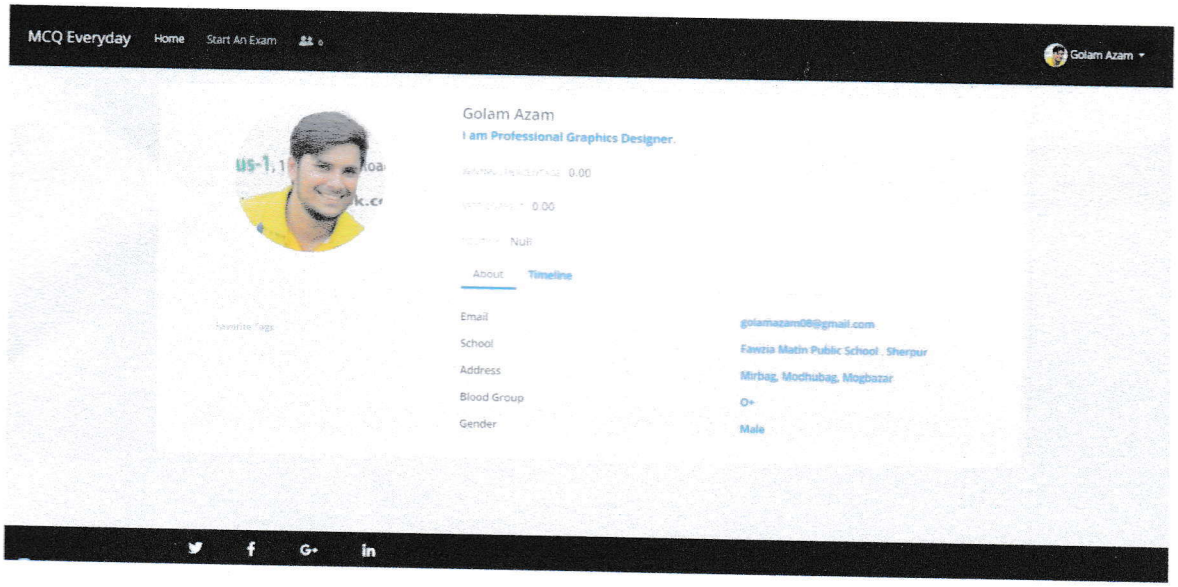

Figure 6.4.5: Profile

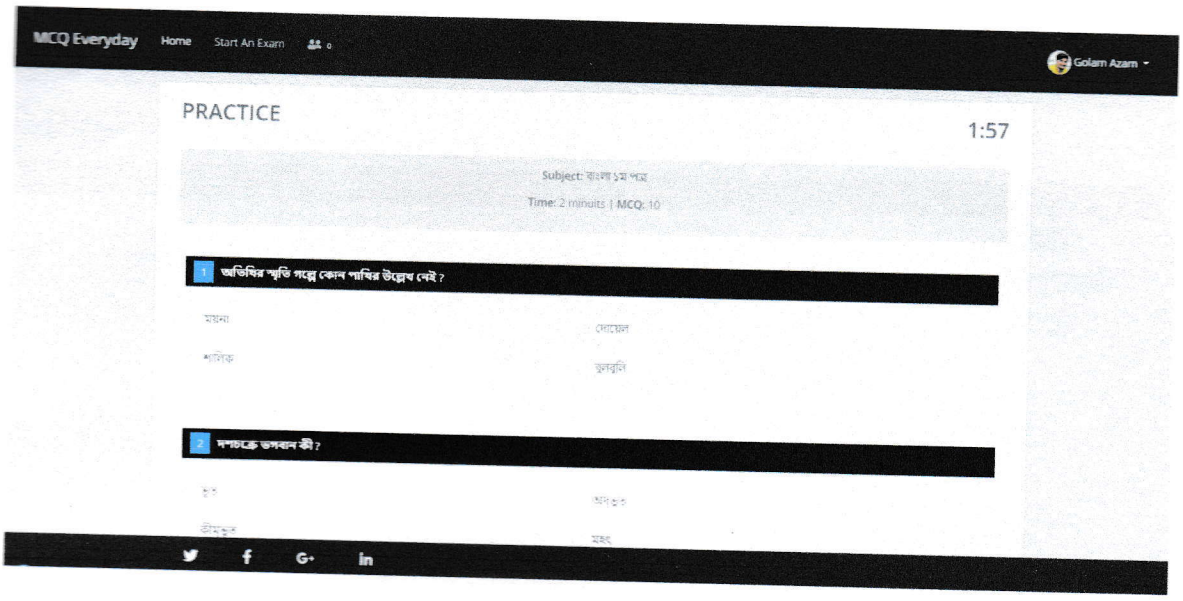

Figure 6.4.6: Practice page

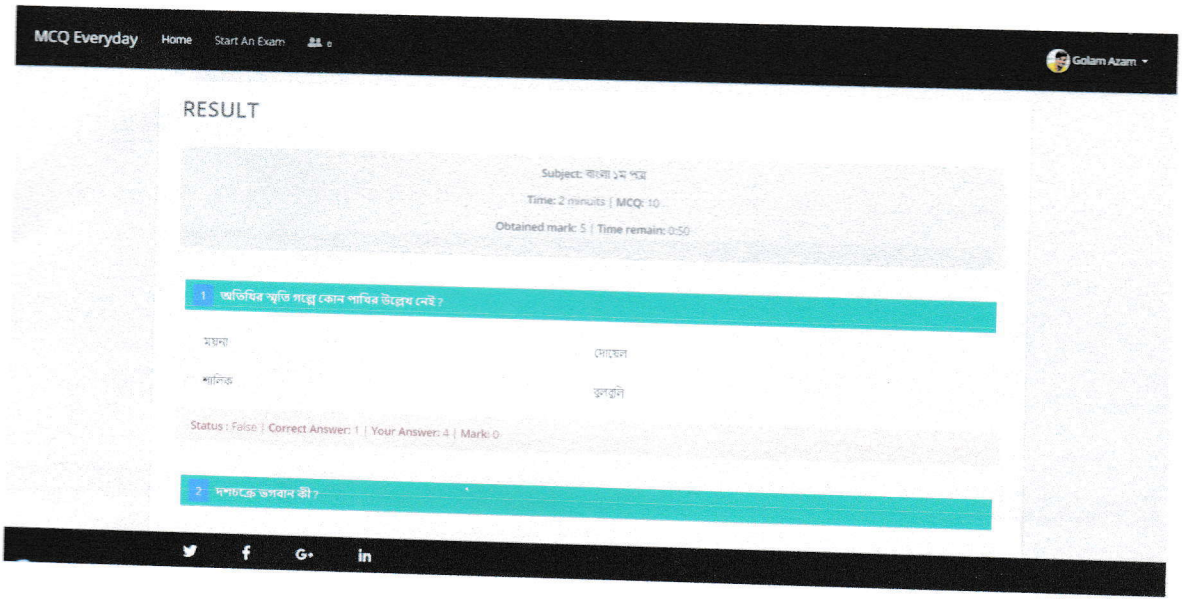

Figure 6.4.7: Result page

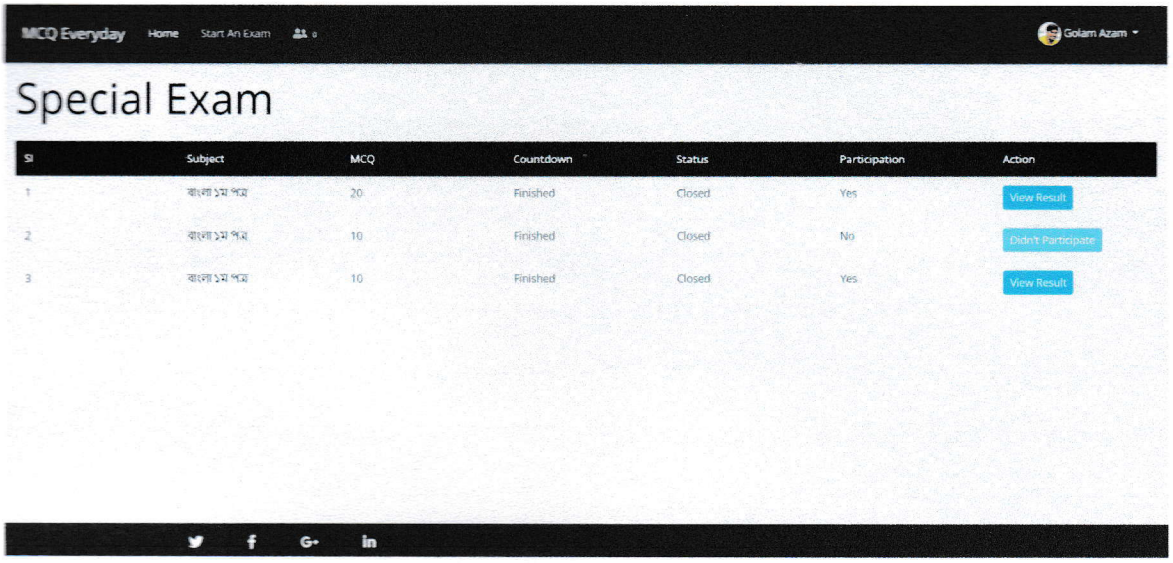

Figure 6.4.8: Special Exam Page

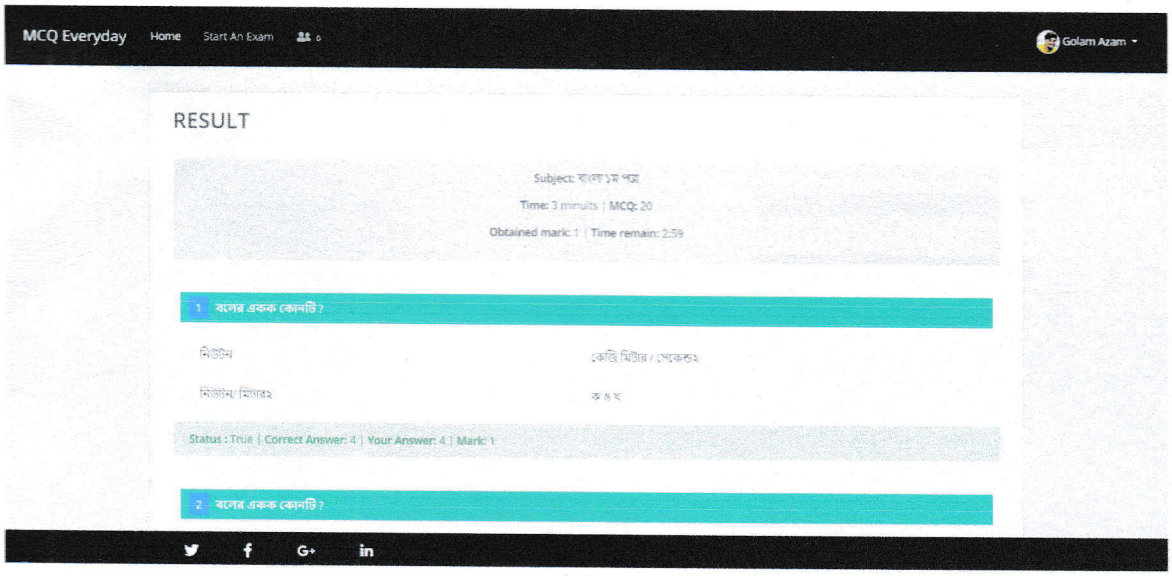

Figure 6.4.9: Special Exam Result Page

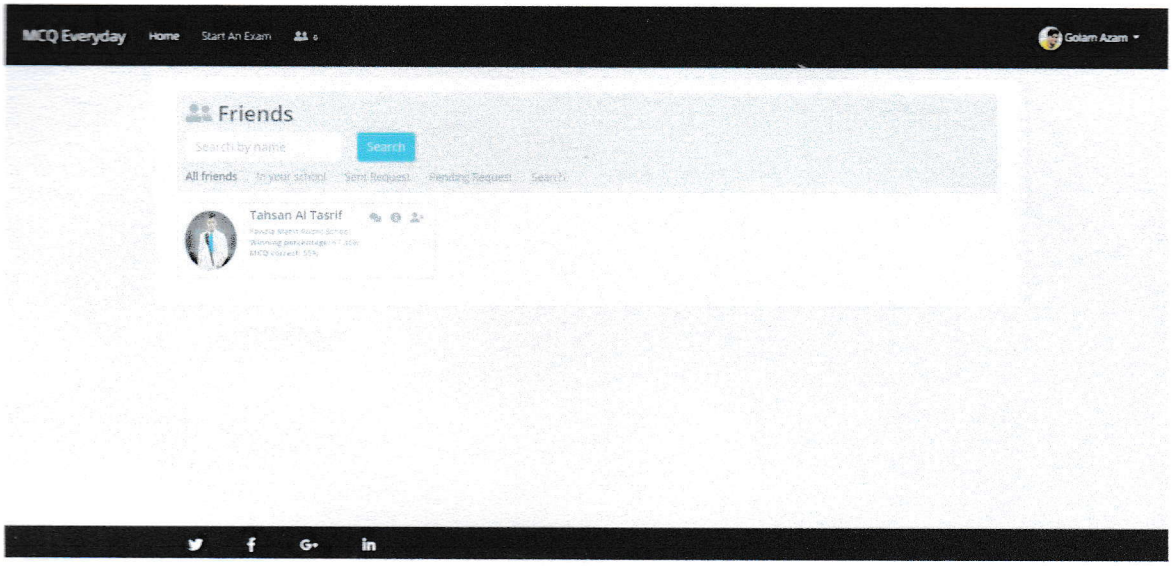

Figure 6.4.10: Friends

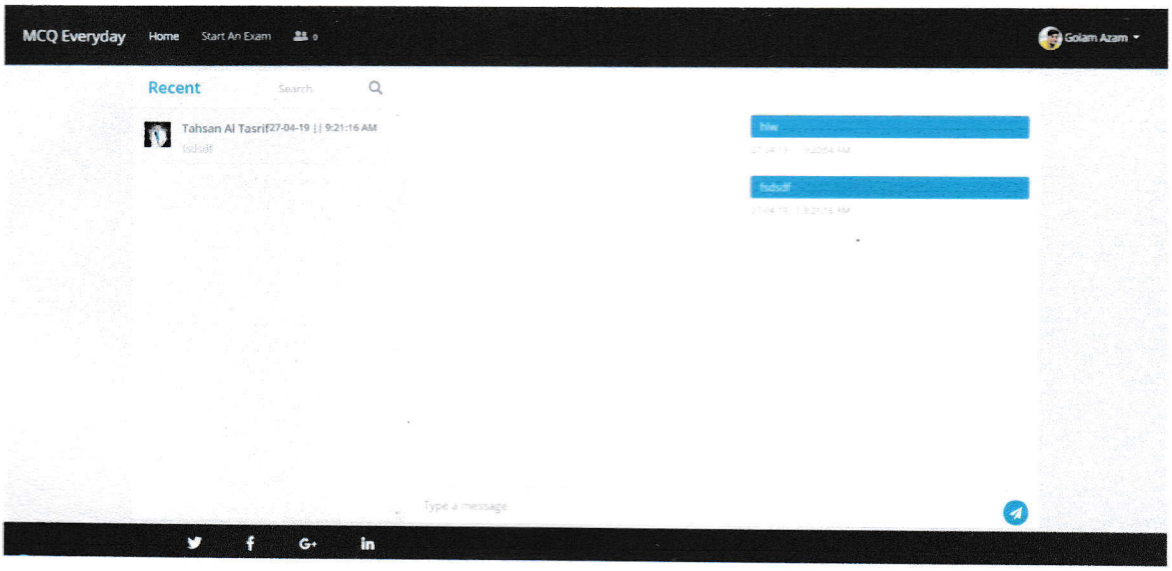

Figure 6.4.11: Chat system

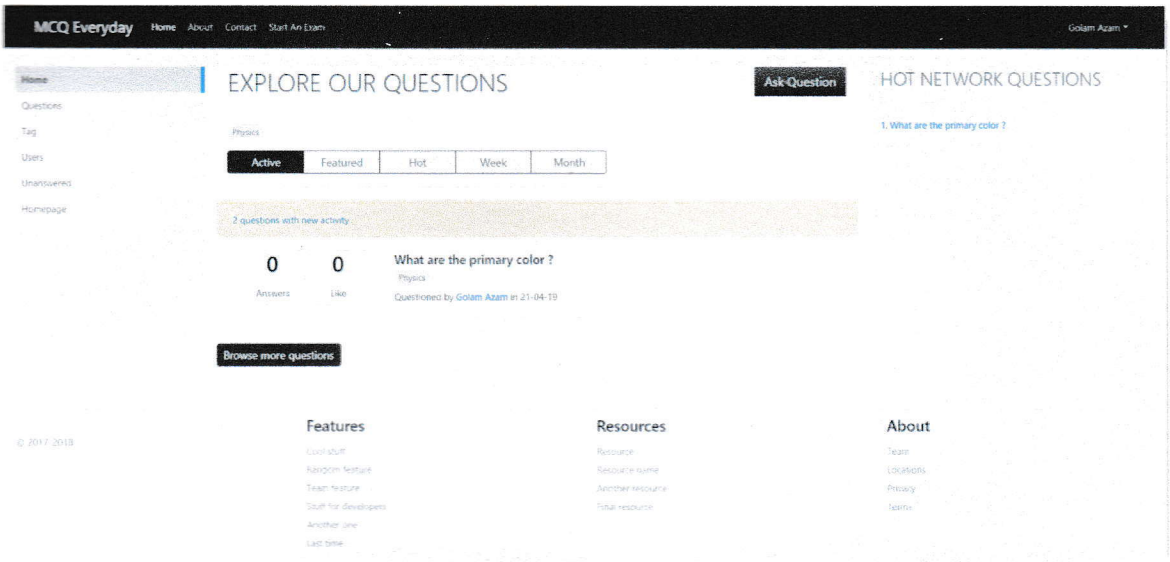

Figure 6.4.12: Forum

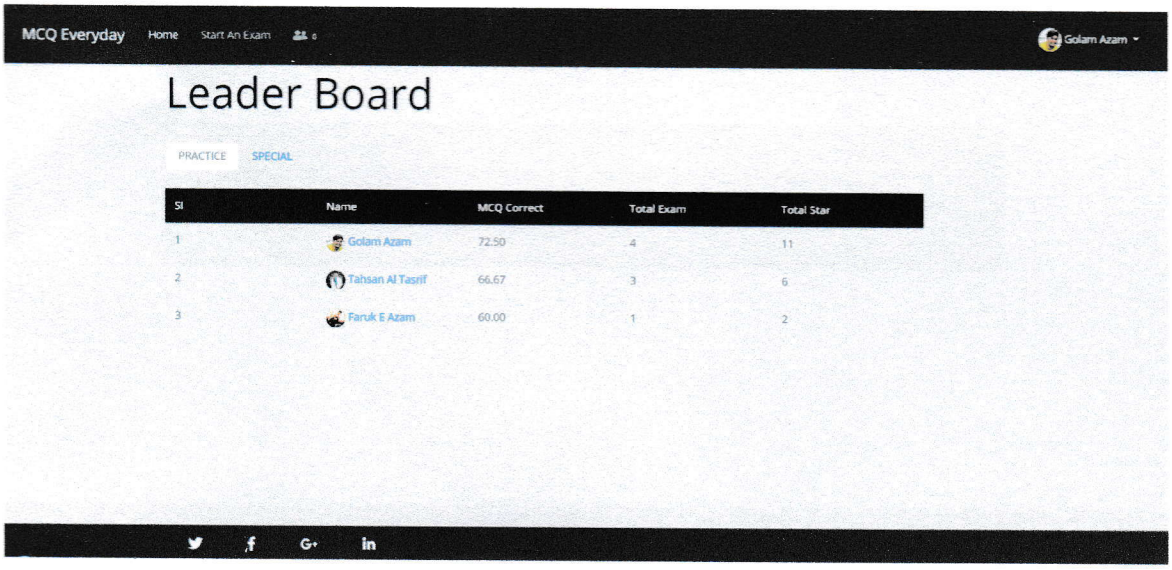

Figure 6.4.14: Leader Board

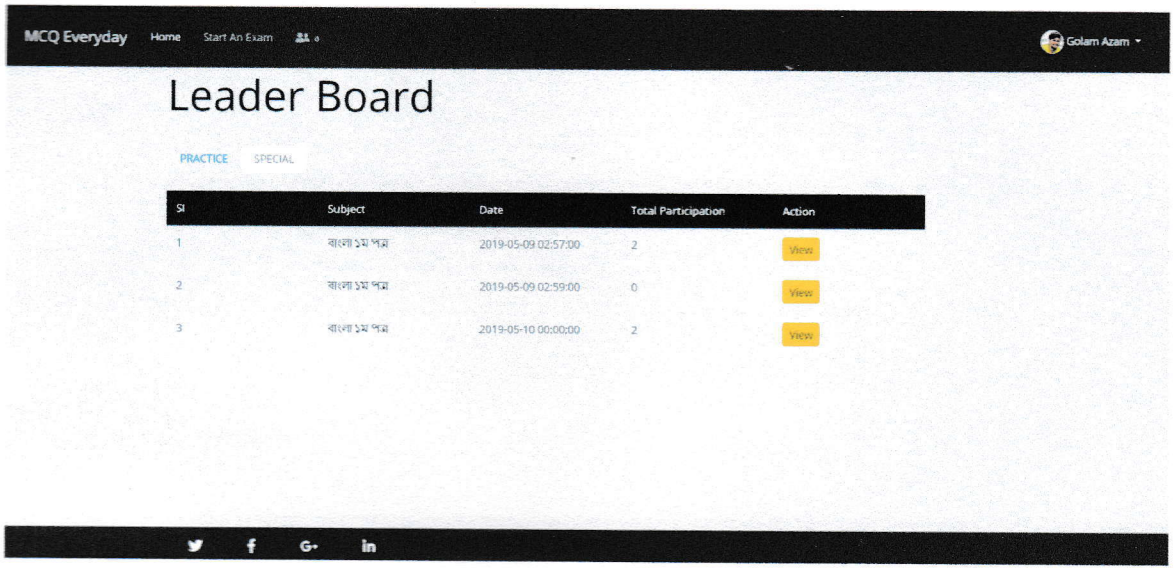

Figure 6.4.13: Leading position in practice part

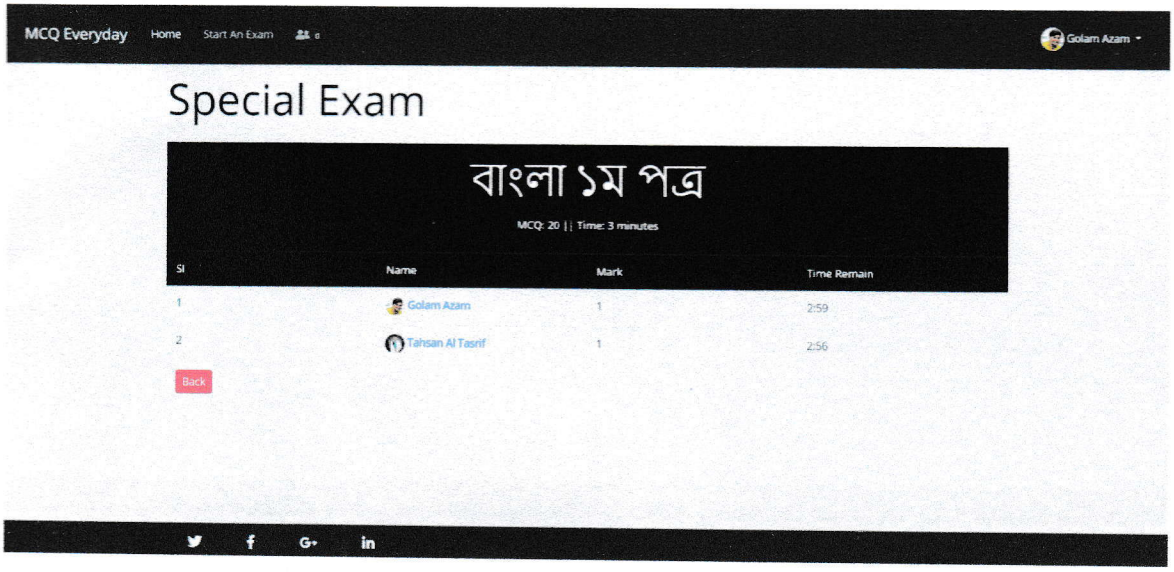

Figure 6.4.15: Special exam's leading positions

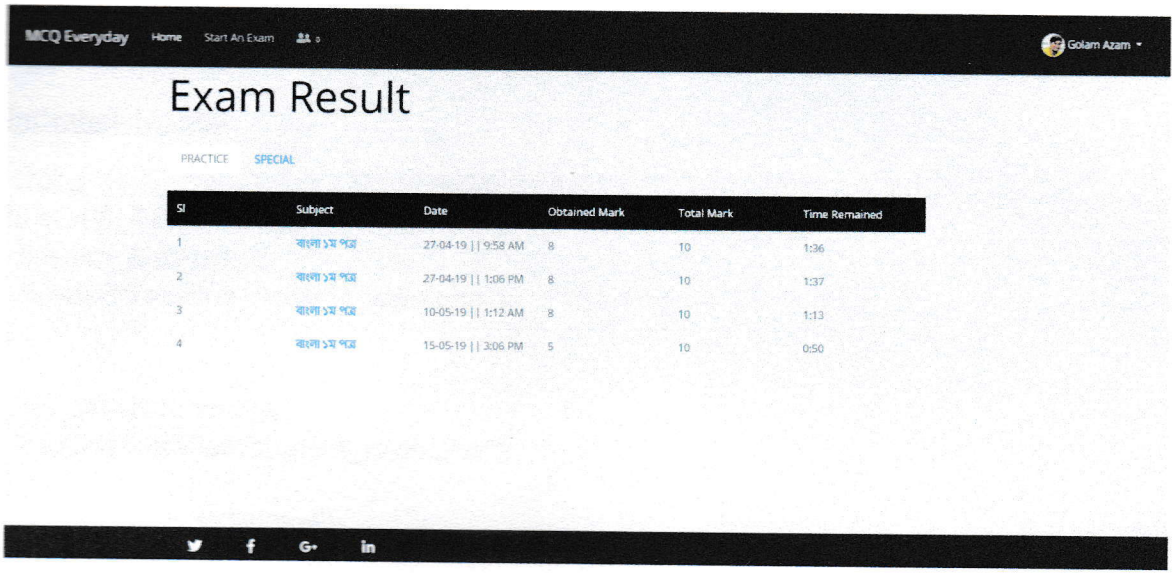

Figure 6.4.16: User's Practice Exams Result

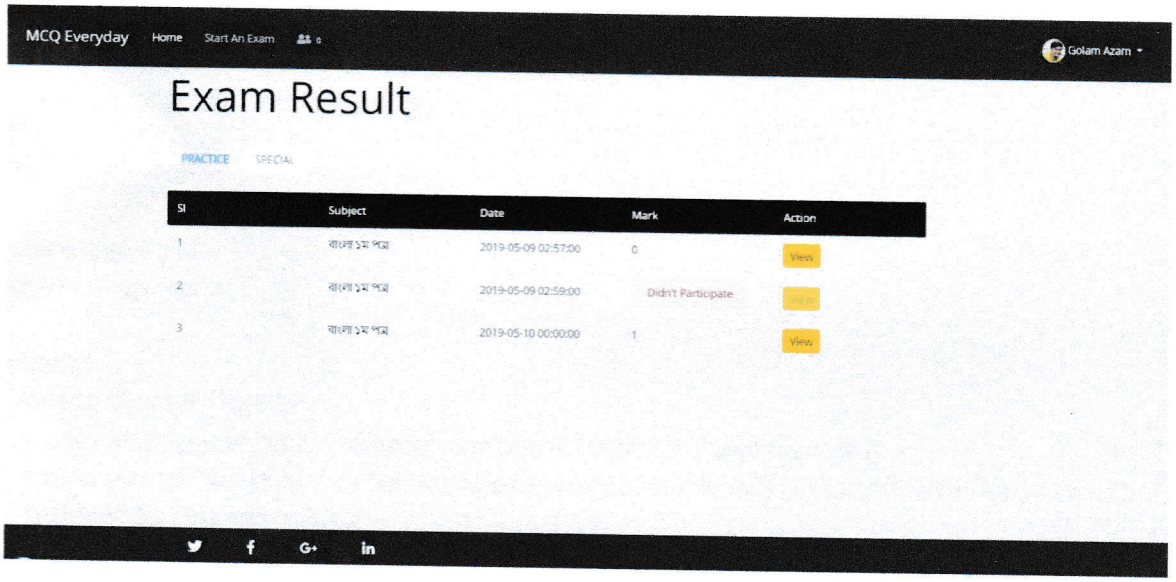

Figure 6.4.17: User's special Exams Result

6.5 Codes

indexheader.php

```
<?php
if(isset($_GET['mail'])){
 session_destroy();
 header("Location: student_login.php");
}

if(!$_SESSION['eml']){
 header("Location: student_login.php");
}
$email = $_SESSION['eml'];
$sql3 = "select * from user where email = '$email'";
$res3 = mysqli_query($conn,$sql3);
$row3 = mysqli_fetch_array($res3);
$id = $row3['userid'];

if (isset($_POST['notification'])) {
 $sql5 = "update notification set count = 0 where userid = $id";
 $res5 = mysqli_query($conn,$sql5);
 header('location: pending.php');
}
?>

<!doctype html>
<html lang="en">

<head>
 <meta charset="utf-8">
 <meta http-equiv="content-type" content="text/html; charset=utf-8">
 <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
 <title>MCQ Everyday</title>
 <script src="https://ajax.aspnetcdn.com/ajax/jQuery/jquery-3.3.1.min.js"></script>
 <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js" integrity="sha384-
q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi6jizo"
crossorigin="anonymous"></script>
 <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.6/umd/popper.min.js"
integrity="sha384-
wHAiFfRlMFy6i5SRaxvfOCifBUQy1xHdJ/yoi7FRNXMRBu5WHdZYu1hA6ZOblgut"
crossorigin="anonymous"></script>
 <script src="https://stackpath.bootstrapcdn.com/bootstrap/4.2.1/js/bootstrap.min.js"
integrity="sha384-
B0UglyR+jN6CkvvICOB2joaf5I4l3gm9GU6Hc1og6Ls7i6U/mkkaduKaBhlAXv9k"
crossorigin="anonymous"></script>
```

```
 <link rel="stylesheet" href="https://use.fontawesome.com/releases/v5.7.1/css/all.css"
integrity="sha384-
fnmOCqbTlWIlj8LyTjo7mOUStjsKC4pOpQbqyi7RrhN7udi9RwhKkMHpvLbHG9Sr"
crossorigin="anonymous">
 <link href="../css/app.css" rel="stylesheet">
 <link rel="stylesheet" href="css/student.css">
 <link rel="stylesheet" href="css/chat.css">
 <link rel="stylesheet" href="css/custom.css">
 <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js" integrity="sha384-
q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi6jizo"
crossorigin="anonymous"></script>
 <script src="js/jquery.countdown.js"></script>
 <script src="https://ajax.googleapis.com/ajax/libs/jquery/2.1.1/jquery.min.js"></script>
 <script
src="https://cdnjs.cloudflare.com/ajax/libs/jquery.countdown/2.2.0/jquery.countdown.min
.js"></script>
 <!-- <script src="js/countdown.js"></script> -->
 <style media="screen">
  .logout{
   padding: 0 !important;
   color: black !important;
   padding-left: 25px !important;
   padding-top: 5px !important;
   padding-bottom: 8px !important;
  }
  .logout:hover{
   color: #fff !important;
  }
 </style>
</head>

<body>
 <nav class="navbar navbar-expand-md navbar-dark bg-dark fixed-top">
  <a class="navbar-brand ml-4" href="index.php">MCQ Everyday</a>
  <button class="navbar-toggler" type="button" data-toggle="collapse" data-
target="#navbarsExampleDefault" aria-controls="navbarsExampleDefault" aria-
expanded="false" aria-label="Toggle navigation">
   <span class="navbar-toggler-icon"></span>
  </button>
  <div class="collapse navbar-collapse" id="navbarsExampleDefault">
   <ul class="navbar-nav mr-auto">
    <li class="nav-item active">
     <a style="padding: 28px 15px;" a class="nav-link" href="index.php">Home <span
class="sr-only">(current)</span></a>
    </li>
    <li class="nav-item">
     <a style="padding: 28px 15px;"  class="nav-link" href="#">Start An Exam</a>
```

```
      </li>
      <li class="nav-item">
       <?php
        $sql4 = "select * from notification where userid = $id";
        $res4 = mysqli_query($conn,$sql4);
        $row4 = mysqli_fetch_array($res4);
       ?>
       <form class="" action="" method="post">
        <button href="" type="submit" name="notification" style="padding: 28px 15px;
background: transparent; border: 0; cursor: pointer;"  class="nav-link">
         <i class="fas fa-user-friends"></i>
         <?php
          if($row4['count']>0){
           ?>
            <span class="badge badge-danger"> <?php echo $row4['count']; ?></span>
           <?php
          }
          else{
           ?>
           <span class="badge badge-default"> 0</span>
           <?php
          }
         ?>

         <span class="sr-only">unread messages</span>
        </button>
       </form>

      </li>
     </ul>
     <div class="btn-group mr-4">
      <a type="" class="dropdown-toggle" data-toggle="dropdown" data-display="static"
aria-haspopup="true" aria-expanded="false" href="">
       <?php
        $email = $_SESSION['eml'];
        $sql="select name,profile from((select userid,name from user where
email='$email')I,(select userid,profile from info)P) where I.userid = P.userid";
        // echo $sql;
        // die;
        $res = mysqli_query($conn,$sql);
        $row = mysqli_fetch_array($res);

        $sql2 = "select * from user where email = '$email'";
        $res2 = mysqli_query($conn,$sql2);
        $row2 = mysqli_fetch_array($res2);
        if($row['profile']==''){ ?>
```

```
        <img src="../images/1.png" width="30" alt="" class="rounded-circle">

       <?php }
       else{ ?>

        <img src="../images/<?php echo $row['profile'];?>" width="30" alt=""
class="rounded-circle">

       <?php }
      ?>
       <span><?php echo $row2['name']; ?></span>
     </a>
     <div class="dropdown-menu dropdown-menu-left dropdown-menu-lg-left">
      <a class="logout" href="my_profile.php">Profile</a>
      <a class="logout" href="update.php">Edit Profile</a>
      <a class="logout" href="index.php?mail="<?php echo $_SESSION['eml'] ?>>Log
out</a>
     </div>
    </div>
   </div>
  </nav>
```

practice.php

```
<?php
require 'connection.php';
session_start();
include 'lib/indexheader.php';
$email = $_SESSION['eml'];

$sql1 = "select * from user where email='$email'";
// echo "<br><br><br><br><br><br><br><br><br>".$sql1; die;

$res1 = mysqli_query($conn,$sql1);
$row1 = mysqli_fetch_array($res1);
$id = $row1['userid'];
$class = $row1['class'];
$section = $row1['section'];

$subject = $_GET['pracSub'];

?>
 <!-- main container -->

 <div class="showcase mb-4 pb-4" style="height: 100vh; margin-bottom: 15px;">
  <br><br>
```

```
<div class="container box" style="height: auto;">
 <h3><b class="text-center">PRACTICE</b><span id="time" class="float-right"></span></h3>
 <hr>
 <div class="alert alert-dark">
  <p class="text-center"><b>Subject: </b><span id="subject"><?php echo $subject; ?></span></p>
  <p class="text-center"><b>Time: </b>2 minuits | <b>MCQ: </b>10</p>
 </div>

 <hr>
  <form class="question-part" action="answer.php" method="post">
   <input type="hidden" name="uid" id="uid" value="<?php echo $id; ?>">
   <?php
   $qry = "select count(qid) as c from mcqquestion";
   $rs = mysqli_query($conn,$qry);
   $rw = mysqli_fetch_array($rs);
   $c = $rw['c'];
   // echo $c;
   $ran_arr = range(3, $c);
   shuffle($ran_arr);
   $ran_arr = array_slice($ran_arr ,3,$c);
   // print_r($ran_arr);
   $i=1;
   for($j=0;$j<$c;$j++){
    $sql = "select * from mcqquestion where qid = $ran_arr[$j] and class='$class' and subject='$subject' and section = '$section'";
    // echo $sql;
    $res = mysqli_query($conn,$sql);
    $row = mysqli_fetch_array($res);
    if($row == 0){
     continue;
    }else{
     ?>
     <fieldset id="<?php echo $row['qid'] ?>">
      <div class="question">
       <p><b><span class="si"><?php echo $i++; ?></span> <?php echo $row['question'] ?></b></p>
       <input type="hidden" id="qid" class="qid" value="<?php echo $row['qid']; ?>">
       <div class="col-md-12 row pl-4">
        <div class="custom-control col-md-6 custom-radio p-3">
         <input type="radio" value="1" class="custom-control-input chk" id="<?php echo $row['op1'] ?>" name="answer['<?php echo $row['qid'] ?>']">
         <label class="custom-control-label" for="<?php echo $row['op1'] ?>"><?php echo $row['op1'] ?></label>
        </div>
```

```
            <div class="custom-control col-md-6 custom-radio p-3">
             <input type="radio" value="2" class="custom-control-input chk" id="<?php
echo $row['op2'] ?>" name="answer['<?php echo $row['qid'] ?>']">
             <label class="custom-control-label" for="<?php echo $row['op2'] ?>"><?php
echo $row['op2'] ?></label>
            </div>
            <div class="custom-control col-md-6 custom-radio p-3">
             <input type="radio" value="3" class="custom-control-input chk" id="<?php
echo $row['op3'] ?>" name="answer['<?php echo $row['qid'] ?>']">
             <label class="custom-control-label" for="<?php echo $row['op3'] ?>"><?php
echo $row['op3'] ?></label>
            </div>
            <div class="custom-control col-md-6 custom-radio p-3">
             <input type="radio" value="4" class="custom-control-input chk" id="<?php
echo $row['op4'] ?>" name="answer['<?php echo $row['qid'] ?>']">
             <label class="custom-control-label" for="<?php echo $row['op4'] ?>"><?php
echo $row['op4'] ?></label>
            </div>
            <input type="radio" value="5" class="chk invisible" id="not_attempt"
name="answer['<?php echo $row['qid'] ?>']" checked>

           </div>
          </div>
         </fieldset>
         <hr>
         <?php
        }
        if($i==11){
         break;
        }
       }
      ?>
      <button class="btn btn-info" id="ansData" name="finish" type="submit"
name="button">Finish <span><i class="far fa-arrow-alt-circle-right"></i></span></button>
    </form>
   </div>
   <br><br><br>
  </div>
  <!-- container -->

  <script type="text/javascript">
   function startTimer(duration, display) {
    var timer = duration, minutes, seconds;
    setInterval(function () {
      minutes = parseInt(timer / 60, 10)
      seconds = parseInt(timer % 60, 10);
```

```
        // minutes = minutes < 10 ? "0" + minutes : minutes;
        // seconds = seconds < 10 ? "0" + seconds : seconds;

        display.textContent = minutes + ":" + seconds;

        if (timer == 0) {
            $("#ansData").click();
        }
        timer=timer-1;
    }, 1000);
}

window.onload = function () {
    var fiveMinutes = 60 * 2,
    display = document.querySelector('#time');
    startTimer(fiveMinutes, display);
};

var box = document.querySelector(".box");

// $("a").click(function(){
//   if (confirm("Directing back to the previous page, changes made will not be saved.")) {
//     document.querySelector('[name="finish"]').click();
//   } else {
//     return false;
//   }
// });

window.onbeforeunload = function(){
    if (confirm("This will be submitted . Are you sure?")) {
        $("#ansData").click();
    } else {
        return false;
    }
}

</script>

<?php include 'lib/footer.php' ?>
```

specialExam.php

```
<?php
```

```
 require 'connection.php';
 session_start();
 include 'lib/indexheader.php';
 $email = $_SESSION['eml'];

 $sql1 = "select * from user where email='$email'";
 // echo "<br><br><br><br><br><br><br><br><br>".$sql1; die;

 $res1 = mysqli_query($conn,$sql1);
 $row1 = mysqli_fetch_array($res1);
 $id = $row1['userid'];
 $class = $row1['class'];
 $section = $row1['section'];

?>


<section class="container-fluid pt-4">
 <br>
 <h1 class="display-4 pt-4 mt-4">Special Exam</h1>
 <table class="table mt-4" style="height: auto !important; width: 100%;">
  <thead class="thead-dark">
   <tr>
    <th>SI</th>
    <th>Subject</th>
    <th>MCQ</th>
    <th>Countdown</th>
    <th>Status</th>
    <th>Participation</th>
    <th>Action</th>
   </tr>
  </thead>
  <tbody>
   <?php
    $sql1 = "select * from specialexam where class = '$class' and section = '$section' and
status != 'completed' order by examid desc";
    // echo $sql1;
    $res1 = mysqli_query($conn,$sql1);
    $i=1;
    while($row1 = mysqli_fetch_array($res1)){
     ?>
     <tr>
      <td><?php echo $i++; ?></td>
      <td><?php echo $row1['subject']; ?></td>
      <td><?php echo $row1['mcq']; ?></td>
```

```
<?php
 date_default_timezone_set('Asia/Dhaka');
 $status = "Wainting ...";
 $timestamp = time();
 $tm = $row1['dt'];
 $etm = $row1['edt'];
 // echo date('Y-m-d H:i:s', $timestamp);
 // echo "<br>";
 // echo $tm;
 $tm = strtotime($tm);
 $etm = strtotime($etm);
 // echo $timestamp;
 // echo "<br>";
 // echo $tm;
 if($timestamp >= $tm && $timestamp < $etm){
  ?>
   <td data-countdown="<?php echo $row1['edt']; ?>"></td>
  <?php
 }elseif($timestamp >= $etm){
  ?>
   <td>Finished</td>
  <?php
 }else{
  ?>
   <td data-countdown="<?php echo $row1['dt']; ?>"></td>
  <?php
 }
?>

<td>
 <?php
  date_default_timezone_set('Asia/Dhaka');
  $status = "Waiting ...";
  $timestamp = time();
  $tm = $row1['dt'];
  $etm = $row1['edt'];
  $tm = strtotime($tm);
  $etm = strtotime($etm);
  if($timestamp >= $tm && $timestamp < $etm){
   $status = "Running ...";
   echo $status;
  }elseif($timestamp >= $etm){
   $status = "Closed";
   echo $status;
  }else{
   $status = "Waiting ...";
```

```
            echo $status;
          }
         ?>
        </td>
        <td>
         <?php
         $examid = $row1['examid'];
         $q = "select * from spresult where userid = $id and examid = $examid";
         // echo $q;
         $r = mysqli_query($conn,$q);
         $rw = mysqli_fetch_array($r);
         if($rw){
          echo "Yes";
         }else{
          echo "No";
         }
         ?>
        </td>
        <td>
         <?php
          date_default_timezone_set('Asia/Dhaka');
          $cls = "disabled";
          $val = "Wait";
          $timestamp = time();
          $tm = $row1['dt'];
          $etm = $row1['edt'];
          $tm = strtotime($tm);
          $etm = strtotime($etm);
          $examid = $row1['examid'];
          $q = "select * from spresult where userid = $id and examid = $examid";
          // echo $q;
          $r = mysqli_query($conn,$q);
          $rw = mysqli_fetch_array($r);
          if($timestamp >= $tm && $timestamp < $etm && !$rw){
           ?>
            <a href="spexam.php?examid=<?php echo $row1['examid']; ?>" class="btn btn-
sm btn-info mr-auto">Start</a>
           <?php
          }elseif($timestamp >= $etm && $rw){
           ?>
            <a href="spanswer.php?examid=<?php echo $row1['examid']; ?>" class="btn btn-
sm btn-info mr-auto">View Result</a>
           <?php
          }elseif($rw){
           ?>
```

```
                <a href="spanswer.php?examid=<?php echo $row1['examid']; ?>" class="btn btn-
sm btn-info mr-auto">View Result</a>
                <?php
               }elseif(!$rw){
                ?>
                 <a href="#" class="btn btn-sm btn-info mr-auto disabled">Didn't Participate</a>
                <?php
               }else{
                ?>
                 <a href="#" class="btn btn-sm btn-info mr-auto disabled">Wait</a>
                <?php
               }
              ?>

            </td>
          </tr>
          <?php
        }
      ?>

    </tbody>
  </table>
  <div id="clock"></div>
</section>

<script type="text/javascript">

$('[data-countdown]').each(function() {
  var $this = $(this),
  finalDate = $(this).data('countdown');
  $this.countdown(finalDate, function(event) {
    $this.html(event.strftime('%D days %H:%M:%S'));
  });
});
$(this).on('finish.countdown', function(event){
  window.location = "http://localhost/mcq/student/specialExam.php";
});


// $('[data-countdown]').each(function() {
//   var $this = $(this),
//   finalDate = $(this).data('countdown');
//   $this.countdown(finalDate, function(event) {
//     $this.html(event.strftime('%D days %H:%M:%S'));
//   });
// });
```

```
// .on('finish.countdown', function(event) {
//   $(this).html('This offer has expired!')
//     $(".btn").removeClass('disabled');
// });



// var fiveSeconds = new Date().getTime() + 5000;
// $('#clock').countdown(fiveSeconds, {elapse: true})
// .on('update.countdown', function(event) {
//   var $this = $(this);
//   if (event.elapsed) {
//     $this.html(event.strftime('After end: <span>%H:%M:%S</span>'));
//   } else {
//     $this.html(event.strftime('To end: <span>%H:%M:%S</span>'));
//   }
// });



// $('#clock').countdown('2020/10/10 12:34:56')
// .on('update.countdown', function(event) {
//   var format = '%H:%M:%S';
//   if(event.offset.totalDays > 0) {
//     format = '%-d day%!d ' + format;
//   }
//   if(event.offset.weeks > 0) {
//     format = '%-w week%!w ' + format;
//   }
//   $(this).html(event.strftime(format));
// })
// .on('finish.countdown', function(event) {
//   $(this).html('This offer has expired!')
//     .parent().addClass('disabled');
//
// });
</script>


<?php include 'lib/footer.php' ?>
```

answer.php

```
<?php
require 'connection.php';
```

```
session_start();
include 'lib/indexheader.php';
$email = $_SESSION['eml'];

$sql1 = "select * from user where email='$email'";
// echo "<br><br><br><br><br><br><br><br><br>".$sql1; die;

$res1 = mysqli_query($conn,$sql1);
$row1 = mysqli_fetch_array($res1);
$id = $row1['userid'];
$class = $row1['class'];
$section = $row1['section'];

$sql2 = "SELECT * FROM `checkans` WHERE userid = $id ORDER BY id desc LIMIT 1";
$res2 = mysqli_query($conn,$sql2);
$row2 = mysqli_fetch_array($res2);
$qd = $row2['qid'];
$chs = $row2['ans'];
$subject = $row2['subject'];
$time = $row2['dtm'];
$eid = $row2['id'];

$qc = explode(",",$qd);
$chk = explode(",",$chs);

$correct = 0;
$wrong = 0;

for($i=0;$i<count($qc);$i++){
  $sql3="select * from mcqquestion where qid = $qc[$i]";
  $res3 = mysqli_query($conn,$sql3);
  $row3 = mysqli_fetch_array($res3);
  if($row3['correct'] == $chk[$i]){
    $correct=$correct+1;
  }
  else{
    $wrong = $wrong+1;
  }
}

$sql6 = "UPDATE checkans SET mark=$correct WHERE id = $eid";
$res6 = mysqli_query($conn,$sql6);
$sql7 = "select * from prtotal where userid = $id";
$res7 = mysqli_query($conn,$sql7);
if(mysqli_num_rows($res7)>0){
  $row7 = mysqli_fetch_array($res7);
```

```
  if($row7['eid'] != $eid){
    if($correct>7){
      $star = 3;
    }else if($correct>4){
      $star = 2;
    }else if($correct>0){
      $star = 1;
    }else{
      $star = 0;
    }
    $sql8 = "update prtotal set totmark = (totmark + $correct),totstar = (totstar + $star),eid = $eid,exam=(exam + 1) where userid = $id";
    $res8 = mysqli_query($conn,$sql8);
  }
}
else{
  if($correct>8){
    $star = 3;
  }else if($correct>5){
    $star = 2;
  }else if($correct>1){
    $star = 1;
  }else{
    $star = 0;
  }
  $sql8 = "INSERT INTO prtotal(userid,totmark,totstar,eid,exam,class,section) VALUES ($id,$correct,$star,$eid,1,'$class','$section')";
  $res8 = mysqli_query($conn,$sql8);
}

?>
  <!-- main container -->
  <div class="showcase pb-4 mb-4" style="height: auto;">
    <br><br>
    <div class="container" style="height: auto;">
      <h3><b class="text-center">RESULT</b></h3>
      <hr>
      <div class="alert alert-dark">
        <p class="text-center"><b>Subject: </b><?php echo $subject; ?></p>
        <p class="text-center"><b>Time: </b>2 minuits | <b>MCQ: </b>10</p>
        <p class="text-center"><b>Obtained mark: </b><?php echo $correct; ?> | <b>Time remain: </b><?php echo $time; ?></p>
      </div>

      <hr>
      <form class="answer-part" action="">
```

```
<?php
$sql4 = "SELECT * FROM checkans WHERE userid = $id ORDER BY id desc LIMIT
1";
$res4 = mysqli_query($conn,$sql4);
$row4 = mysqli_fetch_array($res4);
$qid = $row4['qid'];
$choose = $row4['ans'];
$q = explode(",",$qid);
$ch = explode(",",$choose);
// print_r ($q);
$correct = 0;
$wrong = 0;
for($i=0;$i<count($q);$i++){
 $sql5="select * from mcqquestion where qid = $q[$i]";
 // echo $sql5; die;
 $res5 = mysqli_query($conn,$sql5);
 $row5 = mysqli_fetch_array($res5);
 if($row5['correct'] == $ch[$i]){
  $status = "True";
  $mark = 1;
  $correct = $correct+1;
  $color = "success";
 }
 elseif($ch[$i]==5){
  $color = 'dark';
  $mark = 0;
  $status = "Not attampt";
  $wrong = $wrong +1;
 }
 else{
  $status = "False";
  $color="danger";
  $mark = 0;
  $wrong = $wrong+1;
 }

 ?>
 <div class="answer">
  <p><b><span class="si"><?php echo $i+1 ?></span> <?php echo $row5['question'];
?></b></p>
  <div class="col-md-12 row pl-4">
   <div class="custom-control col-md-6 custom-radio p-3">
    <label class="custom-control-label" for="defaultGroupExample1"><?php echo
$row5['op1']; ?></label>
   </div>
```

```
            <div class="custom-control col-md-6  custom-radio p-3">
              <label  class="custom-control-label"  for="defaultGroupExample2"><?php  echo
$row5['op2']; ?></label>
            </div>
          </div>
          <div class="col-md-12 row pl-4">
            <div class="custom-control col-md-6  custom-radio p-3">
              <label  class="custom-control-label"  for="defaultGroupExample3"><?php  echo
$row5['op3']; ?></label>
            </div>
            <div class="custom-control col-md-6  custom-radio p-3">
              <label  class="custom-control-label"  for="defaultGroupExample4"><?php  echo
$row5['op4']; ?></label>
            </div>
          </div>
        </div>
        <p class="alert alert-<?php echo $color; ?>"><b>Status : </b><?php echo $status; ?> |
<b>Correct Answer: </b><?php echo $row5['correct']; ?> | <b>Your Answer: </b><?php echo
$ch[$i]; ?> | <b>Mark: </b><?php echo $mark; ?></p>
        <hr>
        <?php
      }
    ?>
    <a  class="btn  btn-info"  href="index.php"  ><span><i  class="far  fa-arrow-alt-circle-
left"></i></span> Back to homepage</a>
  </form>
 </div>
</div>
<!-- container -->

<?php include 'lib/footer.php' ?>
```

Chapter 07: System Quality Management

7.1 Quality Management

Quality management is a management process that aims to develop and manage the quality of software in such a way so as the best ensure the product meets the quality standards expected by the customer while also meeting any necessary regulatory and developer requirements, if any. Software quality managers require software to be tested before it is released to the market, and they do this using a cyclical process-based quality assessment in order to reveal and fix bugs before release. Their job is not only to ensure the software is in good shape for the consumer but also to encourage a culture of quality throughout the enterprise.

7.1.1 Quality Management Activities

Software quality management activities are generally split up into three core components: quality assurance, quality planning, and quality control. Some like software engineer and author Ian Summerville don't use the term "quality control" (as quality control is often viewed as more a manufacturing term than a software development term), rather, linking its associated concepts with the concept of quality assurance. However, the three core components otherwise remain the same.

7.1.1.1 Quality Assurance

By setting up an organized and logical set of organizational processes and deciding on that software development standards — based on industry best practices — that should be paired with those organizational processes, software developers stand a better chance of producing higher quality software. However, linking quality attributes such as "maintainability" and "reliability" to processes is more difficult in software development due to its creative design elements versus the mechanical processes of manufacturing. Additionally, "process standardization can sometimes stifle creativity, which leads to poorer rather than better quality software."
This stage can include:

- encouraging documentation process standards, such as the creation of well-defined engineering documents using standard templates
- mentoring how to conduct standard processes, such as quality reviews
- performing in-process test data recording procedures
- identifying standards, if any, that should be used in software development processes

7.1.1.2 Quality Planning

Quality planning works at a more granular, project-based level, defining the quality attributes to be associated with the output of the project and how those attributes should be assessed. Additionally, any existing organizational standards may also be assigned to the project at this phase. Attributes such as "robustness," "accessibility," and "modularity" may be assigned to the software development project. While this may be a more formalized, integral process, those using a more agile method of quality management may place less emphasis on strict planning structures. The quality plan may also address intended market, critical release dates, quality goals, expected risks, and risk management policy.

7.1.1.3 Quality Control

The quality control team tests and reviews software at its various stages to ensure quality assurance processes and standards at both the organizational and project level are being followed. These checks are optimally separate from the development team so as to lend more

of an objective view of the product to be tested. However, project managers on the development side must also assist, helping to promote as part of this phase a "culture that provides support without blame when errors are discovered." In software development firms implementing a more agile quality approach, these activities may be less formal; however, a switch to agile methods from a more formal quality management structure may create problems if management procedures aren't appropriately adapted.

Activities include:

- release testing of software, including proper documentation of the testing process
- examination of software and associated documentation for non-conformance with standards
- follow-up review of software to ensure any required changes detailed in previous testing are addressed
- application of software measurement and metrics for assessment[15]

Chapter 08: Conclusion

8.1 The Experience

Working on this project was challenging and interesting for all of us. We learned a lot about many things about Software Development. We listed some of our learning from the project below:

The designing and development strategy of a web application.
Database management.
Hands-on experience in software development.
Various type of software development methods.

8.2 Future Work

Our software is a web application for practising and giving MCQ exam. Till now we can do a very little version of the big project. As our limited time of the project, we develop only the core features of the project but in future, it can be possible to add more features.

Our future work will be:

1. Real-Time Chatting System
2. Real-Time Forum Q/A
3. Versus MCQ Exam

8.3 Conclusion

The Online based MCQ system is a complete project for users to test their knowledge and skills of a specific topic or subject. Our users can test their skills as well as compete with others and can see their rankings. This will help our users to compete in today's competitive world.

8.4 Acronyms

CSE – Computer Science and Engineering
MCQ – Multiple Choice Question
CSS – Cascading Style Sheets
CRUD – Create, Retrieve, Update and Delete
DFD – Data Flow Diagram
ER – Entity Relationship
ERD – Entity Relationship Diagram
ERM – Entity Relationship Model
HTML – HyperText Markup Language
ISP – Internet Service Provider
LED – Light Emitting Diode
PHP – Hypertext Preprocessor
QA – Quality Assurance
RAM –Random Access Memory
RMMM – Risk Mitigation, Monitoring & Management
SU – Sonargaon University
SQL – Structured Query Language
UI – User Interface
UX – User Experience
WWW – World Wide Web

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