CBE SCHEDULER

Final Year Project

Session 2014-20

A project submitted in partial fulfillment of the degree of

BS in Computer Science

Department of Computer Science

Faculty of Software Engineering & Information Technology

The Superior College, Lahore

SPRING 20

Type (Nature of project)	[✓] **D**evelopment [ ] **R**esearch [ ] **R**&**D**
Area of specialization	
FYP ID	FYP19-GROUP-048

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*The candidates confirm that the work submitted is their own and appropriate credit has been given where reference has been made to work of others

Plagiarism Free Certificate

This is to certify that, I Usama Mehmood Son of Asif Mahmood, group leader of FYP under registration no FYP19-GROUP-048 at computer science Department, The Superior College, Lahore. I declare that my FYP report is checked by my supervisor.

Date: Name of Group Leader: ____Usama Mahmood___ Signature: _____

Name of Supervisor: Mr. Zaman Aziz

Designation: Lecturer

Signature: _____

HoD: Dr. Arfan Jaffar

Signature: _____

Project Report

[Title of Project]

Change Record

Author(s)	Version	Date	Notes	Supervisor's Signature
Usama Mahmood	1.0		<Original Draft>	
Usama Mahmood	2.0		<Changes Based on Feedback from Supervisor>	
Usama Mahmood	3.0		<Changes Based on Feedback From Faculty>	
Usama Mahmood	4.0		<Added Project Plan>	

APPROVAL

PROJECT SUPERVISOR

Comments: _____

_____

Name:_____

Date:_____ Signature:_____

PROJECT MANAGER

Comments: _____

_____

Date:_____ Signature:_____

HEAD OF THE DEPARTMENT

Comments: _____

_____

Date:_____ Signature:_____

Dedication

My very first thanks should be to Allah for all that he has given me and the ability to write and finish this documentation. I dedicate my research project work to my family and many friends. A special feeling of gratitude to my loving parents, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my teacher who taught me that even the largest task can be accomplished if it is done one step at a time. Whose word of encouragement and push for tenacity ring in my ears, you have been my best motivator.

Acknowledgements

"I have taken much efforts in this project. However, it would not have been possible without the kind support and help of my supervisor. I would like to extend my sincere thanks to all of them.

I am highly indebted to our Supervisor **Zaman Aziz** for their kindness, guidance and constant supervision as well as for providing necessary information regarding the project and also for their support in completing the project.

I would like to express my gratitude towards my parents & team member for their kind co-operation and encouragement which help me in completion of this project.

My thanks and appreciations also go to my colleague in developing the project and people who have willingly helped me out with their abilities."

Executive Summary

Today online examination system is considered a fast developing examination method because of its accuracy and speed. It is also needed less manpower to handle the examination. It also helps to diminishing the need for paper. According to today requirement online examination system is significantly important to the educational system to prepare the exam, saving the time.

Examination scheduling is an important and one of the recurring administrative activities in almost all educational institutions. This system helps in arranging examination for student which determines when, where and how exanimation is to be conducted. Creating good examination timetable system that will satisfy students, lecturers and the institution management is a very difficult task due to the limited resources. This limitation makes exanimation scheduling very difficult to handle. This research is to create a Decision Support System that ensures the institution management, lecturers and student are well satisfied, and all institutional resources are fully utilized.

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List of Figures

Chapter 1

Introduction

Chapter 1: Introduction

In modern educational system, there is a great need to have an automated computer based exams scheduler. In manual system conducting exams for thousands of students of different subject is a headache for the administrators as well as for teachers.

CBEs scheduler is an easy web based application that eases to process of exams scheduling. Student can choose any slot, date, and venue from the available ones as per their own convenience and availability.

1.1. Background

Exam Scheduling requires a lot of time, effort and time.

Allocating invigilation (supervision) and paper-reading duties requires much time, effort and planning

Scheduling exam on paper and creating proper seating arrangement requires lot of man hours.

1.2. Motivations and Challenges

A computer based exams scheduling process might be hard to manage due to the involvement of some critical steps. As this is a fairly new system, and people are unaware of it, some problems may arise.

Internet connectivity is still a huge problem in rural and remote areas. In the case of a concurrent number of exams, internet connectivity can be a huge challenge for the smooth flow and execution of the online exam.

1.3. Goals and Objectives

The final system should able to generate time table in completely automated way which save a lot of time.

Ease of use for user of the system.

Focus on optimization of resource.

Provide a facility for everyone to view timetable.

1.4. Literature Review/Existing Solutions

Traditionally, the system of managing a university exams scheduler was done manually by doing paper work. All the schedules of students/faculties and allocating subjects/classes/time had to be managed on paper. So if there were any changes to be made in the timetable it has to be replaced everywhere manually in the whole timetable making it messy and more difficult. There was lot of manpower needed in this process and consumed more time. Thus the manual work was more and system was complex.
Then desktops or laptops were used to generate timetables which were produced by making tables consisting of particular subjects/classes/time and faculties required. This reduced the use of paper but the manual work was yet to be improved. At every place where there was any change in the schedule of faculty/student or adding any new faculty/subject it has to be changed manually everywhere thus consuming a lot of time.
Thus in our project the work of manually adding the subjects/classes/faculties and time has 2been erased due to the use of automated timetable generation which will be produced by giving subjects, faculties and time as inputs and generating a timetable as output. And whenever there will be any change in the schedule or there are any proxies the use of instant messaging provided in our project will help to solve the problems/clashes generated between students/classes thus saving time and manpower.

1.5. Proposed Solution

CBEs scheduler is an easy web based application that eases to process of exams scheduling. Student can choose any slot, date, and venue from the available ones as per their own convenience and availability.

1.6. Project Plan

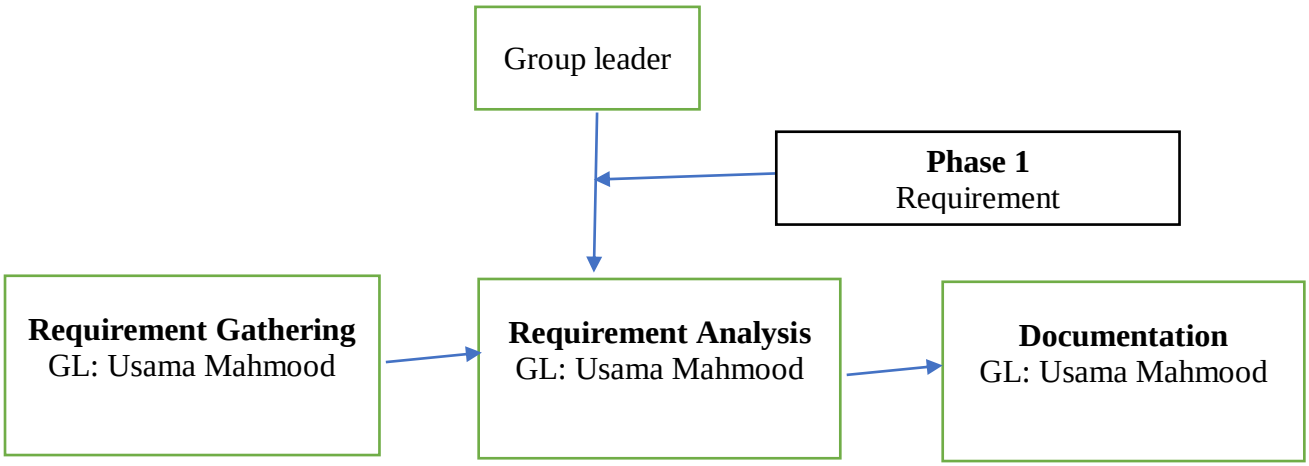
Establish business requirement

Establish schedule, list of deliverable and delivery dates.

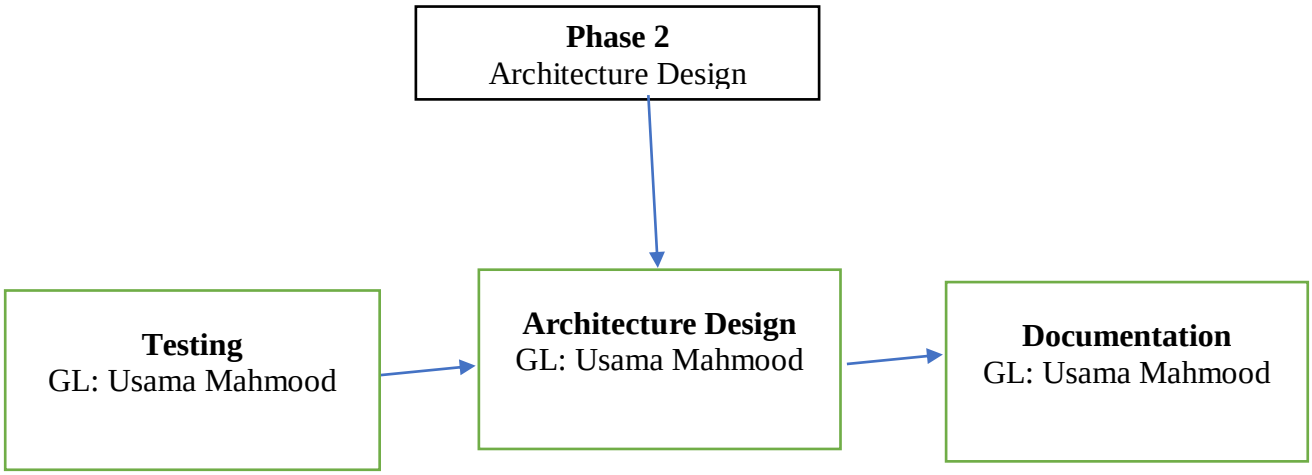
Obtain management approval and proceed to next phase.

1.6.1. Work Breakdown Structure

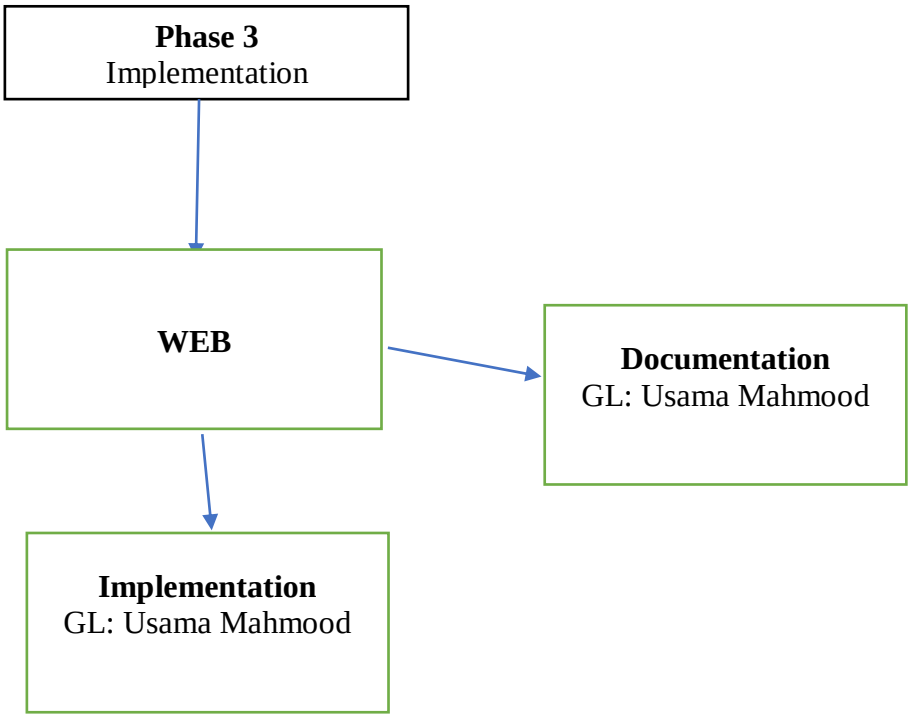
Phase 1



Phase 2: `



Phase 3:



1.6.2. Roles & Responsibility Matrix

Group leader:

Develop a project plan

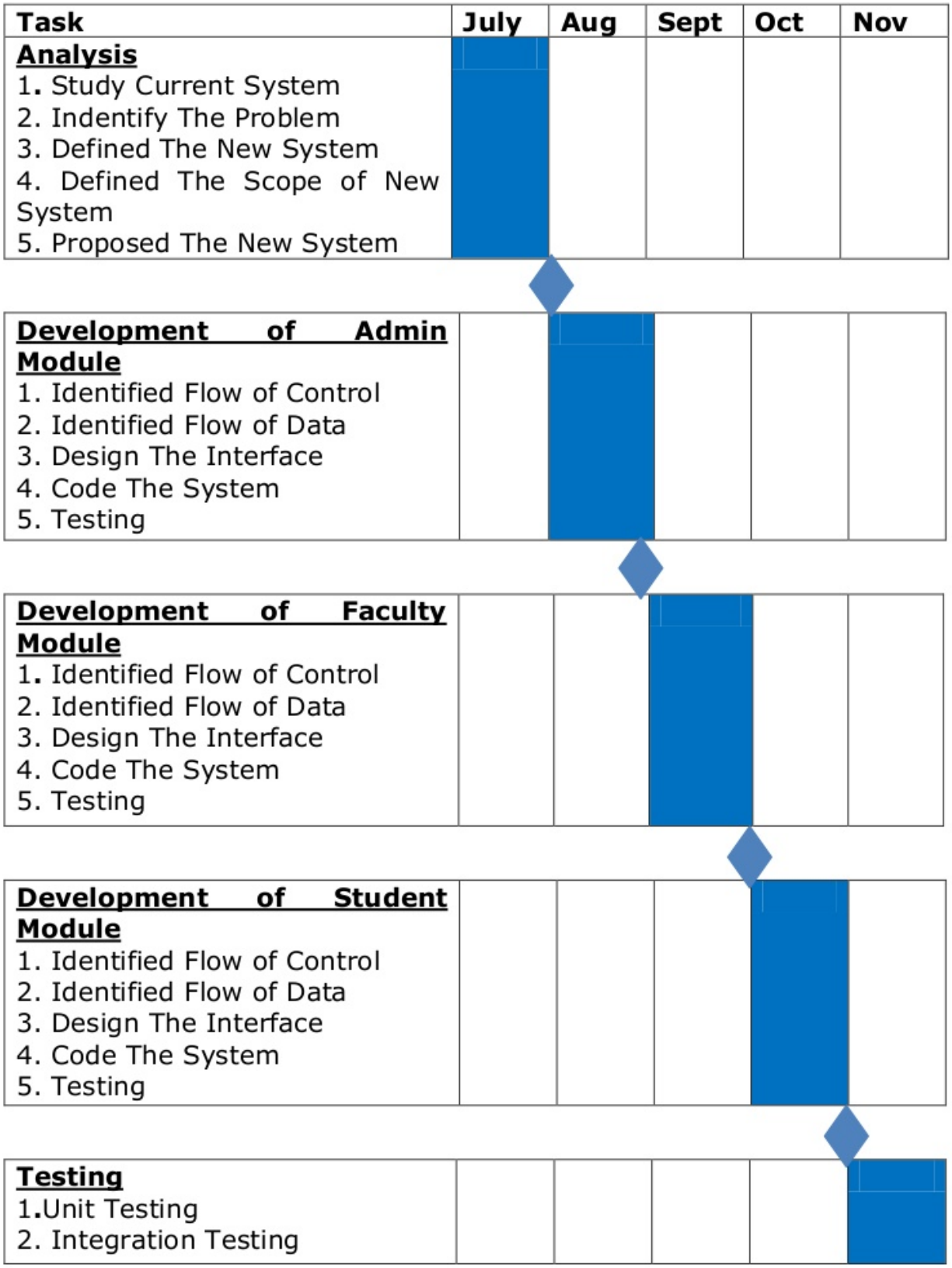
Lead and manage the project team

Determine the methodology used on the project

Assign task to project team member

Provide regular updates to upper management

1.6.3. Gantt Chart



1.7. Report Outline

Chapter 1 is the general introduction to the project. This gives the summary of projects and its objectives and scope and technology is being used for implementing this project.

Chapter 2

Software Requirement Specifications

Chapter 2: Software Requirement Specifications

2.1. Introduction

2.1.1. Purpose

The purpose of this document is to describe the external behavior of the system. In this document every kind of requirement is finalized. It describe the functional and non-functional requirement, design requirements and also provide the all other detail which will clear the whole idea about CBE scheduler.

2.1.2. Document Conventions

Document contain heading and paragraphs.

First heading: is bold, Font is Calibri and size is 16.

Second Heading: is bold, Font is Calibri and size is 14.

Paragraph: Font is Calibri and size is 12 and line spacing is 1.5

DB: Data Base

ERD: Entity Relationship Diagram

SRS: Software Requirement Specification.

API's: Application Programing Interface.

2.1.3. Intended Audience and Reading Suggestions

In first section the purpose of the document described, where every reader can understand the purpose of this document. In second section we described the product scope. So that, developer can understand the requirement of system. Designer can understand the design Requirements in the user interface requirement section.

2.1.4. Product Scope

We are developing online examination system for helping students and teacher to ensure better quality which they have interact in this system or enrichment for interactive UI which any user to easily or better understandable system which we have provide that is named as "CBE-Scheduler".

2.2. Overall Description

Vision of our project is to manage to the user to provide different feature related to requirements. Our system will work very easily on laptop. For user it is very easy to access.

2.2.1. Product Perspective

The development of a software from nothing to its released position is an important physical act from any software development company. Our product is for an institute.

User description:

It includes user code, name, address and phone number also. This information may be used for keeping the records of the user for any query or for any other kind of information.

Admin description:

Admin can hold on all information to store and manage in database or any query by user to responsively to response and good feedback provide by this system.

2.2.2. Product Functions

The software made will have the following functionalities.

- Creating prayer slot
- Generate multiple timetable
- Information store in database
- Academic calendar
- Exams scheduling.

2.2.3. User Classes and Characteristics

We defined different user classes in below table. Admin should have technical knowledge for interacting with system. While the student and instructor should know how to use the application.

classes	Functionality privilege	Technical/Non-technical
Admin	Add or delete instructor or student. Add or remove subject.	Technical knowledge

Instructor	Update quires, update timetable	Non-Technical knowledge
Student	View exams scheduler.	Non-Technical knowledge

2.2.4. Operating Environment

Our students and instructor can use CORE 2 Duo system with 8 GB RAM, 500 GB hard drive and 2.8 GHZs processor. Window 7 and Google chrome should installed in the system where our software will run. On the other side we will choose our specification where we will deploy on cloud.

2.2.5. Design and Implementation Constraints

Php Storm:

Php storm features a rich and intelligent code editor for PHP that actually "gets" your code and deeply understands its structure.

Code igniter:

Code igniter is a framework of php which we design and maintain our dashboard so reliable or efficient work by using this framework.

Sql Server:

We will Sql server is used for creation of our database. Sql database can be handled easily with ASP.Net. So that's why it is a good tool for database operations.

Adobe Photoshop:

We will use adobe Photoshop for creation of logo of our website and application. Moreover, other design things of a website can also be easily managed by Photoshop and we will do that.

HTML:

We will use html because it is the basic means to generate a website. Without this language we cannot create website.

CSS:

We will use CSS to style our website according to our requirements. As styling is also a main thing in our website so we will use this language.

JavaScript:

We will use JavaScript as a client-side scripting language. This means that JavaScript code is written into HTML page.

Angular JS:

AngularJS is a JavaScript framework. It is a library written in JavaScript.

AngularJS is distributed as a JavaScript file, and can be added to a web page with a script tag.

Bootstrap:

Bootstrap is the most popular HTML, CSS and JavaScript framework for developing responsive websites.

2.2.6. User Documentation

We will organize seminar and provide tutorials for system users learning.

2.2.7. Assumptions and Dependencies

In future due to large data may be we will have need advance database system to manage our records. Moreover if any new subject comes in future and institute demand for it then we will add it according to system requirement.

2.3. External Interface Requirements

2.3.1. User Interfaces

An interface is provided in which all the options will appear, user can easily interact with the website and application to select multiple features like time schedule update, event display update etc. If any error occurs an error box will be shown which shows the error and its solution message. Standard options will be provided to select the categories of the time schedule, event display etc.

- This online system will have a very good and fresh color scheme.
- It will have a very good impression on user mood.
- Color scheme will follow the Human Computer Interaction rules.

2.3.2. Hardware Interfaces

Our system will work through internet connectivity. So we will use all those hardware devices and configuration that will use to connect with internet. So we need the Modems, Wires, WAN, LAN network and Ethernet Cross cables etc.

2.3.3. Software Interfaces

Software used	Description
Operating system	We have chosen windows operating system for the best support and its friendliness.
Data base	For sorting database we chose My SQL.
Tools	We will chose java Script, Jquery, PhpStorm and My SQL server.
Libraries	Data table, code-igniter framework library, Database library, session library
Component	Payment verification alerts**.**

2.3.4. Communications Interfaces

This project supports most of the web browsers. E.g. Chrome, Internet Explorer.

The protocol used shall be HTTP.

2.4. System Features

Admin

Admin can register student and teachers.

Admin should be able to view the details of student and teachers.

Admin should be able to update teacher info.

Admin can assign rooms to teacher for invigilation.

Admin should be able to add/update rooms for exams.

Admin should be able to add/update subject.

Admin should be able to add/ update details of exams.

Student

Student can enrolled itself.

Student can view exams schedule.

Student can select time slot for exams that are updated by admin.

Student can view his info.

Student can view his exam schedule (date sheet).

Teacher

Teacher can view exam scheduler.

Teacher can view his info.

2.5. Other Nonfunctional Requirements

2.5.1. Performance Requirements

The system should be easy to use and interactive interface.

System should be speedy and reliable.

System should be easily approach able.

System should be user friendly.

Performance much important to this system.

2.5.2. Safety Requirements

If the network is slow in performance then it can irritate client and client can reject it due to slow performance of network.

If the data on server is not according to the user requirement then it can be rejected by the user.

If the system is very complex which cannot access by the client easily then it is failure of the system.

The documentation relating to test planning test design specification, test specification development and test cases development should do accurately and efficiently otherwise it can lead the failure of the test.

2.5.3. Security Requirements

Website should be encrypted and secured by https protocol.

Information of the register user should not be public.

Non-register user cannot be login.

2.5.4. Software Quality Attributes

Correctness: system should perform all task accurately. System should provide accurate and up to date information.

Flexibility: system should be flexible if in future user want any change then system should allow the developers to extend or change the system.

Maintainability: system should be maintainable mean if we want to maintain any functionality then system must allow to change it.

Portability: system should be portable. System must be workable on every operating system in any kind of environment.

Reliability: system should be reliable. System should work continuous, also in critical condition. System should not be failed when users increased.

Reusability: system feature must be reusable, if same feature needs in near future for any other project, then system should be reuse.

Robustness: every system crashes, but crashes should be occur in handsome way. So our system produce alert before crashes or in not working condition.

Testability: all system feature should testable.

Usability: all system feature should be useable and user friendly. System should execute effectively and efficiently. And last system UI should be understandable.

2.5.5. Business Rules

Manager: can add or remove instructor or student. He can update any course and timetable.

Instructor: can view and edit his info and view timetable.

Student: can enroll himself in different subjects and view his time table

2.6. Other Requirements

Work should be done according to all standard methods and rules. No industry rule should violate.

Chapter 3

Use Case Analysis

Chapter 3: System Analysis

3.1. Use Case Model

3.2. Fully Dressed Use Cases

3.1 Add a new Student

Use Case:	**Add_Student**
Actors:	**Admin**
Features:	**Web Form**
Scope/Overview:	If admin wants to create an account for student. Initially admin person open web application and then go on add student screen. Then he/she must provide the first name and last name, phone, email, password etc. Then proceed further.

Pre-condition:	1- Connection on internet is established(optional) 2- Must have authority to add a student.
Scenarios:	1) Click on signup link 2) Enter First Name 3) Middle or Last name 4) Phone and Email 5) Address and CNIC 6) Click Submit 7) Register student
Alternative scenarios:	Username,Firstname AND/OR Middlename AND/OR Lastname AND/OR Phone, Email AND/OR Address
Post-Conditions:	1) Student added successfully 2) Student is Registered 3) Data is saved in database 4) Confirmation message alert 5) Stay on the same page
Use case Cross referenced:	**None**

3.2 Add a new teacher

Use Case:	**Add_Teachers**
Actors:	**Admin**
Features:	**Web Form**
Scope/Overview:	If admin wants to create an account for teacher. Initially admin person open web application and then go on add student screen. Then he/she must provide the first name and last name, phone, email, password etc. Then proceed further.
Pre-condition:	3- Connection on internet is established(optional) 4- Must have authority to add a student.
Scenarios:	8) Click on signup link 9) Enter First Name 10) Middle or Last name 11) Phone and Email 12) Address and CNIC 13) Click Submit 14) Register student
Alternative	Username,Firstname AND/OR

scenarios:	Middlename AND/OR Lastname AND/OR Phone, Email AND/OR Address
Post-Conditions:	6) Teacher added successfully 7) Teacher is Registered 8) Data is saved in database 9) Confirmation message alert 10) Stay on the same page
Use case Cross referenced:	**None**

3.3 Add a new Teacher

Use Case:	**Add_Teacher**
Actors:	**Admin**
Features:	**Web Form**
Scope/Overview:	If admin wants to create an account for teacher. Initially admin person open web application and then go on add teacher screen. Then he/she must provide the first name and last name, phone, email, password, CNIC etc. Then proceed further.
Pre-condition:	1- Connection on internet is established(optional) 2- Must have authority to add a teacher.
Scenarios:	1) Click on signup link 2) Enter First Name 3) Middle or Last name 4) Phone and Email 5) Address and CNIC 6) Click Submit 7) Register teacher
Alternative scenarios:	Username, Firstname AND/OR Middlename AND/OR Lastname AND/OR Phone, Email AND/OR Address, CNIC AND/OR
Post-Conditions:	1) Teacher added successfully 2) Teacher is Registered 3) Data is saved in database 4) Confirmation message alert 5) Stay on the same page
Use case Cross referenced:	**None**

3.4 Student Login

Use Case:	**Student_login**
Actors:	**Student**
Features:	**Web Form**
Scope/Overview:	If student wants to login. Initially he/she open website and then go on login student screen. Then he/she must provide the username, password. Then proceed further.
Pre-condition:	1- Connection on internet is established. 2- Must have authority to add a student.
Scenarios:	1) Click on login button 2) Enter username 3) Enter password
Alternative scenarios:	Username, password
Post-Conditions:	1) Student login successfully 2) Data is load in database 3) Confirmation message alert when sign up 4) Stay on the same page
Use case Cross referenced:	student_registerd

3.5 Teacher Login

Use Case:	**Teacher_login**
Actors:	**Teacher**
Features:	**Web Form**
Scope/Overview:	If teacher wants to login. Initially he/she open website and then go on login teacher screen. Then he/she must provide the username, password. Then proceed further.
Pre-condition:	1- Connection on internet is established. 2- Must have authority to add a student.
Scenarios:	1) Click on login button 2) Enter Username 3) Enter password
Alternative scenarios:	Username, password
Post-Conditions:	1) Teacher login successfully 2) Data is load in database 3) Confirmation message alert when sign up 4) Stay on the same page

Use case Cross referenced:	teacher_registerd

3.6 Admin Login

Use Case:	**Admin _login**
Actors:	**Admin**
Features:	**Web Form**
Scope/Overview:	If admin wants to login. Initially he/she open website and then go on login teacher screen. Then he/she must provide the username, password. Then proceed further.
Pre-condition:	3- Connection on internet is established. 4- Must have authority to add a student.
Scenarios:	4) Click on login button 5) Enter Username 6) Enter password
Alternative scenarios:	Username, password
Post-Conditions:	5) Teacher login successfully 6) Data is load in database 7) Confirmation message alert when sign up 8) Stay on the same page
Use case Cross referenced:	Admin_registerd

3.7 enrollment

Use Case:	**Enrollment**
Actors:	**Student**
Features:	**Web Form**
Scope/Overview:	If student want to enroll himself in exam. Initially student person open web application and then go on enrollment screen. Then proceed further.
Pre-condition:	1- Connection on internet is established(optional) 2- Must have authority to add a student.
Scenarios:	1) Click on signup link 2) Enter First Name 3) Middle or Last name 4) Phone and Email 5) Address and CNIC 6) Select subject 7) Enroll
Alternative	Username,Firstname AND/OR

scenarios:	Middlename AND/OR Lastname AND/OR Phone, Email AND/OR Address
Post-Conditions:	1) Student enrolled himself in exams successfully 2) Data is saved in database 3) Confirmation message alert 4) Stay on the same page
Use case Cross referenced:	**None**

3.8 Add room

Use Case:	**Add_room**
Actors:	**Admin**
Features:	**Web Form**
Scope/Overview:	If admin wants to select room for student. Initially admin person open web application and then go on add room screen. Then proceed further.
Pre-condition:	1- Connection on internet is established(optional) 2- Must have authority to add a student.
Scenarios:	1) Enter First Name 2) Middle or Last name 3) Phone and Email 4) Add room no. 5) Click Submit 6) Add room successfully
Alternative scenarios:	Username,Firstname AND/OR Middlename AND/OR Lastname AND/OR Phone, Email AND/OR Address
Post-Conditions:	1) Room added successfully 2) Data is saved in database 3) Confirmation message alert 4) Stay on the same page
Use case Cross referenced:	**None**

3.9 Student Time Schedule

Use Case:	**Time_schedule**
Actors:	**Student**
Features:	**Web Form**
Scope/Overview:	If user wants to login their account then they follow procedure which describe in this us case. Initially they open website and then go on login screen. Put their valid details tha student time schedule will be appear selection on section based & properly tim schedule shown before exams started.
Pre-condition:	1- Connect to the internet established. 2- Students remember their login username and password. 3- Student is registered. 4- Current student is not logged in already.
Scenarios:	1) Click on login Link 2) Enter Username 3) Enter password 4) Student shown time table & update by section or class. 5) Properly time table show on class or section. 6) View on Dashboard
Alternative scenarios:	1) Username is invalid 2) Password is invalid 3) Schedule will be not shown 4) System not response
Post-Conditions:	1) Login Successfully 2) Student will be show dashboard 3) Notification appear of schedule when select section completed 4) Update the record student see schedule 5) Session established & get started 6) Redirect to home page after see schedule 7) Stay on the same (user account) page
Use case Cross referenced:	**student_login**

3.10 Chat_pro

Use Case:	**Chat_pro**
Actors:	**Admin**
Features:	**Web Form**
Scope/Overview:	If admin wants to discussion related exams schedule & to clearly response on same stage as well.

Pre-condition:	1- Connect to the internet established 2- Admin is logged in
Scenarios:	1) Click on chat pro link 2) Enter login info 3) Enter chat pro to discussion chat view confirmation 4) Send & Receive
Alternative scenarios:	1) Login AND/OR
Post-Conditions:	1) Chat pro appeared successfully 2) Confirmation message send & receiveis shown 3) Discuss on related topics 4) Stay on the same (user account) page
Use case Cross referenced:	**none**

3.3. Fully Dressed Use Cases

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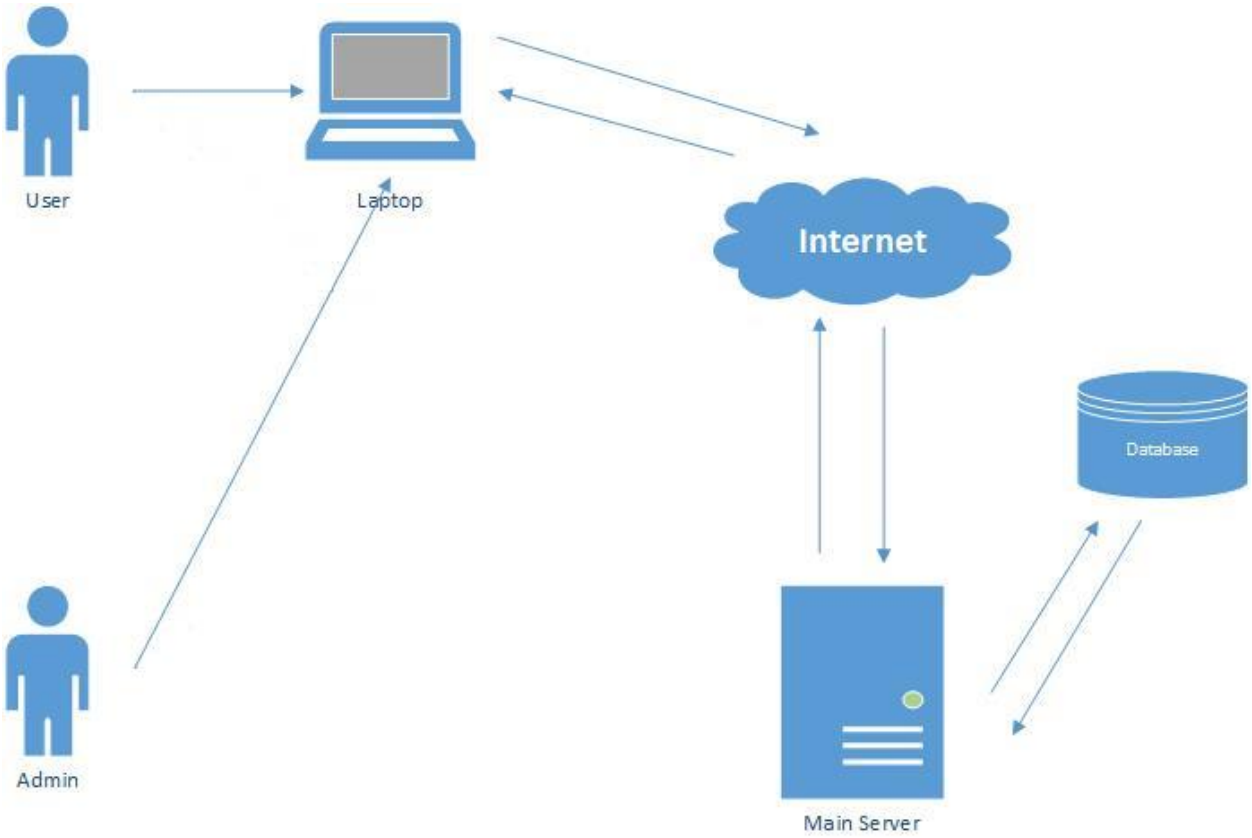
Chapter 4

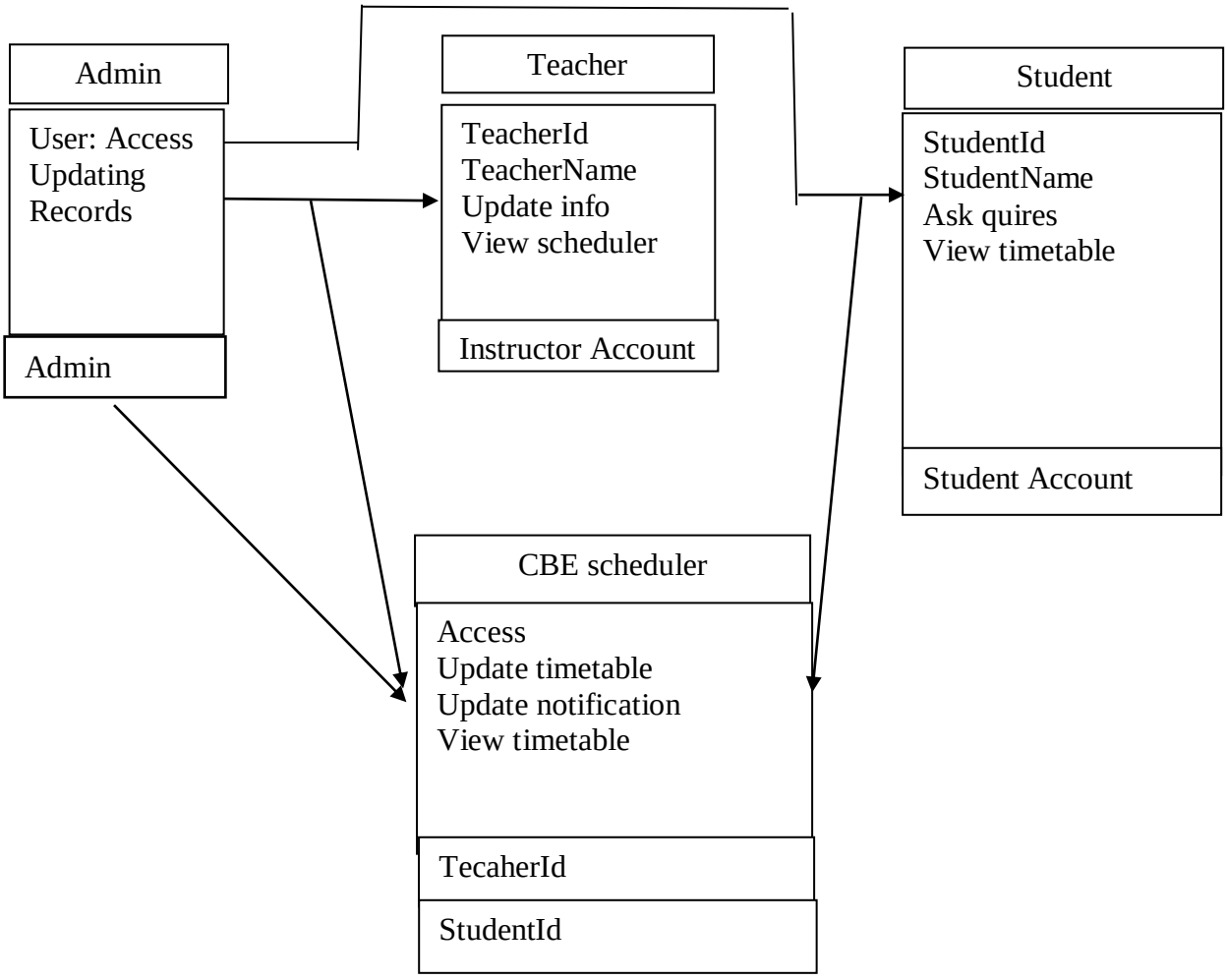
System Design

Chapter 4: System Design

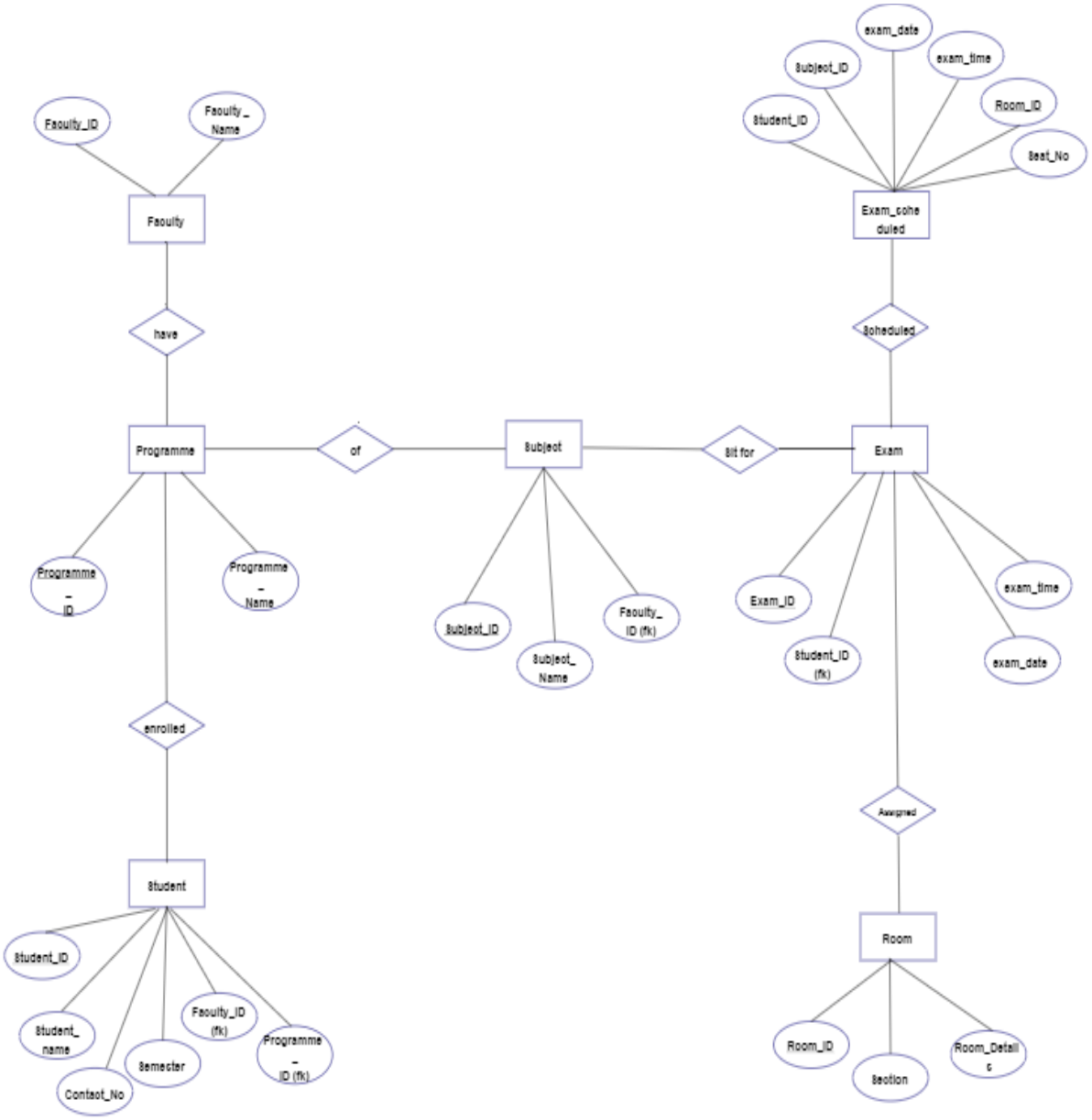
4.1. Architecture Diagram



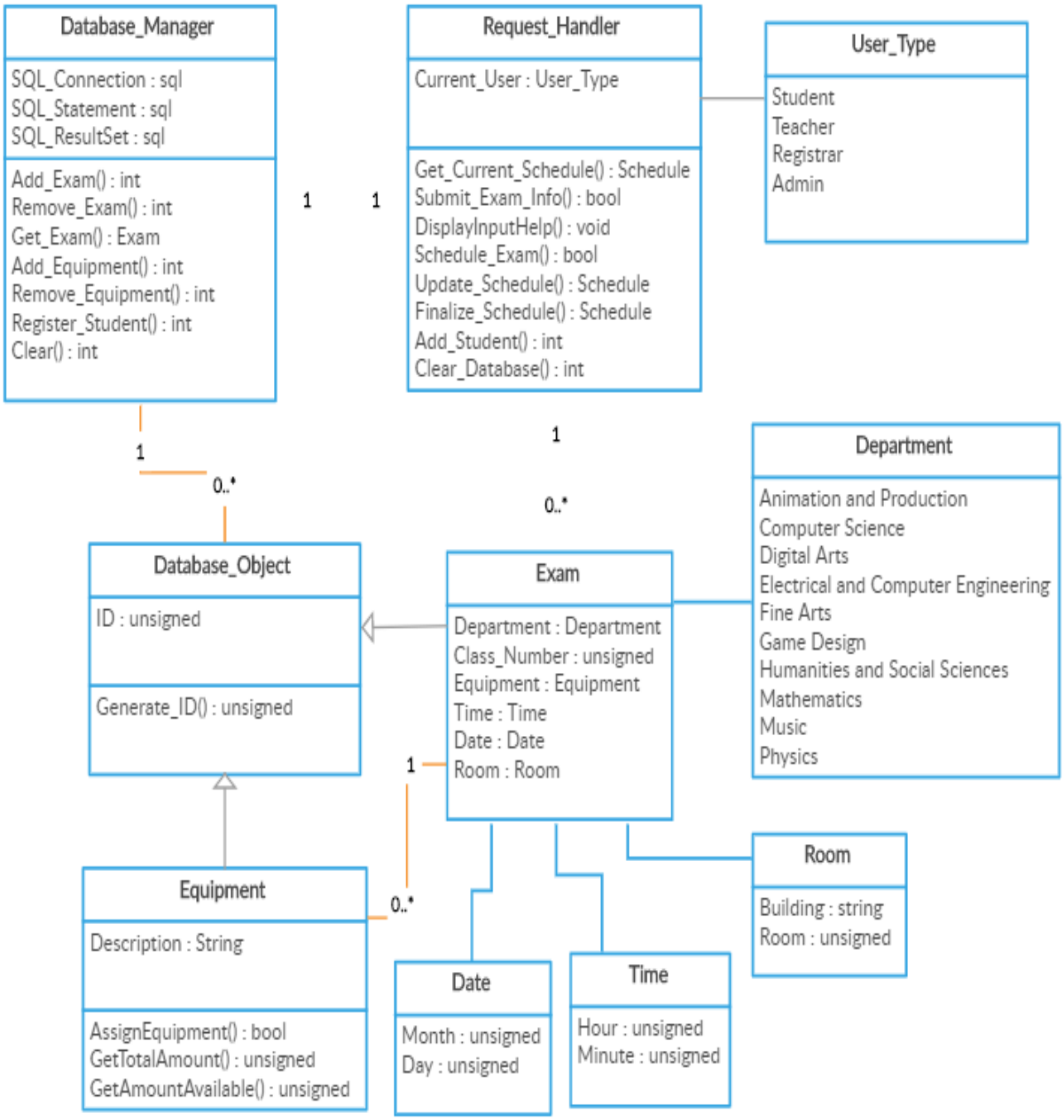
4.2. Domain Model



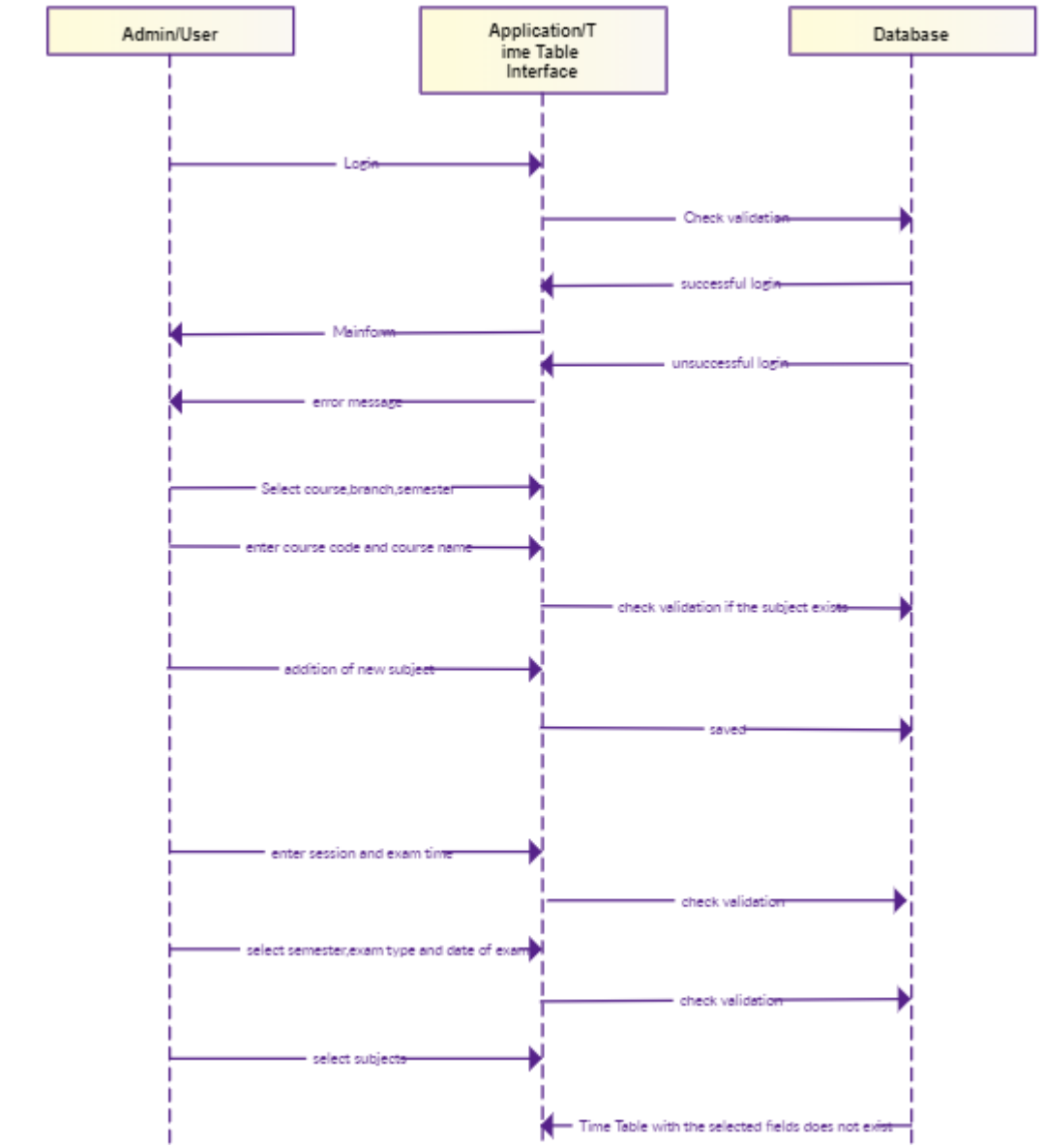
4.3. Entity Relationship Diagram with data dictionary

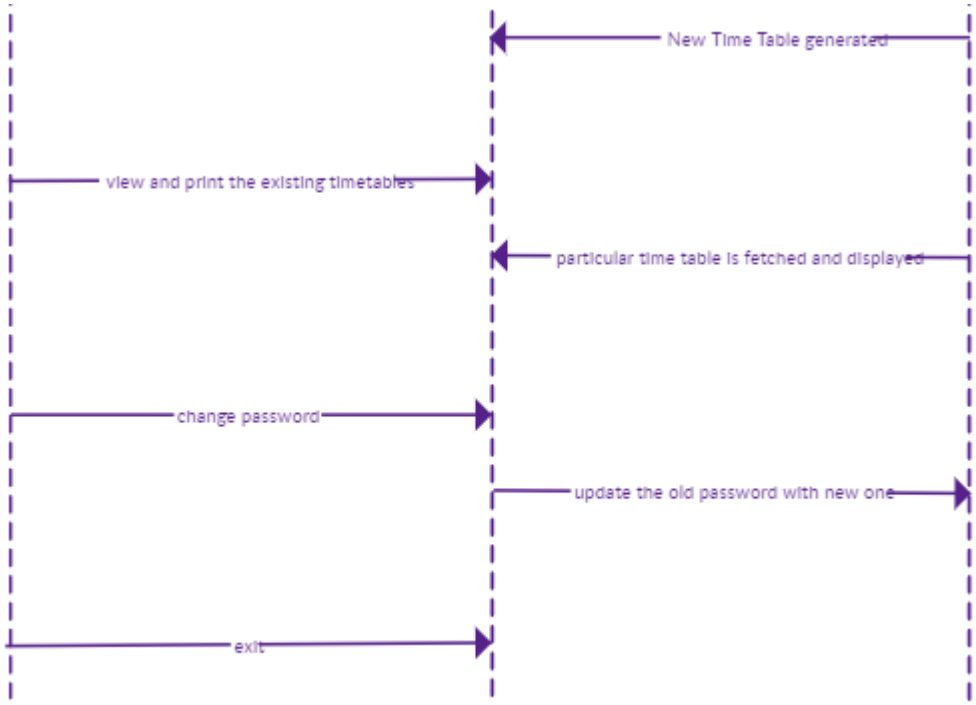


4.4. Class Diagram

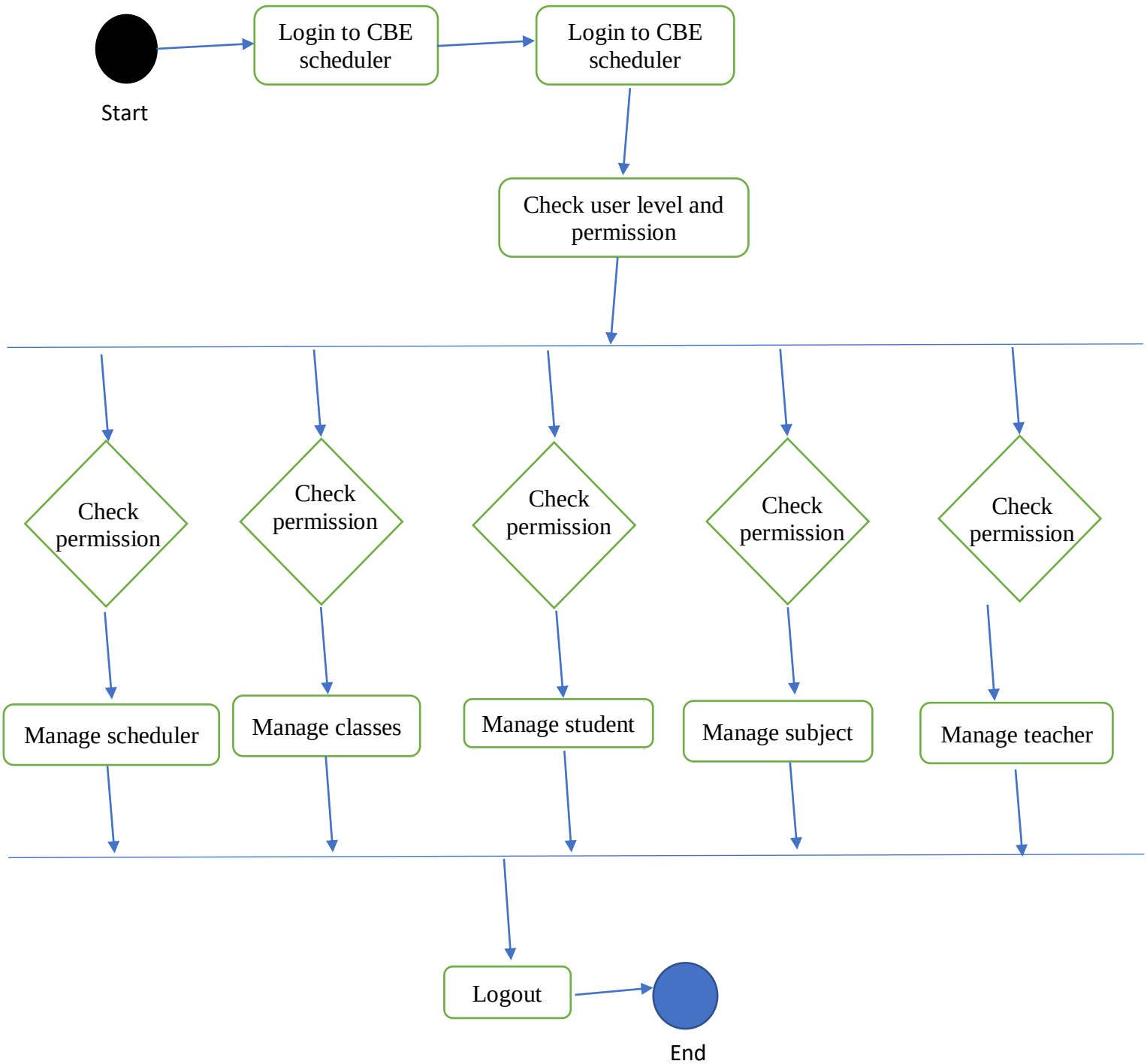


4.5. Sequence / Collaboration Diagram

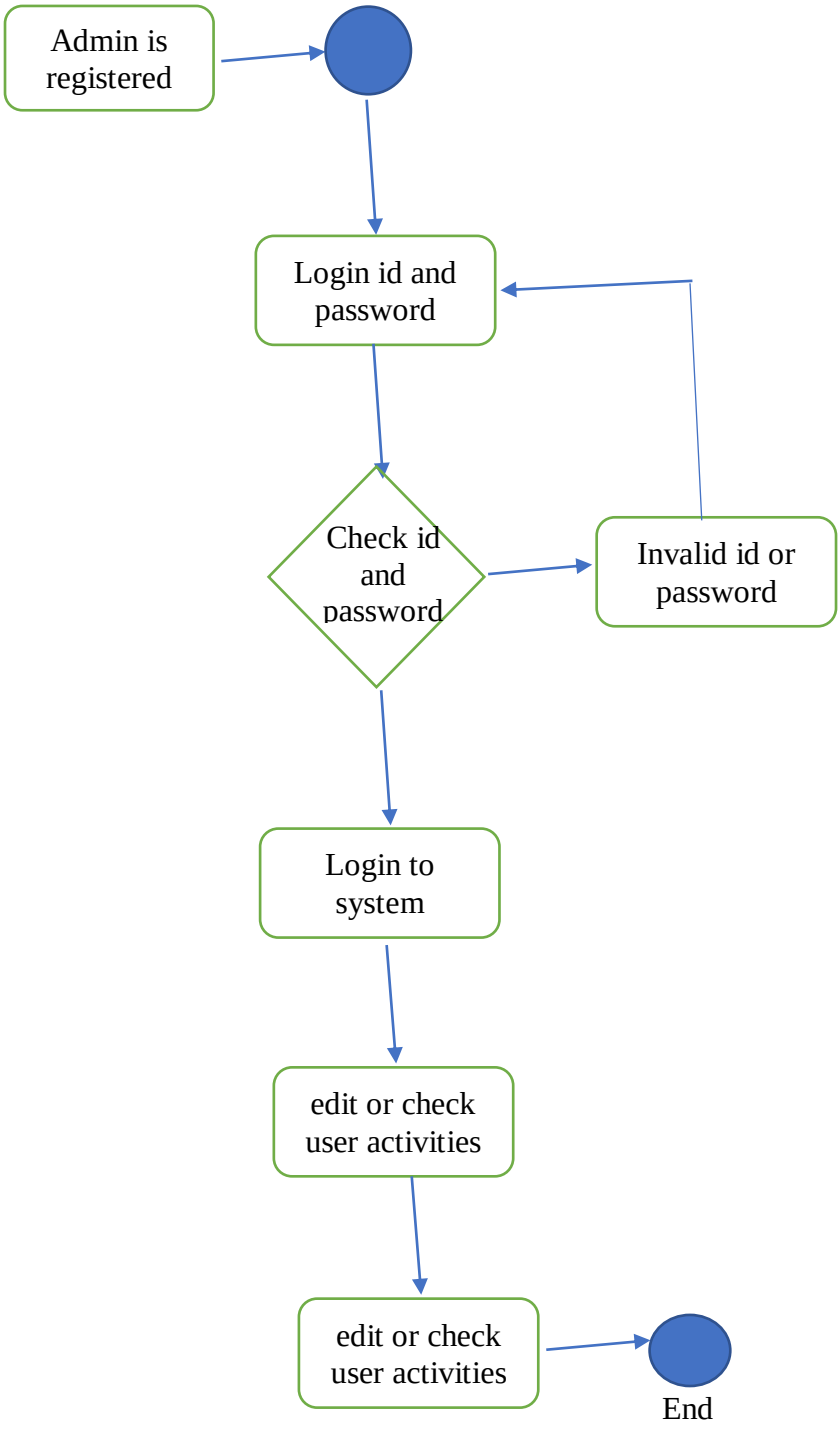



New Time Table generated
view and print the existing timetables
particular time table is fetched and displayed
change password
update the old password with new one
exit

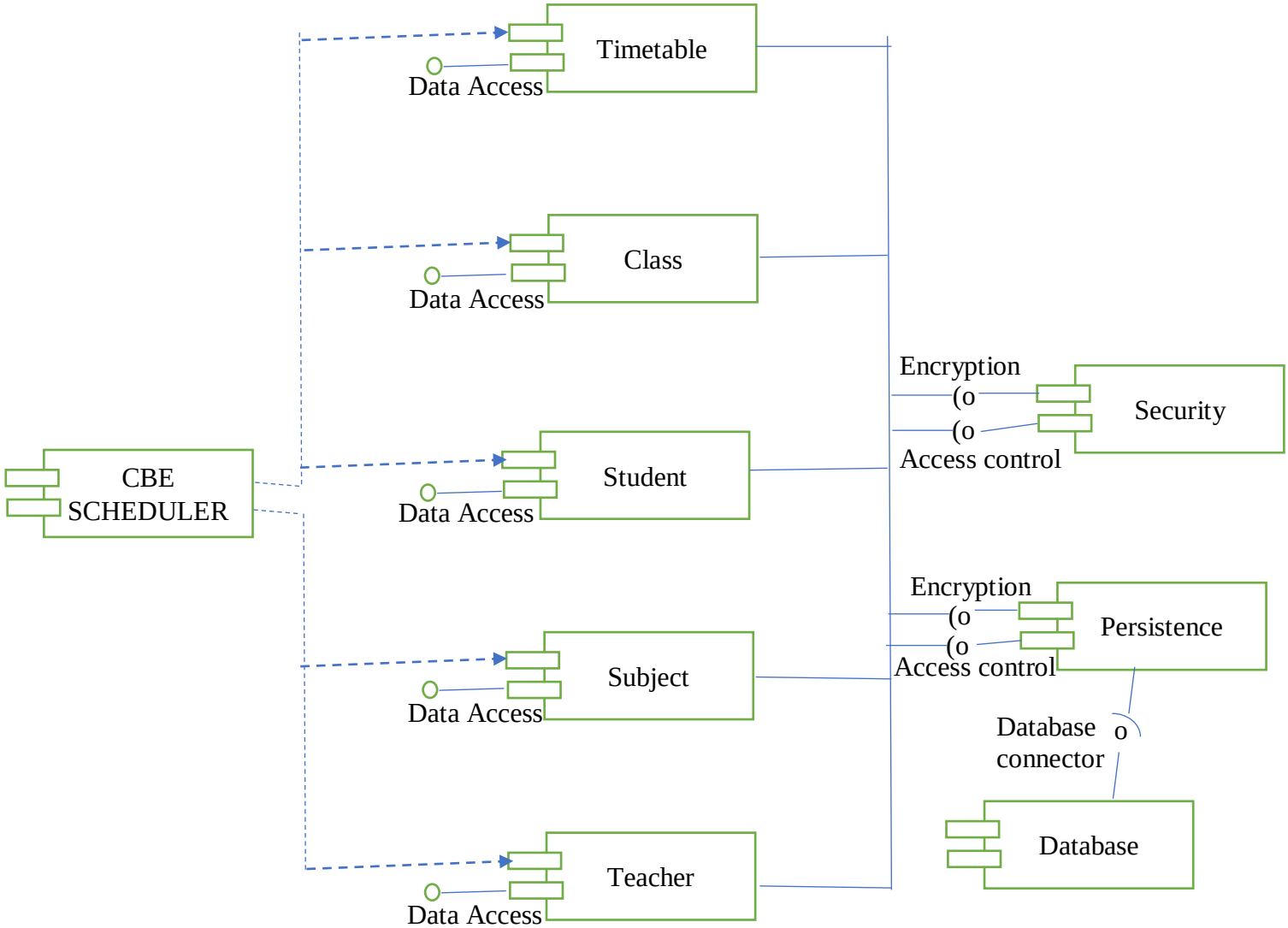
4.6. Activity Diagram



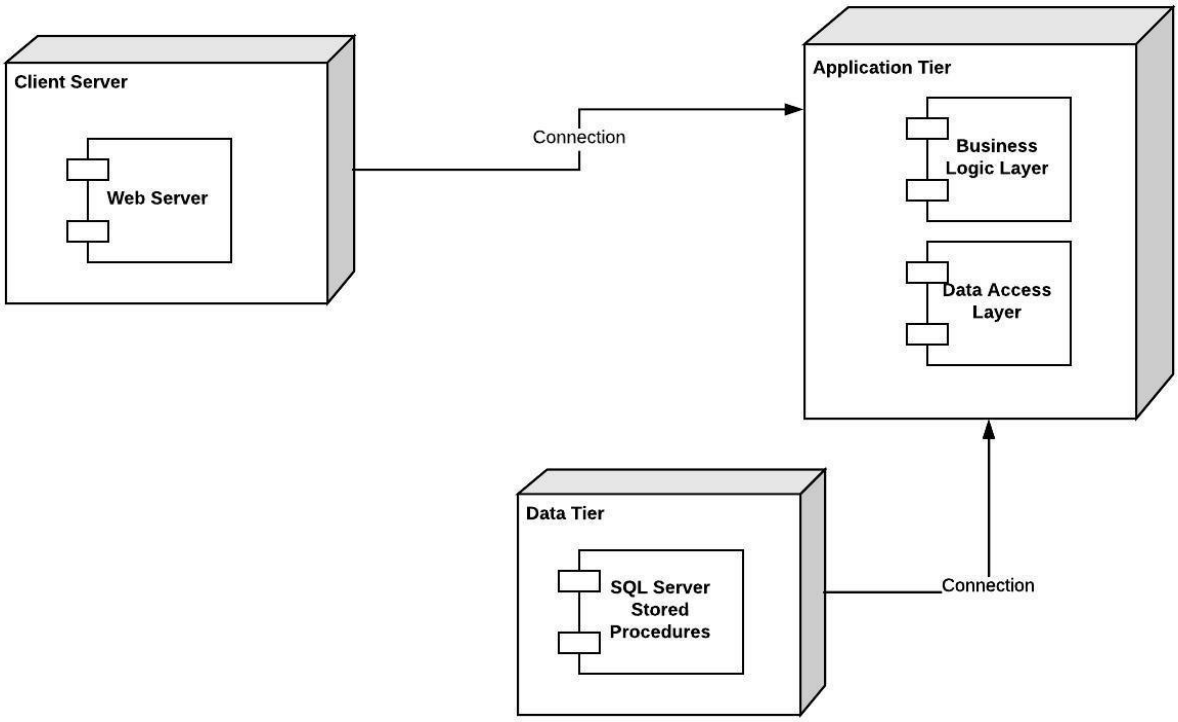
Admin:


Admin is registered
Login id and password
Check id and password
Invalid id or password
Login to system
edit or check user activities
edit or check user activities
End

4.7. Component Diagram

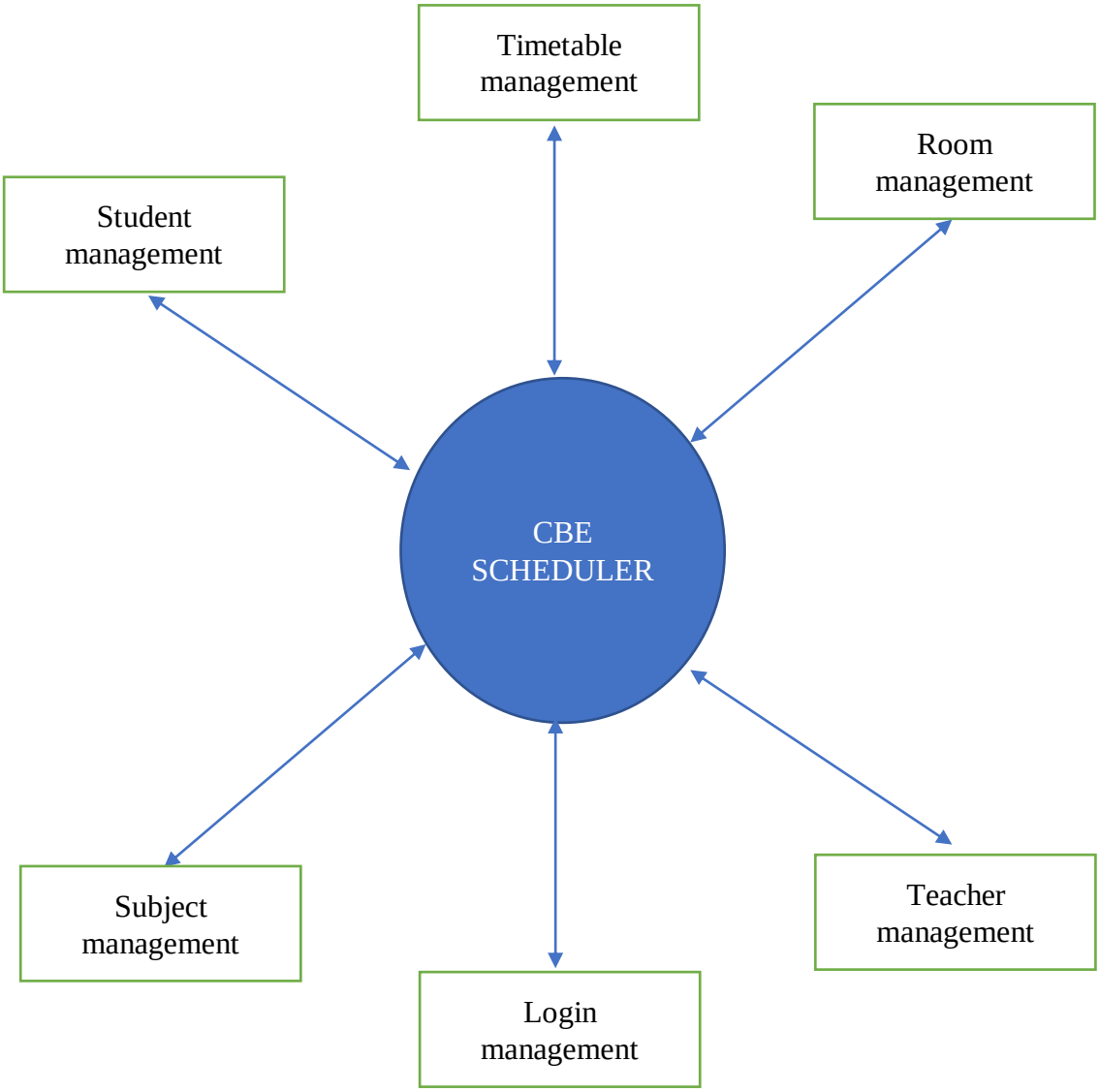


4.8. Deployment Diagram

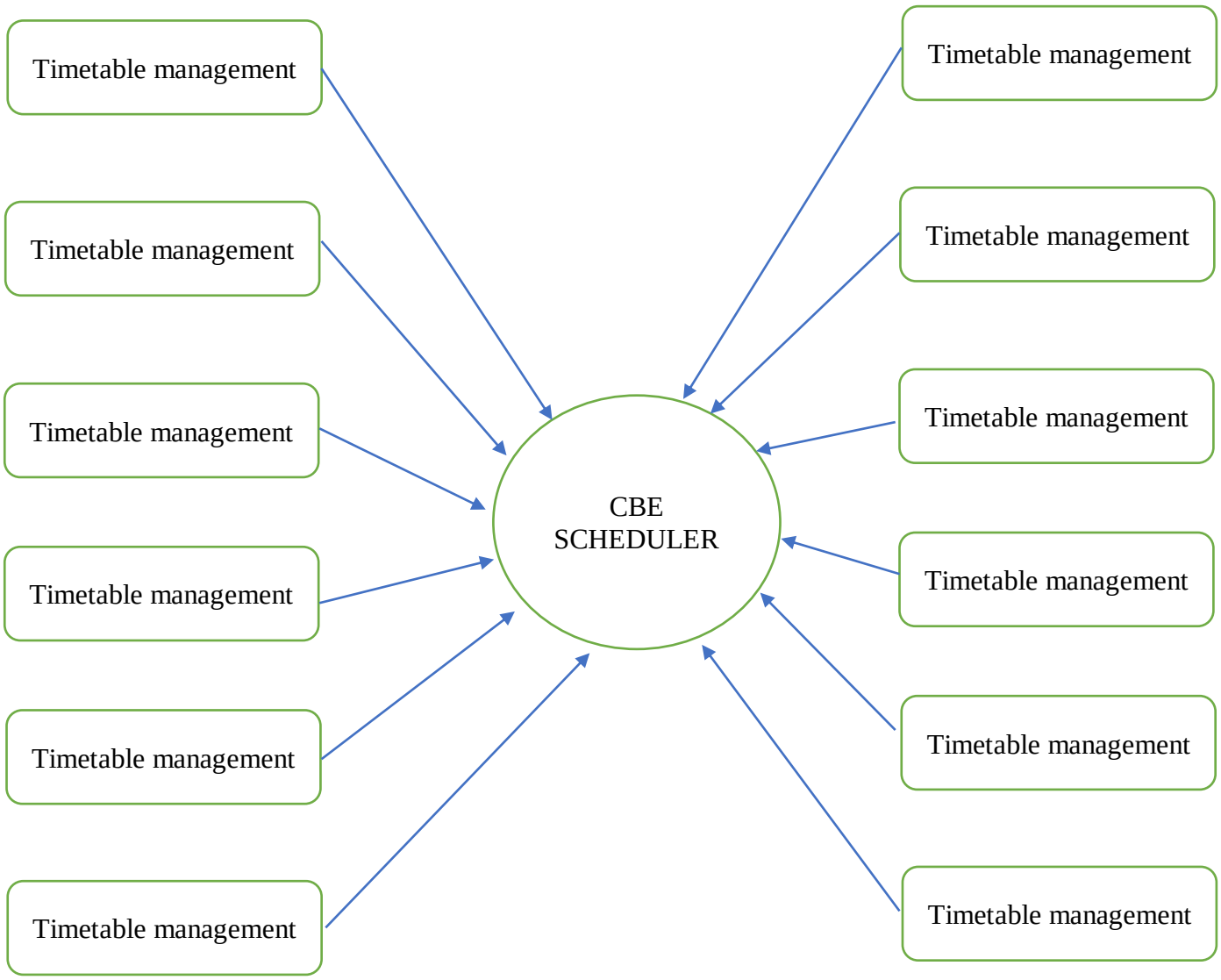


4.9. Data Flow diagram

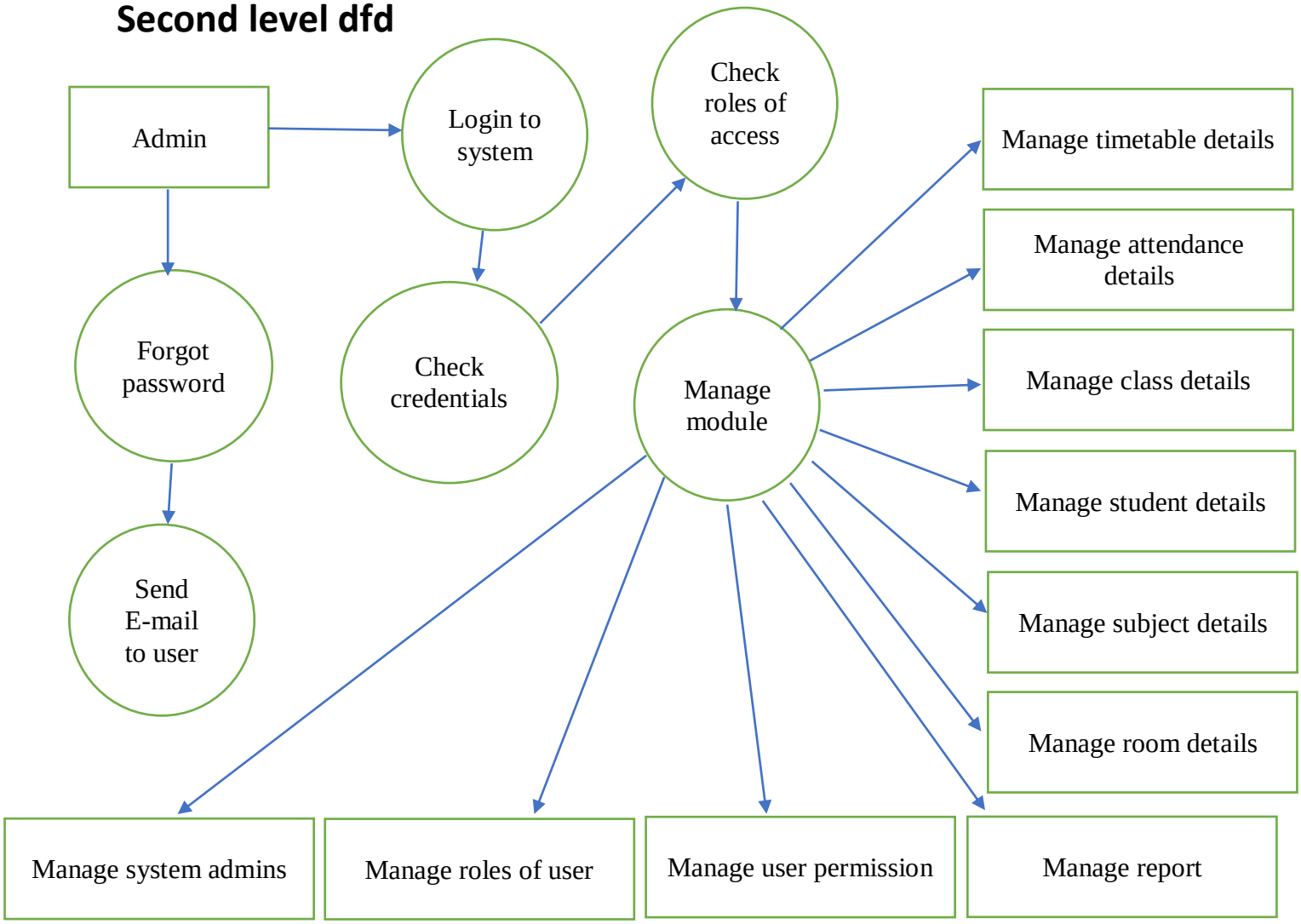
Zero level DFD



First level dfd



Second level dfd



Chapter 5

Implementation

Chapter 5: Implementation

5.1. Important Flow Control/Pseudo codes

For all other user (Instructor and Admin) are compulsory to login to access the Exams scheduler.

Firstly an admin can add or edit scheduler moreover he can update system and his info.

Secondly, an instructor can view his timetable or exam scheduler for class invigilation.

And last a student can only view the timetable.

5.2. Components, Libraries, Web Services and stubs

Library: Data table, code-igniter framework library, Database library, session library

5.3. Deployment Environment

Hardware: core 2 duo, 500 GB Hard Drive,2.8 GHz,8GB RAM

Operating system: window 7

Application: Google chrome

Framework: code-igniter

5.4. Tools and Techniques

Development tools

Web application: Php storm, My SQL

Software designing tools: adobe photo shop, Dream viewer

Testing tool: php Unit

Documentation tool: Microsoft Office

Techniques:

Web application techniques:

MVC (model view controller), php , html/css, javaScript, Jquery , Sql

Testing technique:

We will use V model which will cover all these testing technique.

Unit testing, integration testing, system testing and alpha and beta acceptance testing.

5.5. Best Practices / Coding Standards

Maintain documentation of code

Not used short tags.

Meaning full variable and function names.

Never use function in loop.

5.6. Version Control

We will use TortiseSVN for code versioning. Where we can handle our project with speed and efficiency. We can easily manage and share our code with other team members by using it.

Chapter 6: Testing and Evaluation

Software testing is very important because of the many reasons; Softwaretesting is required to point out the defects and errors that were made during the development phases. It is essential since it makes sure reliability in the application. It is very important to ensure the Quality of the product. Evaluation can help you identify areas for improvement and ultimately help you realize your goals more efficiently.

6.1 Use Case Testing

Use Case Testing is defined as a software testing technique, that helps identify test cases that cover the entire system, on a transaction by transaction basis from start to the finishing point.

Id	Test case description	Procedure	Expected output	Result
TC1	Update information	1-click on home page 2- enter full name 3-enter user name 4-enter password 5- confrm password 6- enter old password to confirm change (if you have)	Account detail update	Pass
TC2	Add teacher	1- Add salutation (Mr. Miss, Dr etc) 2- Enter first name 3- Enter second name 4- Add rank (Prof, Lect etc) 5- Add department 6- Add designation (dean, faculty etc)) 7- Add status (user, admin) 8- Click on “save” button	Teacher add successfully	Pass
TC3	Add subject	1- Add subject code 2- Add subject title 3- Click on “Save” button	Subject added successfully	Pass
TC4	Update subject	1- Enter previous subject code 2- Enter new subject code	Subject updated successfully.	Pass

		3- Click on “update” button		
TC5	Add room	1- Add room 2- Click on “save” button	Room added successfully	Pass
TC6	Update room	1- Click on edit icon 2- Update room info 3- Click on “update” button	Room updated successfully	Pass
TC7	Add class	1- Add class name 2- Click on “save” button	Class added successfully	Pass
TC8	Update Class	1- Click on edit button 2- Update class info 3- Click on” update” button	Class update successfully	Pass
TC9	Add Department	1- Add department code 2- Add department name 3- Click on “save” button	Department added successfully	Yes
TC10	Update department	1- Click on edit icon 2- Update department code or name	Department name or code edit successfully.	Yes
TC11	Add Designation	1- Add designation 2- Click on “save” button	Designation added successfully	Yes
TC12	Update Designation	1- Click on edit icon 2- Update Designation	Designation updated successfully.	Yes
TC13	Add program	1- Add program code 3- Add program title 2- Click on “save” button	programadded successfully	Yes
TC14	Update department	1- Click on edit icon 2- Update program code or name 3- Click on “update” button	Program name or code updated successfully.	Yes
TC15	Add rank	1- Add rank 2- Click on “save” button	Rank added successfully	Yes
TC16	Update rank	1- Click on edit icon 2- Update rank 3- Click on “update” button	Rank update successfully.	Yes
TC17	Add salutation	1- Add salutation 2- Click on “save” button	salutation added successfully	Yes

TC18	Update salutation	1- Click on edit icon 2- Update Salutation 3- Click on “update” button	salutation update successfully.	Yes
TC19	Add school year	1- Add school year 2- Click on save button	School year added successfully	Yes
TC20	Add time schedule	1- Add exams starting time 2- Add exams ending time 3- Add days 4- Click on “save” button	Time added successfully	Yes
TC21	Print scheduler	1- add teacher name 2- add subject code 3- add course year and section 4- add room number 5- add remarks 6- select time slots 7- click on “save” button	Exams scheduler successfully updated.	Yes

6.2.Equivalence partitioning

Equivalent Class Partitioning is a black box technique (code is not visible to tester) which can be applied to all levels of testing like unit, integration, system, etc. In this technique, you divide the set of test condition into a partition that can be considered the same.

- It divides the input data of software into different equivalence data classes.
- You can apply this technique, where there is a range in the input field.

6.3. Boundary value analysis

Boundary testing is the process of testing between extreme ends or boundaries between partitions of the input values.

- So, these extreme ends like Start- End, Lower- Upper, Maximum-Minimum, Just Inside-Just Outside values are called boundary values and the testing is called "boundary testing".
- In Boundary Testing, Equivalence Class Partitioning plays a good role
- Boundary Testing comes after the Equivalence Class Partitioning.

6.4. Data flow testing

Data Flow testing is one of the testing strategies, which focuses on the data variables and their values, used in the programming logic of the software product, by making use of the control flow graph. Data flow testing is the form of **white box testing** and **structural type testing**, which generally keeps check at the points, where the data values are being received by the variables, and at the points, when it is called for use. It is used to fill the gap between the **path testing** and **branch testing**.

The basic idea behind this form of testing, is to reveal the coding errors and mistakes, which may results in to improper implementation and usage of the data variables or data values in the programming code i.e. data anomalies, such as

- All the data variables, present in the programming code have been initialized or not,
- Data variables which are put into use, have been, priorly initialized or not,
- If the initialized data variables, has been used, at least once, in the programming code.

6.5. Unit testing

UNIT TESTING is a level of software testing where individual units/ components of a software are tested. The purpose is to validate that each unit of the software performs as designed. A unit is the smallest testable part of any software. It usually has one or a few inputs and usually a single output. In procedural programming, a unit may be an individual program, function, procedure, etc. In object-oriented programming, the smallest unit is a method, which may belong to a base/ super class, abstract class or derived/ child class. (Some treat a module of an application as a unit.

Benefits of Unit Testing:

- Unit testing increases confidence in changing/ maintaining code. If good unit tests are written and if they are run every time any code is changed, we will be able to promptly catch any defects introduced due to the change.
- Codes are more reusable. In order to make unit testing possible, codes need to be modular. This means that codes are easier to reuse.

6.6. Integration testing

INTEGRATION TESTING is a level of software testing where individual units are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units. Test drivers and test stubs are used to assist in Integration Testing.

Testing performed to expose defects in the interfaces and in the interactions between integrated components or systems.

6.7. Performance testing

Performance testing is the process of determining the speed, responsiveness and stability of a computer, network, software program or device under a workload.

Performance testing can involve quantitative tests done in a lab, or occur in the production environment in limited scenarios. Typical parameters include processing speed, data transfer rate, network bandwidth and throughput, workload efficiency and reliability. For example, an organization can measure the response time of a program when a user requests an action or the number of millions of instructions per second (MIPS) at which a mainframe functions.

6.8. Stress Testing

Stress testing is a computer simulation technique used to test the resilience of institutions and investment portfolios against possible future financial situations. Such testing is customarily used by the financial industry to help gauge investment risk and the adequacy of assets, as well as to help evaluate internal processes and controls. In recent years, regulators have also required financial institutions to carry out stress tests to ensure their capital holdings and other assets are adequate.

Chapter 7

Summary, Conclusion and Future Enhancements

Chapter 7: Summary, Conclusion & Future Enhancements

7.1. Project Summary

We are living in an era of technology, and we used circumstances of latest tools and technique which they have used in current era and implement in our project. In University system some sort of things should be implemented as manually or sometime not intake action properly as well so the thing is that whichever we think to change the system or should be automate the systematically product which design on UI based or which they developed by good experience on user based. So, we have gathering all the information about implementation this system and sort of problem we have seen as much as possible of data gathering so, the kind of thing is better approach after data gathering to analyze them and test all phases which collected due to design of this project. After that we started of design of this project and all source of information which gathered to sort out and embed in our scheduling system.

Whenever we completed all the source of information to embed in system which we design then we planned to test every phase which we mentioned and after that to collaboratively implement by a specific platform to used by this system properly and beneficial for this by users.

This project will be very helpful to easy to understand and reliable for every user or quick system response of query based. Moreover, we have included in this system to enhance much better quality provided which user have takes sometime to used this and enjoyable product.

7.2. Achievements and Improvements

Scheduling System is near to complete the basic all modules of development with the help of Latest Technology “code igniter ”. In the start, we decide to choose the PHP based or simple android application but soon we decide to provide more obvious environment to enhance and latest technology will be added where they can enjoy with real and good environment.

Therefore, we decide to shift the project to code igniter with PHP environment instead of Simple PHP.

- Learn to work in a team
- Learned time management
- Code igniter Framework Understanding
- Working with a code igniter objects
- Creating an Environments
- Best Coding practices
- Serve Side scripting
- Object oriented coding
- UI designing
- Creative thinking

  We will try to improve and take care of our project. We try to more make it more responsive

7.3. Critical Review

"Scheduling System" is portal based system project that provide the ease to admin to adjust time table by online or evaluate the good responsive result shows. By using latest technology or environment with such kind of unique running and collect learning material idea, so it will take some time to get completely stable. As well as we did not work in code igniter, so we faced some troubles to understand some of functionalities.

7.4. Lessons Learnt

We absorb very much from this project. This project sharpens our skills in Schedulling System, designing tools and many management concepts as well as how to deal with a problem and how to stick for finding the solution of any problem until you fond. As well as technical skills, this project also enhance our personal development skills such as:

- Requirement Engineering
- Work Break down

- Learn to work in a team
- Learned time management
- Estimations
- Project analysis
- Use case designing
- Class diagram-designing
- Activity class designing
- Testing

7.5. Future Enhancements/Recommendations

In the future we have to planned we will deploy the project in Web Store for website development and Windows Store for windows and windows phone users and make it more attractive for every type of cross platform. We will add various environment in own project. Moreover, we will also add new objects and things; will be used to scheduling system.

Appendices

Information:

This chapter describes about the promotional material that we used for promotion of our project “COMPUTER BASED EXAMINATION SCHEDULER”.

Appendix A: User Manual

In the appendix section, we describe the different phases of user interface. Moreover, we describe our promotional plan and promotional materials like broacher, banner, standee and other marketing materials. We also describe other scenes and menus of our project.

Section 8.1: Main page

- User Update Details

Section 8.2: Settings

- Add semester
- Add school year
- Set term

Section 8.3: Maintenance

- Add Department
- Add Designation
- Add Program
- Add Rank
- Add Salutation
- Add School year
- Add Time

Section 8.4: Entry

- Add Class
- Add Room
- Add Subject
- Add Teacher

Section 8.5: Class Schedule

- Select time slots
- View as teacher
- View as class (student)
- View as room

Section 8.1: Main page

Update Account Details

Here, a user (Student, teacher, admin) can update his account details such like; name, username and password.

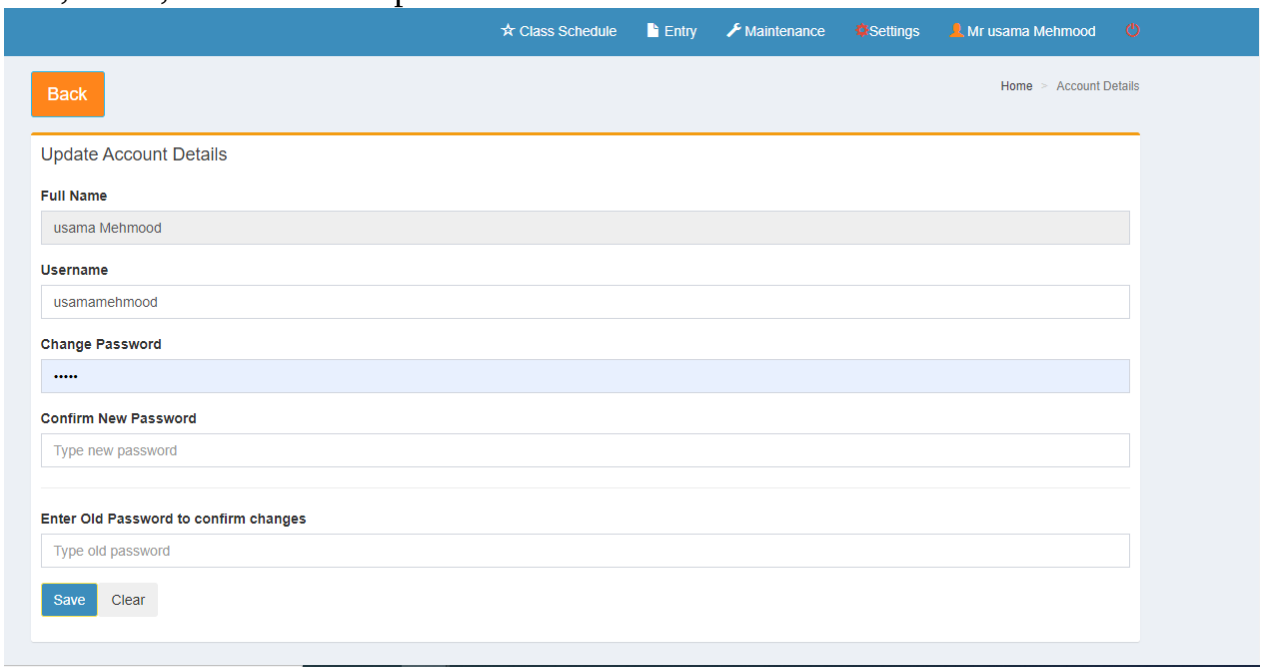


Figure 8.1.1

Section 8.2: Settings

In Setting you can add

- Semester
- School year
- Set term

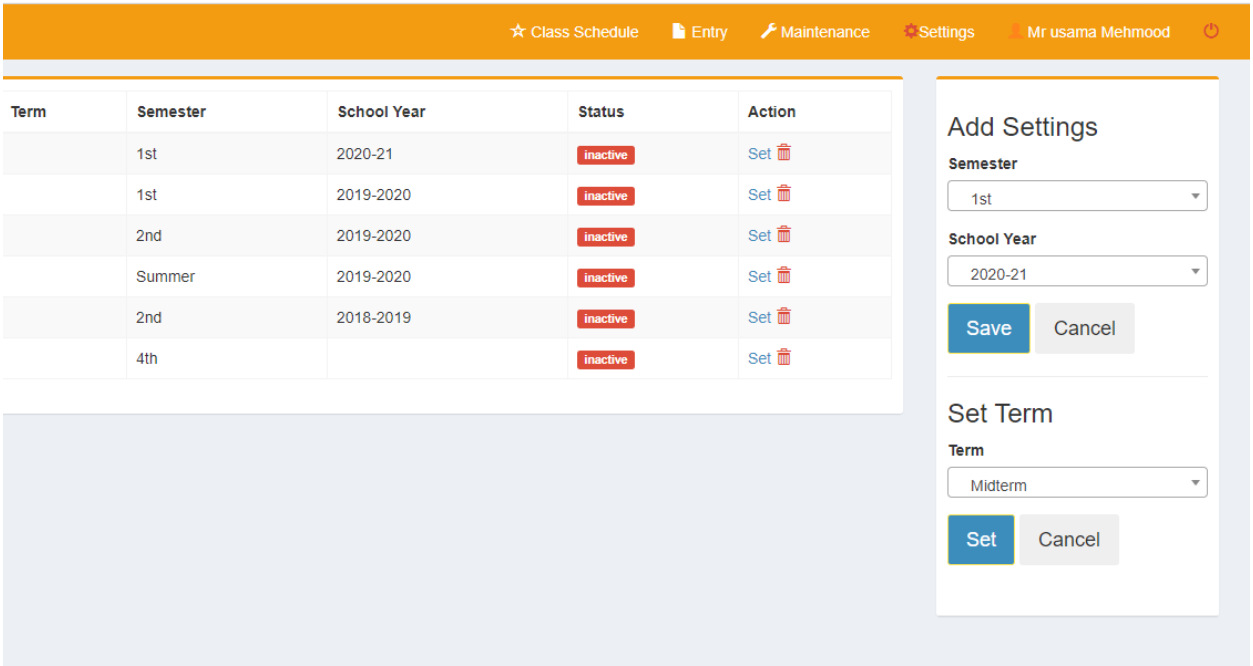


Figure 8.2.1

Setcion 8.3: Maintenance

Add Department

Here you can add and update department by adding dept. name and code.

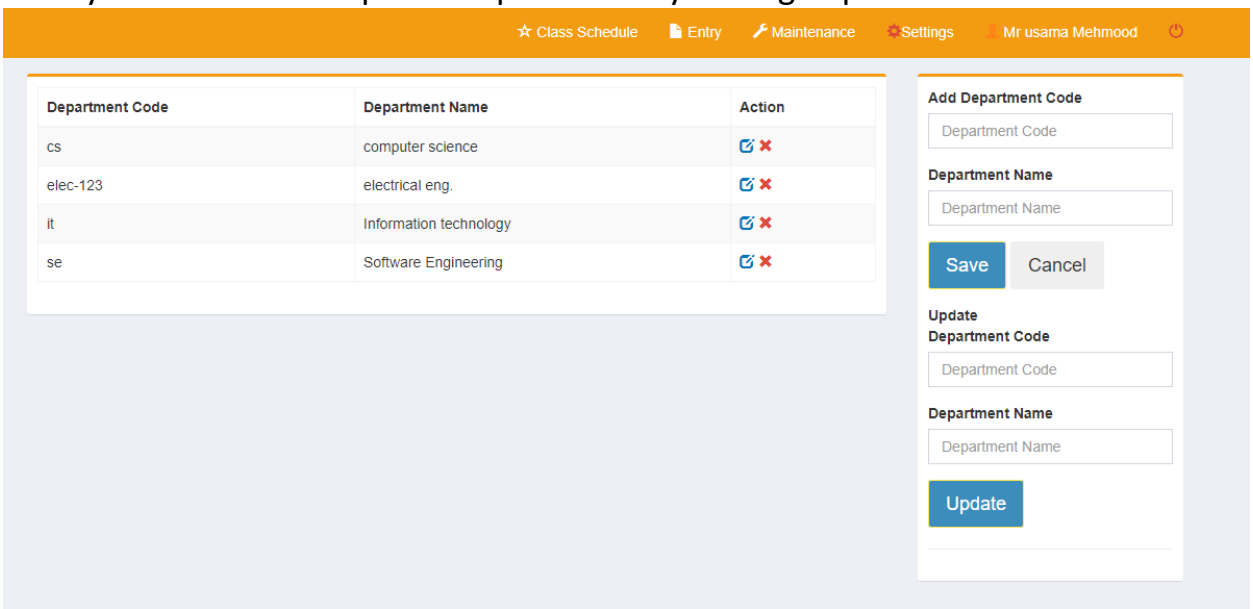


Figure 8.3.1

Add Designation

You can add/update designation for users

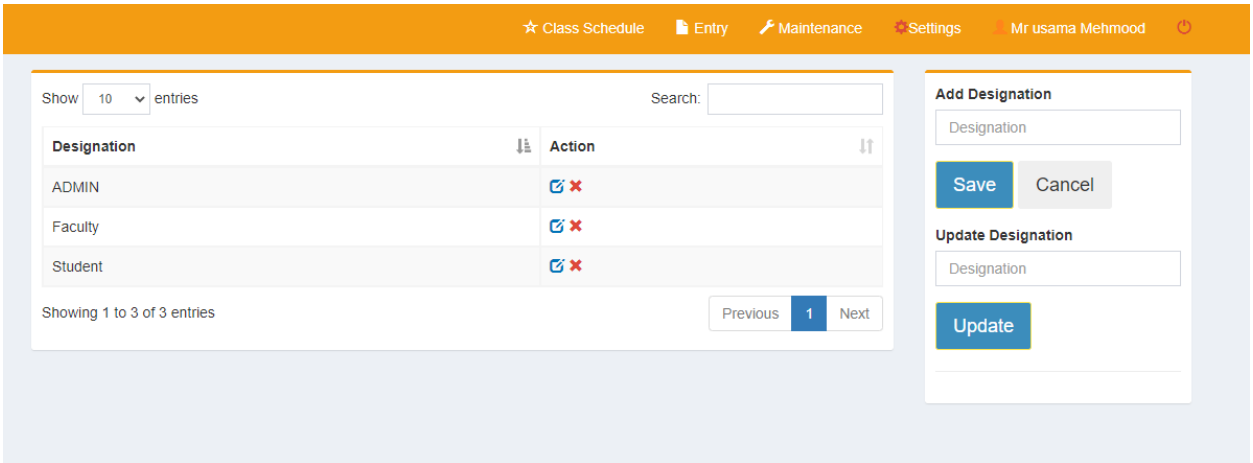


Figure 8.3.2

Add Program

In this section admin can add/update program title and code

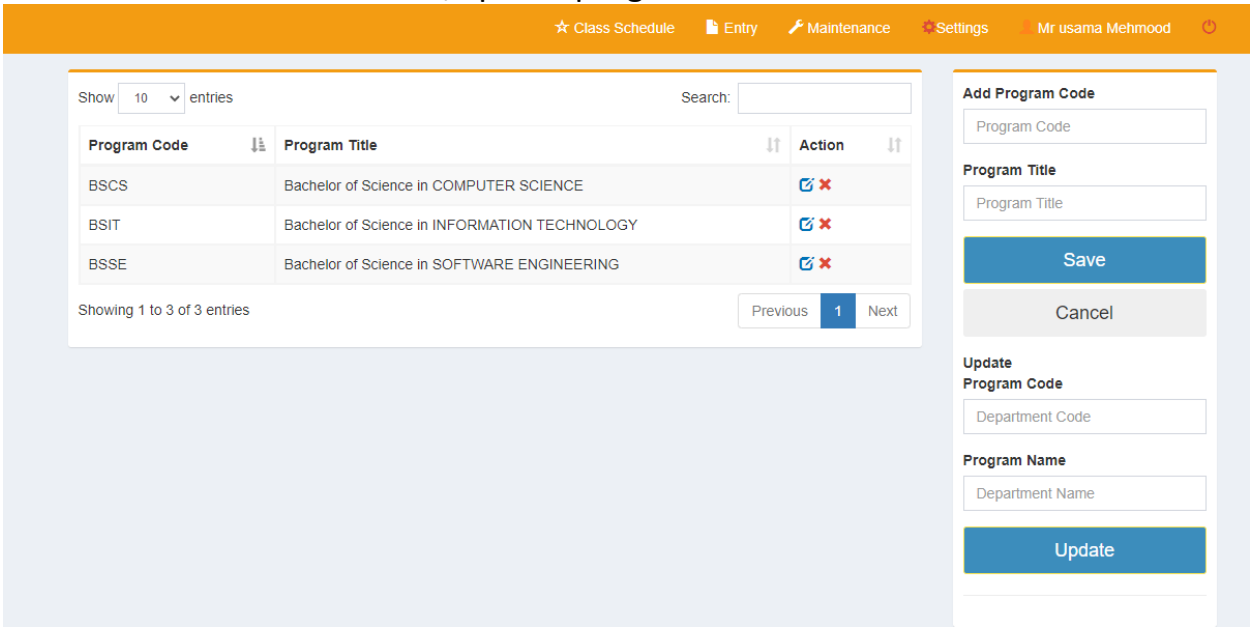


figure 8.3.3

Add Rank

here, admin can add/update rank for faculty teachers.

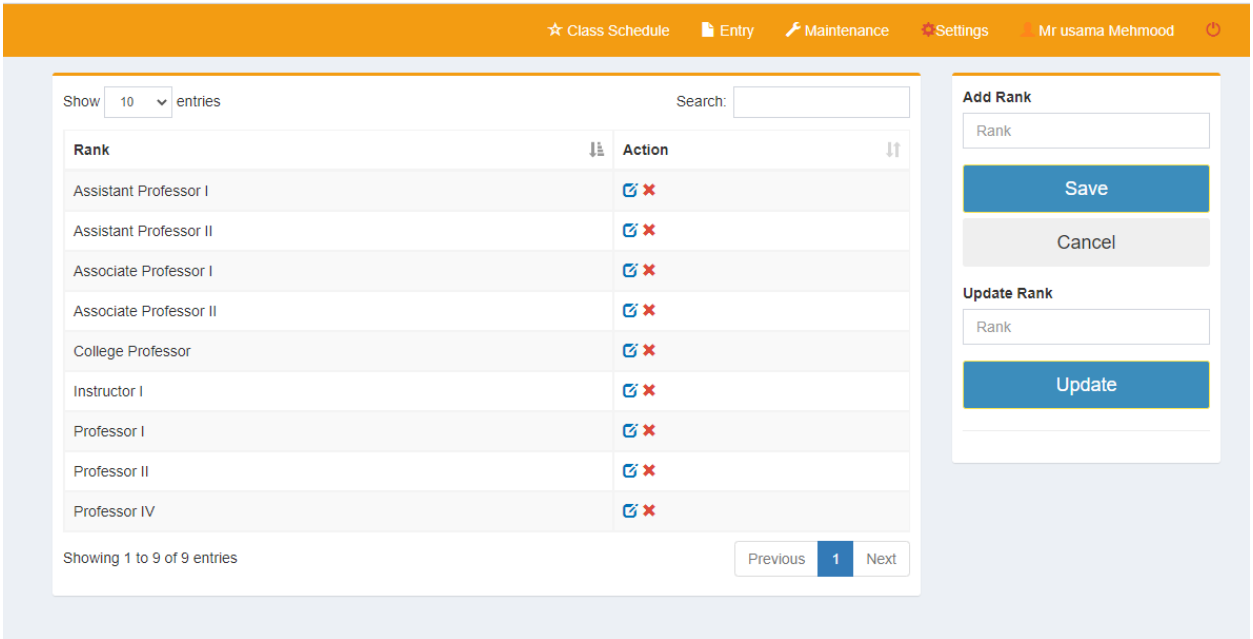


figure 8.3.4

Add Salutation

Here admin can add/update salutation for user like; Mr. Dr. etc.

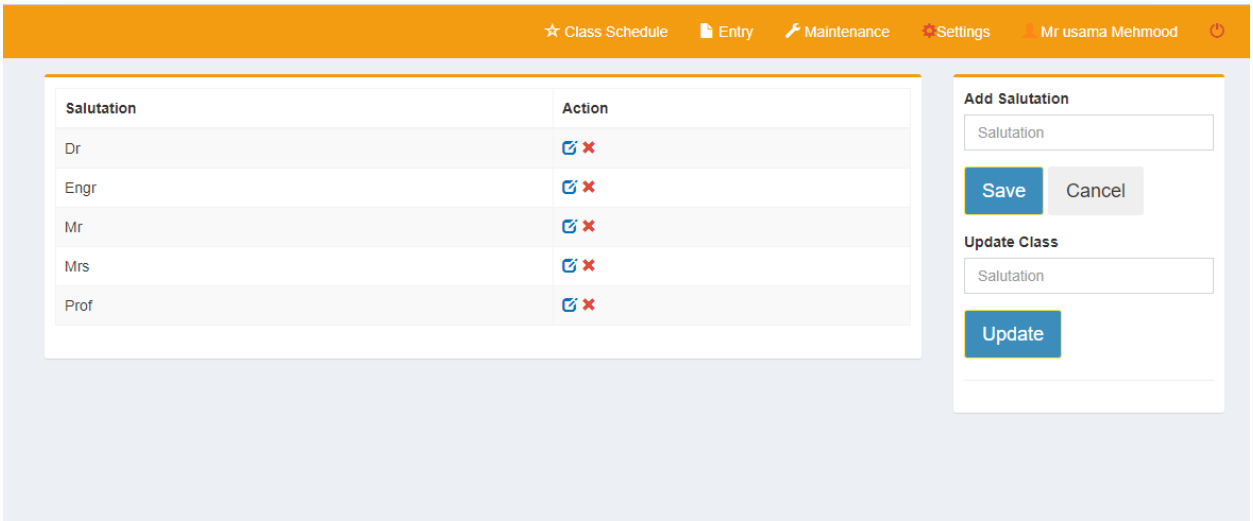


Figure 8.3.5

Add School year

Admin can add/delete school year for students

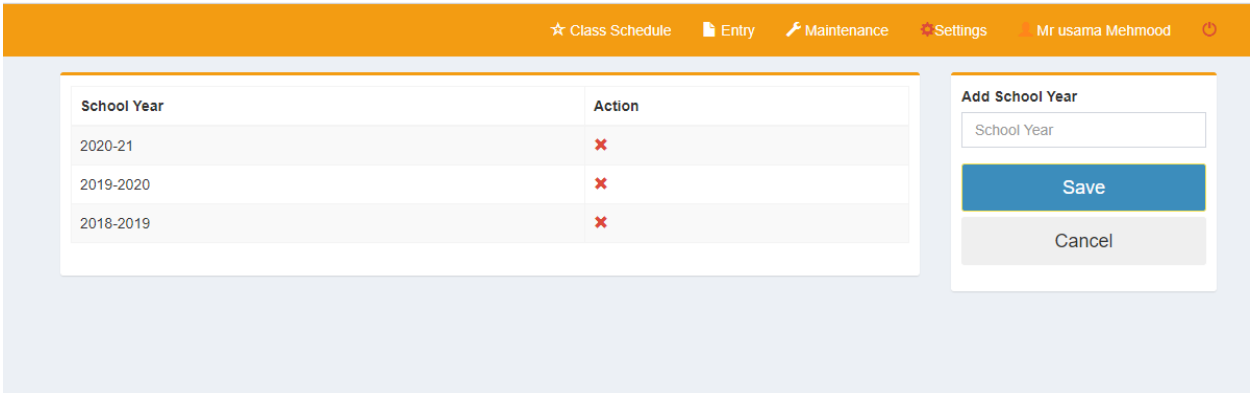


Figure 8.3.6

Add Time

Admin can add time slots for lectures

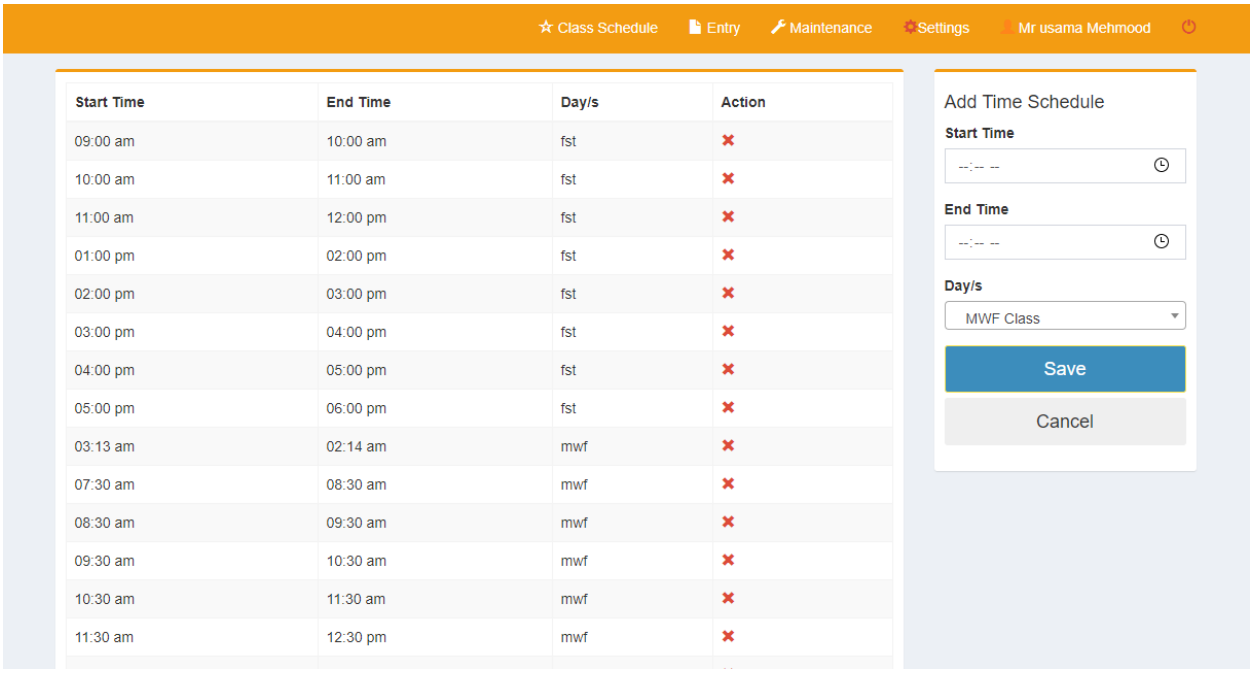


Figure 8.3.7

Section 8.4: Entry

Add Class

Here a class can be added and updated by admin.

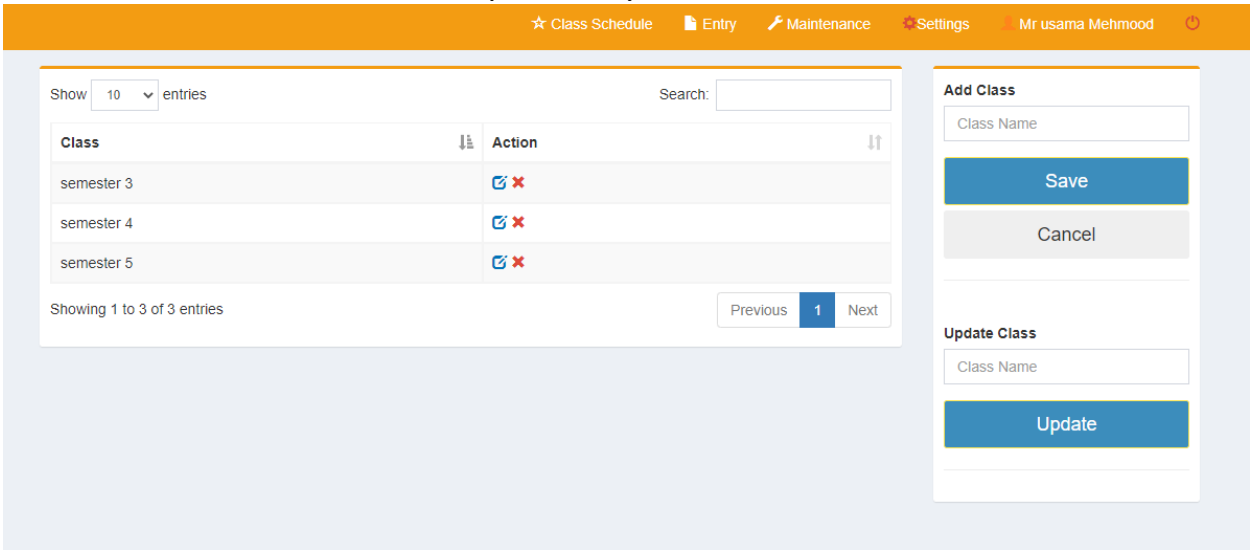


Figure 8.4.1

Add Room

A room can be add/update by the admin where the lecture has been taken by teacher.

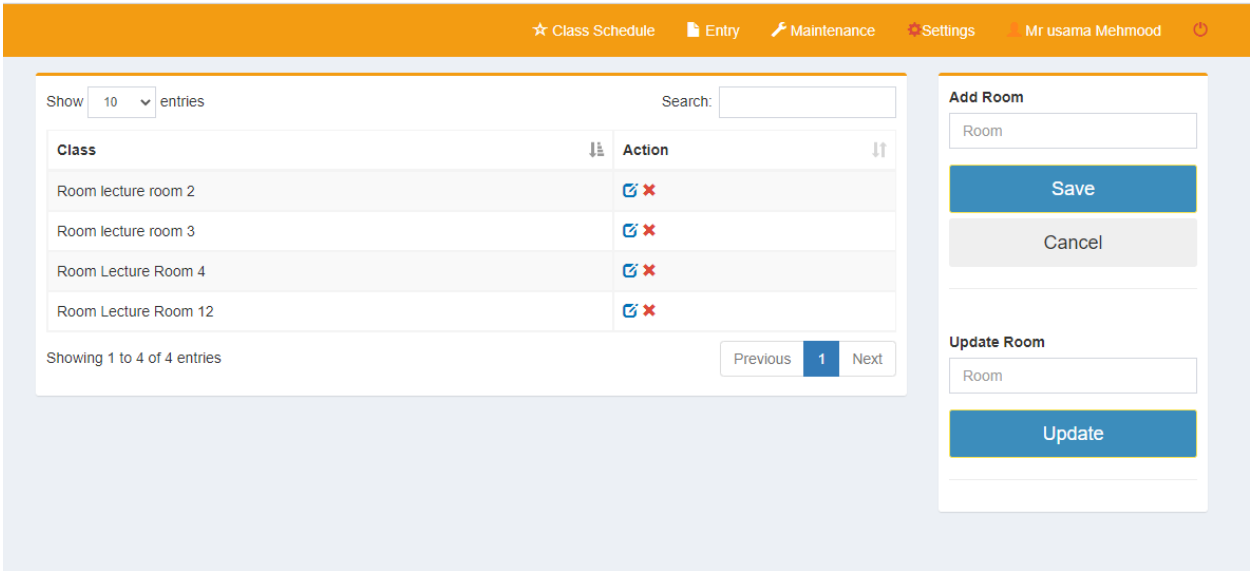


Figure 8. 4.2

Add Subject

Subject code and title can be updated and add by admin that offer by the institute.

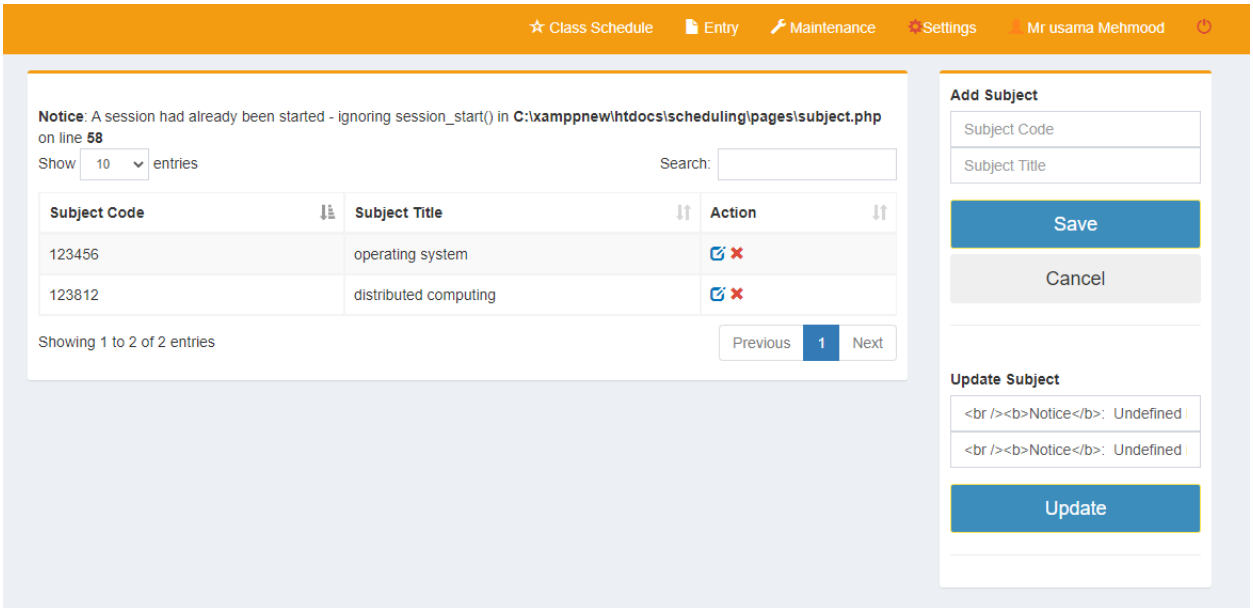


Figure 8. 4.3

Add Teacher

In this section a user can be added by the admin. Moreover he can view the user details that is added by him.

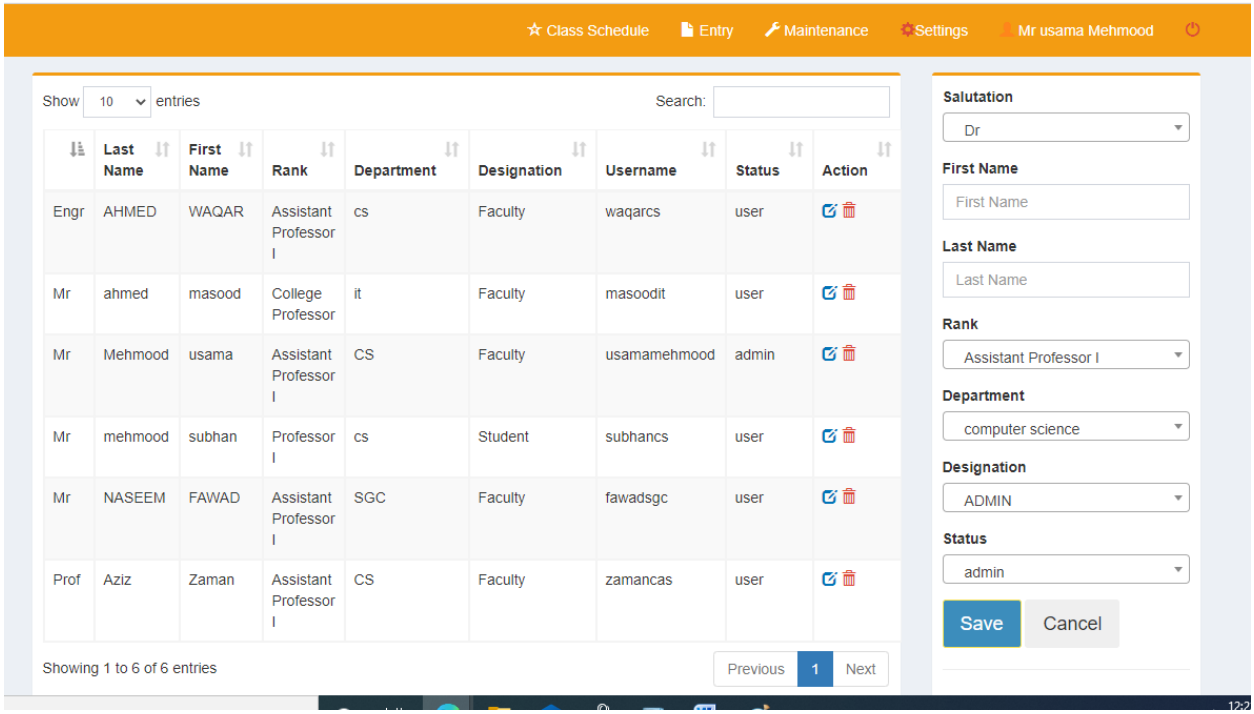


Figure 8.4.4

Section 8.5: Class Schedule

Select time slots

In this portion you select time slots for each class.

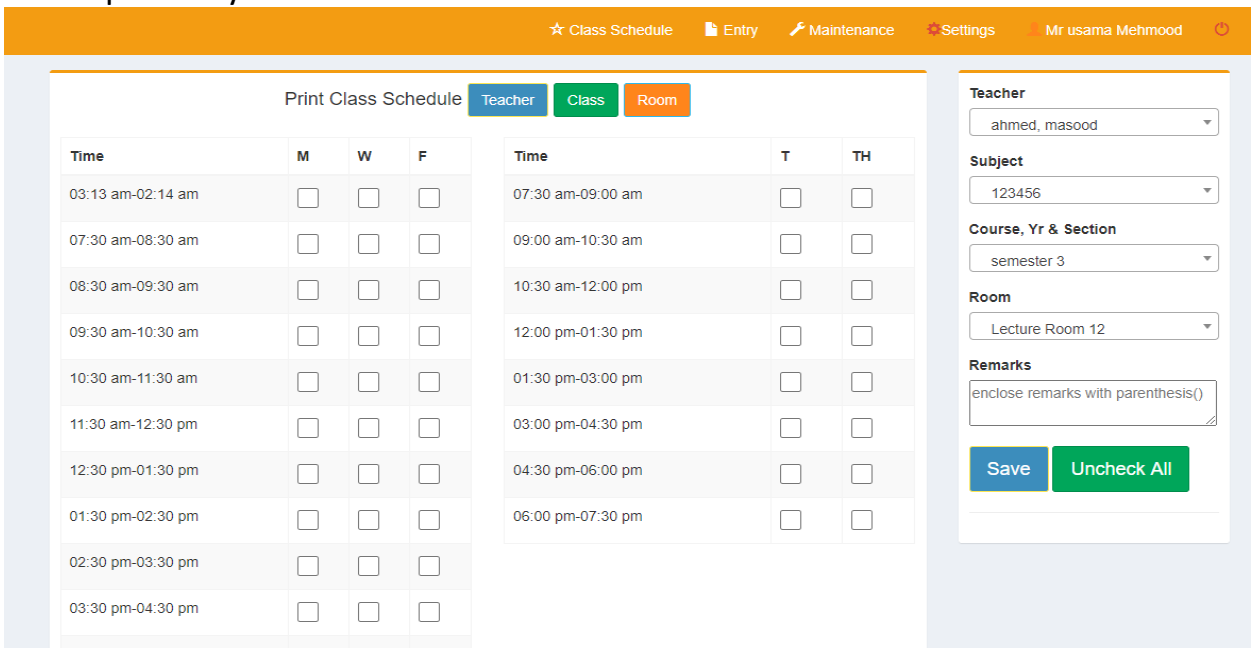


Figure 8.5.1

View as teacher

A teacher and admin can view his time scheduler

FACULTY SCHEDULE

Faculty: Engr WAQAR AHMED **School Year:** **Semester:**

Time	M	W	F	Time	T	TH
03:13 am-02:14 am				07:30 am-09:00 am	Edit 123456 Remove B Room lecture room 2	Edit 123456 Remove B Room lecture room 2
07:30 am-08:30 am	Edit 123456 Remove B Room lecture room 2	Edit 123456 Remove B Room lecture room 2	Edit 123456 Remove B Room lecture room 2	09:00 am-10:30 am		Edit 123456 Remove B Room lecture room 2
08:30 am-09:30 am	Edit 123456 Remove B Room lecture room 2		Edit 123456 Remove B Room lecture room 2	10:30 am-12:00 pm	Edit 123456 Remove B Room lecture room 2	
09:30 am-10:30 am				12:00 pm-01:30 pm		
10:30 am-11:30 am				01:30 pm-03:00 pm		
11:30 am-12:30 pm				03:00 pm-04:30 pm		
12:30 pm-01:30 pm				04:30 pm-06:00 pm		
01:30 pm-02:30 pm				06:00 pm-07:30 pm		

Figure 8.5.2

View as class (student)

Here, a student and admin can view his time scheduler.

CLASS SCHEDULE

Class: semester 3 **School Year:** **Semester:**

Time	M	W	F	Time	T	TH
03:13 am-02:14 am				07:30 am-09:00 am	Edit 123456 Remove Aziz, Zaman Room Lecture Room 12	
07:30 am-08:30 am		Edit 123456 Remove Aziz, Zaman Room Lecture Room 12		09:00 am-10:30 am	Edit 123456 Remove Aziz, Zaman Room Lecture Room 12	Edit 123456 Remove Aziz, Zaman Room Lecture Room 12
08:30 am-09:30 am				10:30 am-12:00 pm		Edit 123456 Remove Aziz, Zaman Room Lecture Room 12
09:30 am-10:30 am		Edit 123456 Remove Aziz, Zaman Room Lecture Room 12		12:00 pm-01:30 pm	Edit 123456 Remove Aziz, Zaman Room Lecture Room 12	
10:30 am-11:30 am	Edit 123456 Remove Aziz, Zaman Room Lecture Room 12			01:30 pm-03:00 pm		
11:30 am-12:30 pm		Edit 123456 Remove Aziz, Zaman Room Lecture Room 12		03:00 pm-04:30 pm		Edit 123456 Remove Aziz, Zaman Room Lecture Room 12
12:30 pm-01:30 pm				04:30 pm-06:00 pm	Edit 123456 Remove Aziz, Zaman Room Lecture Room 12	
01:30 pm-02:30 pm				06:00 pm-07:30 pm		

View as room

Room vise lecture can be view by admin.

ROOM SCHEDULE

Room: Lecture Room 12 **School Year:** **Semester:**

Time	M	W	F	Time	T	TH
03:13 am-02:14 am	Edit 123456 Remove A Aziz, Zaman			07:30 am-09:00 am	Edit 123456 Remove semester 3 Aziz, Zaman	
07:30 am-08:30 am		Edit 123456 Remove semester 3 Aziz, Zaman		09:00 am-10:30 am	Edit 123456 Remove semester 3 Aziz, Zaman	Edit 123456 Remove semester 3 Aziz, Zaman
08:30 am-09:30 am	Edit 123456 Remove 5th class ahmed, masood		Edit 123456 Remove 5th class ahmed, masood	10:30 am-12:00 pm		Edit 123456 Remove semester 3 Aziz, Zaman
09:30 am-10:30 am		Edit 123456 Remove semester 3 Aziz, Zaman		12:00 pm-01:30 pm	Edit 123456 Remove semester 3 Aziz, Zaman	
10:30 am-11:30 am	Edit 123456 Remove semester 3 Aziz, Zaman			01:30 pm-03:00 pm		
11:30 am-12:30 pm		Edit 123456 Remove semester 3 Aziz, Zaman		03:00 pm-04:30 pm		Edit 123456 Remove semester 3 Aziz, Zaman
12:30 pm-01:30 pm				04:30 pm-06:00 pm	Edit 123456 Remove semester 3 Aziz, Zaman	
01:30 pm-02:30 pm				06:00 pm-07:30 pm		

Figure 8.5.4

Appendix [B.]: Design and Implementation standard

This chapter contain the information of implementation methods and programming techniques that will be used for the in the project.

B.1. Development Method

According to the current scenario and requirement we have decided to use agile methodology. For the requirement in the project and to entertain that thing, we need to use “agile develop Methodology”.

Agile Development Cycle

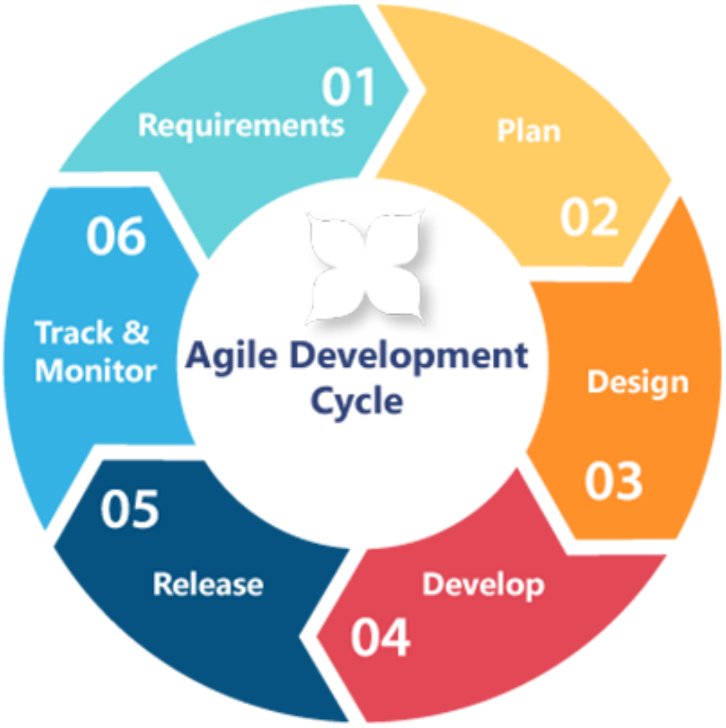


Figure 1

B.2. Programming Standards

During implementation phase, Developers will follow the best standard of programming. In best style of programming we use proper commenting, camel case naming.

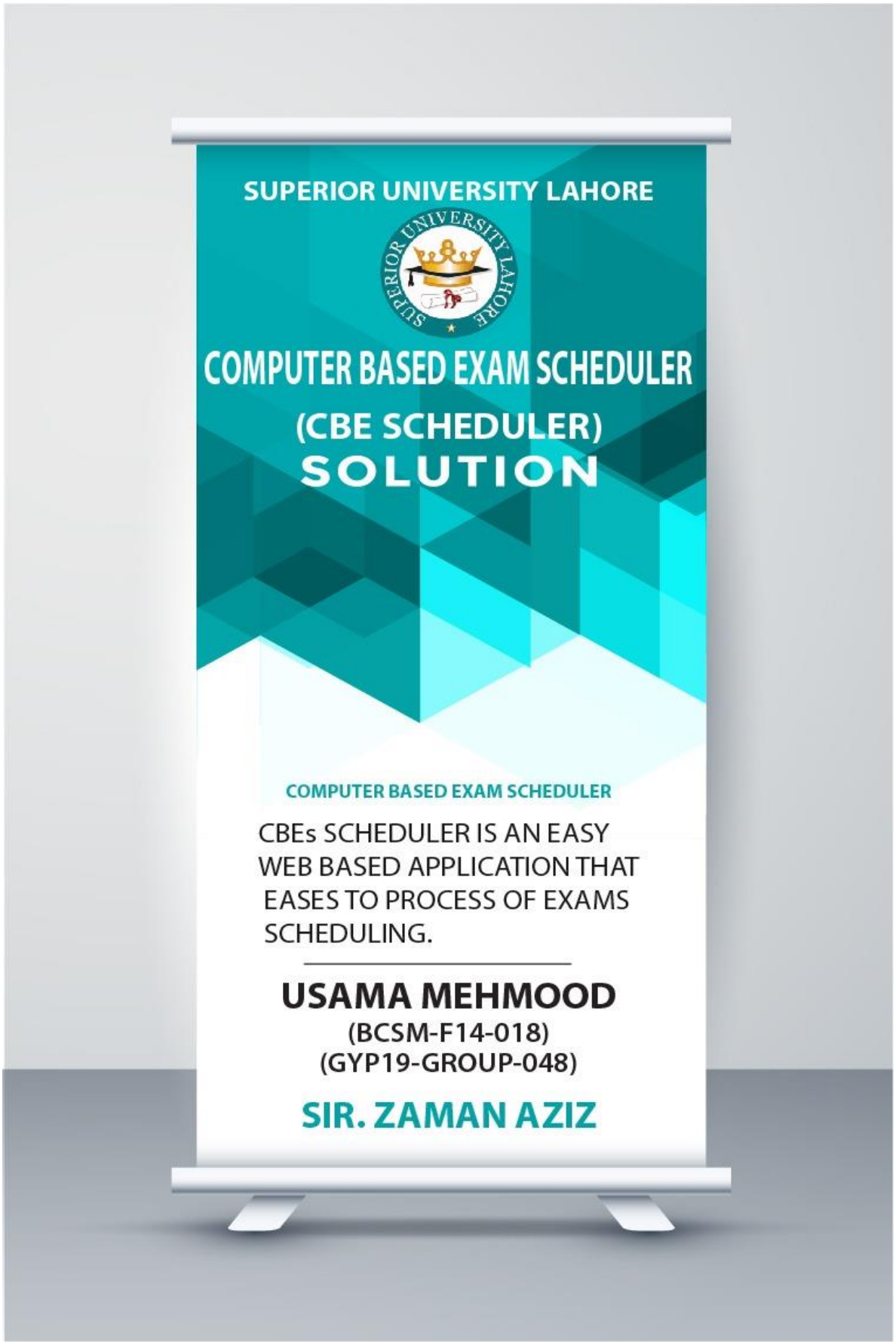
Appendix C: Information / Promotional Material

This chapter describes about the promotional material that we used for promotion of our project “CBE SCHEDULING”.

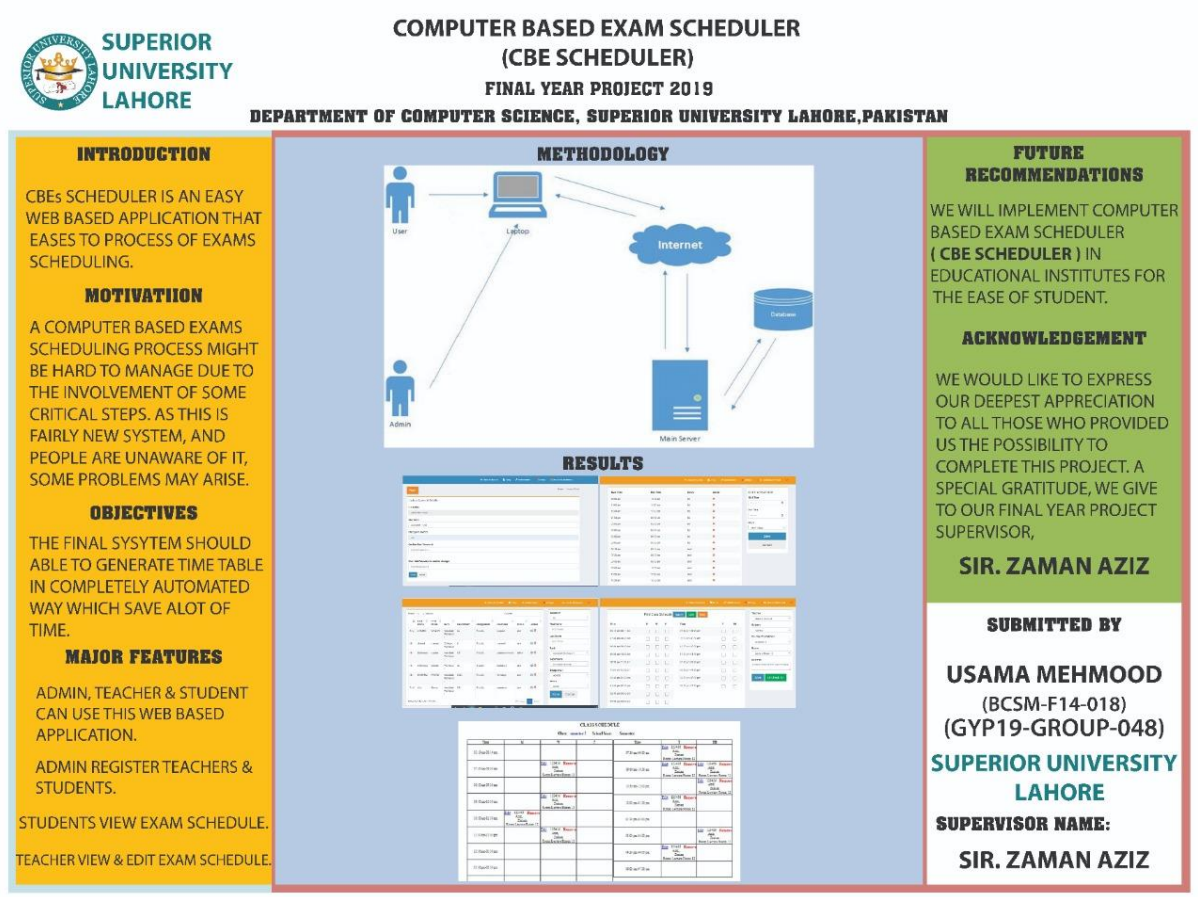
A.1. Broacher


COMPUTER BASED EXAM SCHEDULER
(CBE SCHEDULER)
EXAM SCHEDULER
CBEs SCHEDULER IS AN EASY
WEB BASED APPLICATION THAT
EASES TO PROCESS OF EXAMS
SCHEDULING.

A.2. Standee


SUPERIOR UNIVERSITY LAHORE
COMPUTER BASED EXAM SCHEDULER
(CBE SCHEDULER)
SOLUTION
COMPUTER BASED EXAM SCHEDULER
CBEs SCHEDULER IS AN EASY WEB BASED APPLICATION THAT EASES TO PROCESS OF EXAMS SCHEDULING.
USAMA MEHMOOD
(BCSM-F14-018)
(GYP19-GROUP-048)
SIR. ZAMAN AZIZ

A.3. Banner


SUPERIOR UNIVERSITY LAHORE
COMPUTER BASED EXAM SCHEDULER
(CBE SCHEDULER)
FINAL YEAR PROJECT 2019
DEPARTMENT OF COMPUTER SCIENCE, SUPERIOR UNIVERSITY LAHORE,PAKISTAN
INTRODUCTION
CBEs SCHEDULER IS AN EASY WEB BASED APPLICATION THAT EASES TO PROCESS OF EXAMS SCHEDULING.
MOTIVATIION
A COMPUTER BASED EXAMS SCHEDULING PROCESS MIGHT BE HARD TO MANAGE DUE TO THE INVOLVEMENT OF SOME CRITICAL STEPS. AS THIS IS FAIRLY NEW SYSTEM, AND PEOPLE ARE UNAWARE OF IT, SOME PROBLEMS MAY ARISE.
OBJECTIVES
THE FINAL SYSYTEM SHOULD ABLE TO GENERATE TIME TABLE IN COMPLETELY AUTOMATED WAY WHICH SAVE ALOT OF TIME.
MAJOR FEATURES
ADMIN, TEACHER & STUDENT CAN USE THIS WEB BASED APPLICATION.
ADMIN REGISTER TEACHERS & STUDENTS.
STUDENTS VIEW EXAM SCHEDULE.
TEACHER VIEW & EDIT EXAM SCHEDULE.
METHODOLOGY
User
Laptop
Internet
Database
Admin
Main Server
RESULTS
FUTURE RECOMMENDATIONS
WE WILL IMPLEMENT COMPUTER BASED EXAM SCHEDULER (CBE SCHEDULER) IN EDUCATIONAL INSTITUTES FOR THE EASE OF STUDENT.
ACKNOWLEDGEMENT
WE WOULD LIKE TO EXPRESS OUR DEEPEST APPRECIATION TO ALL THOSE WHO PROVIDED US THE POSSIBILITY TO COMPLETE THIS PROJECT. A SPECIAL GRATITUDE, WE GIVE TO OUR FINAL YEAR PROJECT SUPERVISOR,
SIR. ZAMAN AZIZ
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