SocioPUCIT

Team ID: BCSF10- 07

Session: BS Computer Science Fall 2010-2014

Project Advisor: Muhammad Adeel Nisar

Submitted By

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Punjab University College of Information Technology
University of the Punjab, Lahore

STATEMENT OF SUBMISSION

This is to certify that **Amna Kazmi** Roll No. **BCSF10M030**, **Muhammad Zeeshan Arshad** Roll No. **BCSF10M040, Saniya Tauqir** Roll No. **BCSF10M055** and **Muawiya Rahman** Roll No. **BCSF10M056** have successfully completed the final project named as: **SocioPUCIT**, at the Punjab University College of Information Technology, University of The Punjab, Lahore, to fulfill the partial requirement of the degree of **Bachelor in Computer Science**.

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Mr Ejaz Ashraf
Assistant Professor
PUCIT, Lahore

_____

Project Primary Advisor
Muhammad Adeel Nisar
Assistant Professor at PUCIT

_____

Project Examiner
Muhammad Adeel Nisar
Assistant Professor at PUCIT

Proofreading Certificate

It is to certify that I have read the document meticulously and circumspectly. I am convinced that the resultant project does not contain any spelling, punctuation or grammatical mistakes as such. All in all I find this document well organized and I am in no doubt that its objectives have been successfully met.

_____

Madam Samreen Shahid
Business Communication and Technical Writing,
Lecturer, PUCIT

Acknowledgement

We truly acknowledge the cooperation and help make by Name of **Muhammad Adeel Nisar, Assistant Professor** of **Punjab University College of Information Technology Lahore.** He has been a constant source of guidance throughout the course of this project. We are also thankful to our friends and families whose silent support led us to complete our project.

1- Dr. Mansoor Sarwar

2- Mr. Ejaz Ashraf

3- Madam Mehvish Kiyani

Date:

June 24, 2014

Abstract

This project [Socio PUCIT] will be facilitating the teacher-student coordination. This system will also be helping teachers for effective grade management and quiz conduction as quizzes will be generated randomly and checked automatically. Coordination functions will be provided ease; user can create/access and broadcast certain events like exams date-sheet etc. Teacher, Societies and Exam Branch can send notifications for the student and teacher events.

Our application provides teachers-students with the facility of communication and sending information from device to device as well as user friendly environment.
As there would be many students accessing the application at one time so important factor would be request handling doing load balancing in order to keep application responsive.

The primary role of this application would be to create a user friendly environment between the faculty and the students. It would be type of a social network for PUCIT having many other side features thus, fulfilling the essential requirements of entities in effective and secure manner.
Success will also attract other major Universities to engage us for developing similar application for them.

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This project [Socio PUCIT] will be facilitating the teacher-student coordination. This system will also be helping teachers for effective grade management and quiz conduction as quizzes will be generated randomly and checked automatically. The goal of the project is to provide an innovative solution to students and teachers coordination, effective grade management of students and ease for quiz checking and announcement notifications.

1.1 Project Title

"SOCIO PUCIT"

1.2 Project Overview Statement

In the time since 2000 PUCIT has been facilitating the field of Information Technology by providing competent young professionals. We will be developing a project that will lead to huge increment in the communication and learning process by providing a handy system for students, teachers and university. This is a development project related to web and Mobile Computing aimed to facilitate all the Major Entities involved in the University. Providing a better, quick and responsive communication system for student, teachers program coordinator and societies.

Project Overview Statement:

Project Title: "Socio PUCIT"

Group Leader: Muhammad Zeeshan Arshad

Project Members:

Name	Email Address	Signature
Amna Kazmi	Bcsf10m030@pucit.edu.pk	
Saniya Tauqir	Bcsf10m055@pucit.edu.pk	
Muhammad Zeeshan Arshad	Bcsf10m040@pucit.edu.pk	
Muawiya Rahman	Bcsf10m056@pucit.edu.pk	

Project Goal:
Providing ease to both Students and Teachers regarding Academic and Campus activities.

Objectives:

Sr.#	
1	Providing a better, quick and responsive communication system for student, teachers and societies.
2	Automatic quiz checking (Multiple choice questions) and grade updating.
3	Automatic quiz generation and conduction.
4	Assignment announcement, submission and checking,
5	Examination Sitting arrangement notifications.
6	Notification of university announcements, class announcements and events announcements by system to targeted audience.
7	Make an easy-to-use application.
8	Make a user friendly interface.
9	Showing grade book to both teacher-student.
10	Showing midterm and final term exam results.

Project Success criteria:

- Project meets all the objectives and goal is achieved up to satisfaction level of end-user.
- Software is error free and easy to understand.
- Campus and academic activities become easy for all the major entities involved in university.

Assumptions, Risks and Obstacles:

Requirements elicitation.

Organization Address (if any): PUCIT - Allama Iqbal Campus (old-Campus), University of the Punjab

Type of project: ❑Research ❑Development (tick)

Target End users: Teachers, Students, Societies Custom users, Principal

Development Technology: ❑Object Oriented (tick) ❑Structured

Platform: ❑Web based ❑Distributed
❑Desktop based ❑Setup Configurations
❑Other__Mobile and Web Based____ (tick)

Suggested Project Supervisor: Mr Adeel Nisar

Approved By: Project office PUCIT

Date: June 24,2014

Chapter No. 1

1. Introduction

This project [Socio PUCIT] will be facilitating the teacher-student coordination. This system will also be helping teachers for effective grade management and quiz conduction as quizzes will be generated randomly and checked automatically. Coordination functions will be provided ease; user can create/access and broadcast certain events like exams date-sheet etc. Teacher, Societies and Exam Branch can send notifications for the student and teacher events.

a. Project Feasibility
b. Project Scope
c. Project Costing
d. Critical Path Method Analysis (CPM Analysis)
e. Gantt Chart
f. Introduction to team members
g. Tools and Technologies
h. Vision Document
i. Risk List

1.1 Project/Product Feasibility Report

This topic determines the feasibility of project "**SocioPucit".** It is basically used as a measure of how practical or beneficial the development of a software system will be to the developers and the customers. Following is the detailed feasibility report.

- Technical
- Operational
- Economic
- Schedule
- Specification
- Information
- Motivational
- Legal and Ethical

1.1.1 Technical Feasibility

This is concerned with specifying equipment and software that will successfully satisfy to build our application. Our group has appropriate skills so we can develop our project. There is need of programming skills to develop this project and we have skills so we hopefully can make this. We have evaluated ourselves that the whole team has skills to do project on modern tools and technologies.

1.1.2 Operational Feasibility

Our application provides teachers-students with the facility of communication and sending information from device to device as well as user friendly environment.
As there would be many students accessing the application at one time so important factor would be request handling doing load balancing in order to keep application responsive.

Evaluation of technical ability of the staff to operate the project is the main aim of operational feasibility. In this area the question arises as to whether the problem is worth solving and if the solution provided for the problem works or not. How do end users and managers feel about the problem or solution is another query to be answered.

1.1.3 Economic Feasibility

"SocioPucit" development cost is one-time cost that will not demand further cost after the project has been completed, it will demand if we want to expand our project and it's all depends on usage of our application. The project is economically feasible as it only requires a mobile phone (version 4.0 only) with android operating system. The application is reusable and is user friendly.

Cost Estimate:

Development or Acquisition Costs

- Database
- Interfaces

Operational Costs

- Support of Database, Hardware, Software.
- Services provided to the customer such as transferring of files etc.

Benefit Estimates:

Tangible Benefits

- Application can satisfy the user needs and does not waste any of the system resources.

Intangible Benefits

- Providing users with the support to transfer information or get access to the information according to one's need with the maintenance of the security.

1.1.4 Schedule Feasibility

Time is an important factor. Time evaluation is the most important consideration in the development of project. The time schedule is required to develop this project is successfully. The total time to complete the project is roughly 6 months. We have divided our project into segment and tasks are given to each member of the group and they are accountable to complete the task before Dead line. The connectivity of different modules is scheduled so project is also feasible with respect to schedule.

1.1.5 Specification Feasibility

Required specification of hardware and software for the completion of this project are feasible. Following are the requirements.

Software Requirements:-

- Linux Operating System – Any flavor (for server deployment).
- Android SDK (Latest)
- Operating System: Windows 7 (x86/x64) or above.

Hardware Requirements:-

- Processor: Intel Core 2 Duo or greater or AMD 2.0 GHz and greater.
- RAM: 4GB or more.
- Android Smart phone.
- System Type: 32/64-Bit Operating System, x64/x86 processor architecture.

1.1.6 Information Feasibility

The goal of the project is to provide an innovative solution to students and teachers coordination, effective grade management of students and ease for quiz checking and announcement notifications.

The feasibility of information must be assessed regarding its completion, reliability, and meaningfulness.

1.1.7 Motivational Feasibility

There are many motivational factors for developing this project. As this project main goal is to provide a better, quick and responsive communication system for student, teachers program coordinator and societies. Following are the motivational factors

- This project will provide students with the facility to contact with their teachers through their cell-phones using application, resulting in better response time.
- There would be different discussion forums for students their queries would be handled quickly as teachers and other forums members will get notified on their phone resulting in increasing the learning curve of students.
- As it's a kind of a social network with many side features one important feature is automatic quiz generation, their submission, automatic checking and grade update. This feature is very attractive for teachers as the amount of work load decreases.
- Teachers would be given a special panel to make announcements regarding class makeup's etc.
- Different societies can make announcements through application. Announcements shall be regulated to all users on their cell phones.
- It will be user-friendly, quick to learn and reliable

As there exists no current application for PUCIT so these factors are motivation for us.

1.1.8 Legal & Ethical Feasibility

This project supports legally and ethically to all end users we provide our disclaimer and our privacy policy to customer. This warranty gives you specific legal rights and you may also have other legal rights that vary from state to state.

1.2 Project/Product Scope

The boundary that surrounds our project generally clarifies its scope. Requirements require solution and our project provides it with proper description of each aspect. The requirements of major entities involved in each university are almost similar. For the specifically defined entities like in our project, which are majorly students and concerned with students the requirements of teachers, different societies and exam branch.

The primarily scope of the project includes that we have to develop an application that provides an effective coordination system for teacher-student. Each of the modules is assigned and developed by group members. We prioritize the work flow of our project development. First we will emphasis the foundation of our project that is designing a portal for coordination of student's teachers and other entities. Second, the automatic quiz generation, automatic quiz/assignment checking, submission and grade management.

Third, exam branch components will be developed. At fourth priority level societies components will be developed and each of these components that have built before or in process will be designed as they relates with other components.

1.3 Project/Product Costing

A metric is some measurement we can make of a product or process in the overall development process. Metrics are split into two broad categories:

- Knowledge oriented metrics: these are oriented to tracking the process to evaluate, predict or monitor some part of the process.
- Achievement oriented metrics: these are often oriented to measuring some product aspect, often related to some overall measure of quality of the product.

Most of the work in the cost estimation field has focused on algorithmic cost modeling. In this process costs are analyzed using mathematical formulas linking costs or inputs with metrics to produce an estimated output. The formulae used in a formal model arise from the analysis of historical data. The accuracy of the model can be improved by calibrating the model to your specific development environment, which basically involves adjusting the weightings of the metrics.

1.3.1 Project Cost Estimation By Function Point Analysis

Function Point Analysis:

Type of Content	Complexity of Components			
	Low	Average	High	Total
External Input	2X3 = 6	2X4 = 12	5X6 = 30	48
External Outputs	5X4 = 20	6X5 = 30	5X7 = 35	85
External Inquires	4X3 = 12	3X4 = 12	2X6 = 12	36
Internal Logical Files	2X7 = 14	1X10 = 10	4X15 = 60	84
External Interface Files	0X5 = 0	0X7 = 0	0X10 = 0	0

Type of Content	
Complexity of Components	Low
External Input	2X3 = 6

Value adjustment factor
(VAF) is based on 14 general system characteristics (GSC's) that rate the general functionality of our application being counted. The degrees of influence range on a scale of zero to five, from no influence to strong influence.

0 ---------- very low
1 ---------- Low
2 ---------- Average
3 ---------- High
4 ---------- Very high

Sr#.	Characteristics	Complexity
1.	Data communications	4
2.	Distributed data processing	3
3.	Performance	5
4.	Heavily used configuration	3
5.	Transaction rate	4
6.	On-Line data entry	2
7.	End-user efficiency	4
8.	On-Line update	3
9.	Complex processing	3
10.	Reusability	4
11.	Installation ease	4
12.	Operational ease	2
13.	Multiple sites	1
14.	Facilitate change	4

Value Adjustment factor:-
The calculated Value adjustment factor (fi) for our System is **46.**

Function point estimated:-

FP est. = Count Total * [0.65 + 0.01 * (Fi)]
FP est. = 232 * [0.65 + 0.01 * (46)]
FP est. = 280.83

Cost per Function Point:-

(Cost = financial investment)
Cost / FP = labor rate / productivity parameter
Labor rate = 15000 Rupees/month
Productivity parameter = 35FP/ month PM
Cost/FP = 15000/35
Cost/FP = 428.571

Total Project Cost:-

Regarding finance:-
Total Project Cost = FP est. * (cost / FP)
Total Project Cost = 280.83 * (428.571)
Total Project Cost = 120355.59 RS

Total Estimated Effort:-

Total Estimated Effort = 280.83 / 35 (keeping productivity parameter = 14hours per fp)

Total Estimated Effort = 8 Person Month

1.4 CPM - Critical Path Method

1. Specify the Individual Activities

Following is the list of all the activities in the project.

Activity ID	Activity Description
A	Writing Project Proposal
B	Creating Vision document and Risk List
C	System Level Requirements Analysis
D	Writing Project Feasibility Report
E	Project Cost Estimation
F	Project Scheduling (CPM, Gantt chart)
G	Writing System Specifications
H	Identifying External Entities
I	Creating Context Level DFD
J	Capturing “shall” statements
K	Allocating requirements

L	Prioritizing Requirements
M	Creating Requirements Traceability Matrix
N	Creating high level use case diagram
O	Writing use case
P	Creating domain model
Q	Creating sequence diagram
R	Creating collaboration diagram
S	Writing operation contracts
T	Design class diagram
U	Data modeling (ERD)
V	Developing basic backend database
W	Implementing User-Registration & Login
X	User-management
Y	User-Profile building
Z	Implementing User-Home-page
A1	Implementation of file-Uploading
A2	Implementation of Automatic Quiz generation, checking and assignment checking
A3	Grade Management

A4	Announcements Handling
A5	Implementation Discussion Forum
A6	Attendance Management
A7	Attendance Editing
A8	Implementing Notification Process
A9	Implementing System Logs
B1	Granting Access Privileges
B2	Up-grading backend database
B3	Complete Server side Integration
B4	Complete Client side Integration
B5	Final Testing
B6	Deployment

2. Determine the Sequence of the Activities

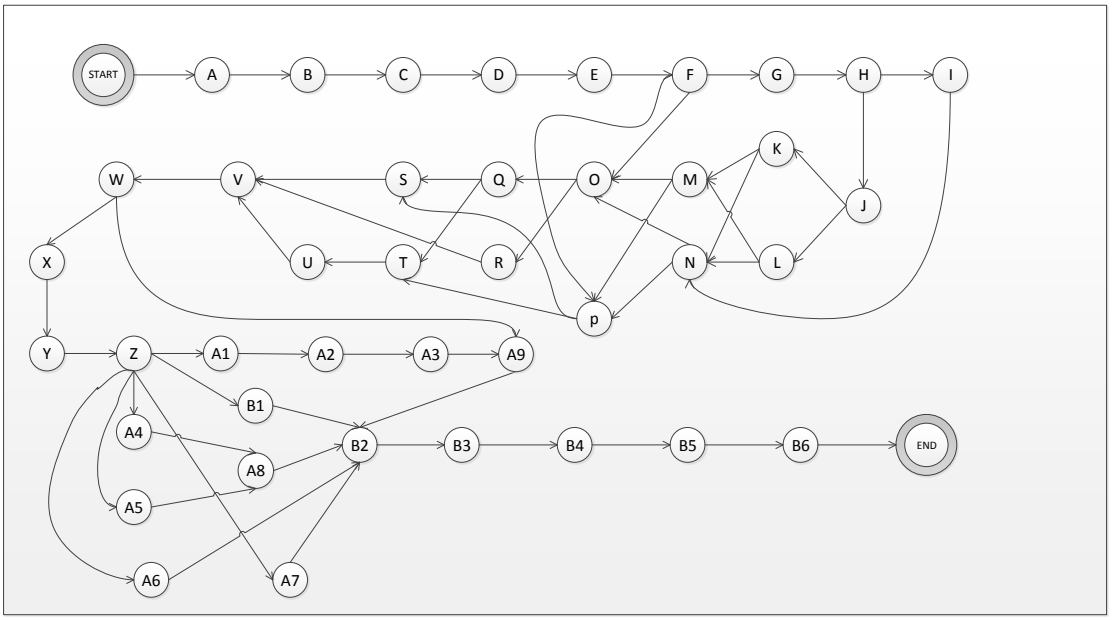
Following is the sequence of activities, listed down with respective predecessors.

Activity ID	Immediate Predecessor	Duration
A	None	7
B	A	1
C	B	1
D	C	1
E	D	1
F	E	2

G	D	1
H	G	1
I	H	1
J	H	2
K	J	1
L	J	1
M	K,L	1
N	I,K,L	2
O	F,M,N	5
P	F,M,N	3
Q	O	2
R	O	2
S	P,Q	3
T	P,Q	2
U	T	2
V	R,S,U	2
W	V	2
X	W	2
Y	X	2
Z	Y	2
A1	Y	1
A2	A1	3
A3	A2	5
A4	Z	10

A5	Z	4
A6	Z	6
A7	Z	5
A8	A4,A5	9
A9	W,A3	6
B1	Z	8
B2	A6,A7,A8,A9,B1	10
B3	B2	25
B4	B3	20
B5	B4	7
B6	B5	8

3. Draw the Network Diagram



4. Estimate Activity Completion Time

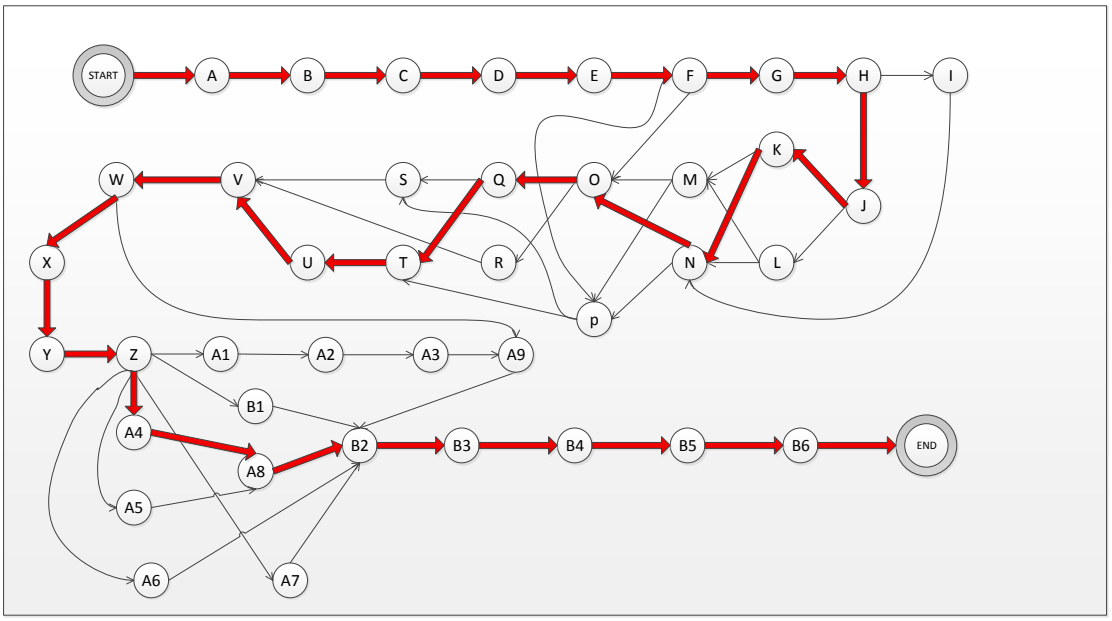
Done (in previous table)

5. Identify the Critical Path

Activity	Duration	ES	EF	LF	LS	TS	FS
START	0	0	0	0	0		0
A	7	0	7	7	0		0
B	1	7	8	8	7		0
C	1	8	9	9	8		0
D	1	9	10	10	9		0
E	1	10	11	11	10		0
F	2	11	13	13	11		0
G	1	13	14	14	13		0
H	1	14	15	15	14		0
I	1	15	16	18	17		2
J	2	15	17	17	15		0
K	1	17	18	18	17		0
L	1	17	18	18	17		0
M	1	18	19	20	19		1
N	2	18	20	20	18		0
O	5	20	25	25	20		0
P	3	20	23	27	24		4
Q	2	25	27	27	25		0
R	2	25	27	31	29		4

S	3	27	30	31	28		1
T	2	27	29	29	27		0
U	2	29	31	31	29		0
V	2	31	33	33	31		0
W	2	33	35	35	33		0
X	2	35	37	37	35		0
Y	2	37	39	39	37		0
Z	2	39	41	41	39		0
A1	1	41	42	46	45		4
A2	3	42	45	49	46		4
A3	5	45	50	54	49		4
A4	10	41	51	51	41		0
A5	4	41	45	51	47		6
A6	6	41	47	60	54		13
A7	5	41	46	60	55		14
A8	9	51	60	60	51		0
A9	6	45	51	60	54		9
B1	8	41	49	60	52		11
B2	10	60	70	70	60		0
B3	25	70	95	95	70		0
B4	20	95	115	115	95		0
B5	7	115	122	122	115		0
B6	8	122	130	130	122		0
END	0	130	130	130	130		0

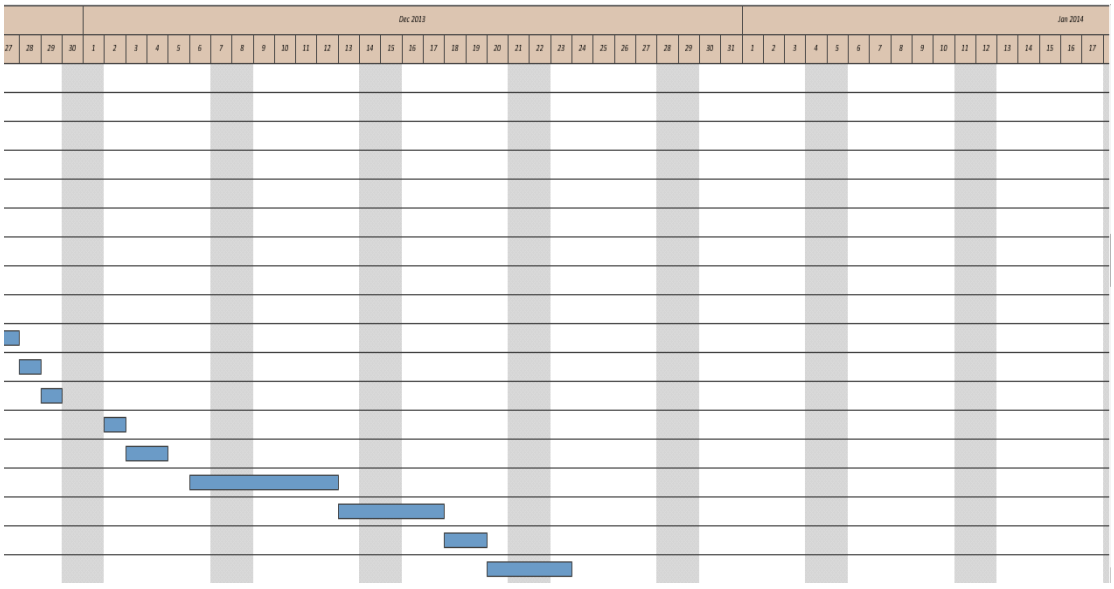
6. Updated CPM diagram



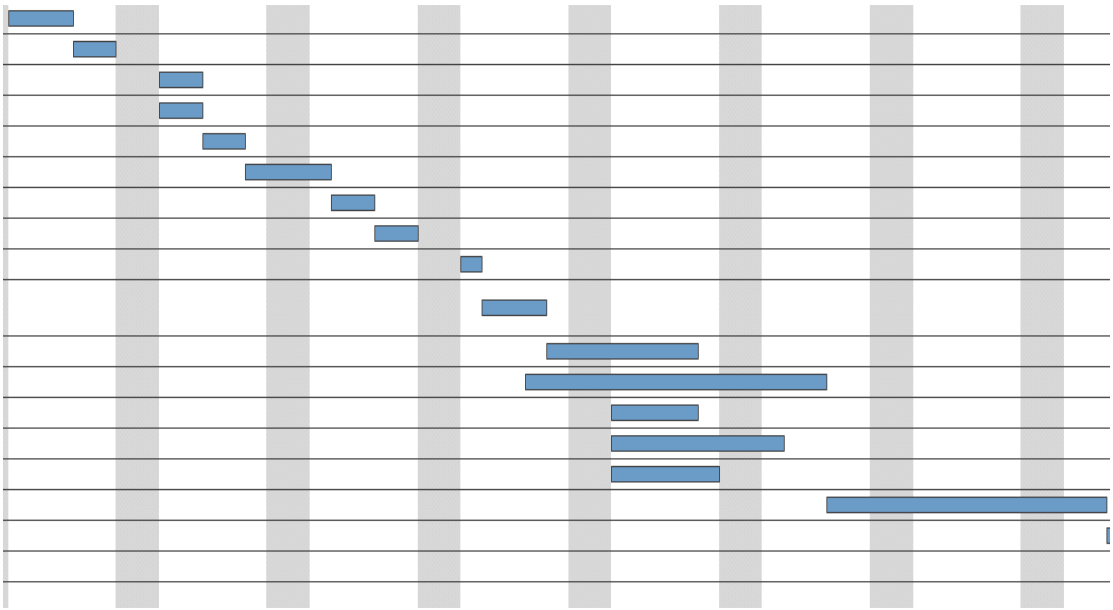
1.5 Gantt chart

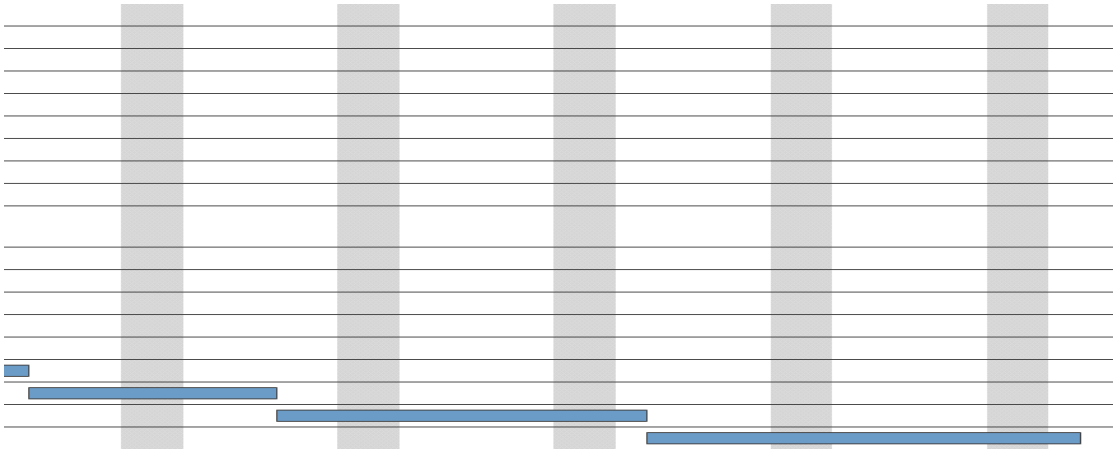
The Gantt chart enumerates the activities to be performed on the vertical axis and their corresponding duration on the horizontal axis. The tasks identified and enlisted are based on task dependency table. It is possible to schedule activities by either early start or late start logic.
Following is the Gantt chart of our project.

ID	Task Name	Start	Finish	Duration	Resource Names
1	Writing Project Proposal	11/1/2013	11/11/2013	7d	Saniya,Amna, Zeeshan,Muavia
2	Creating Vision document and Risk List	11/13/2013	11/13/2013	1d	Amna
3	System Level Requirements Analysis	11/14/2013	11/14/2013	1d	Amna,Saniya
4	Writing Project Feasibility Report	11/15/2013	11/15/2013	1d	Saniya,Amna
5	Project Cost Estimation	11/18/2013	11/18/2013	1d	Saniya
6	Project Scheduling (CPM, Gantt chart)	11/19/2013	11/20/2013	2d	Saniya,Zeeshan
7	Writing System Specifications	11/21/2013	11/21/2013	1d	Amna
8	Identifying External Entities	11/22/2013	11/22/2013	1d	Saniya,Amna
9	Creating Context Level DFD	11/25/2013	11/25/2013	1d	Saniya
10	Capturing "shall" statements	11/26/2013	11/27/2013	2d	Amna,Zeeshan
11	Allocating requirements	11/28/2013	11/28/2013	1d	Saniya,Amna
12	Prioritizing Requirements	11/29/2013	11/29/2013	1d	Amna,Saniya
13	Creating Requirements Traceability Matrix	12/2/2013	12/2/2013	1d	Amna
14	Creating high level use case diagram	12/3/2013	12/4/2013	2d	Saniya
15	Writing use case	12/6/2013	12/12/2013	5d	Zeeshan,Muavia
16	Creating domain model	12/13/2013	12/17/2013	3d	Zeeshan

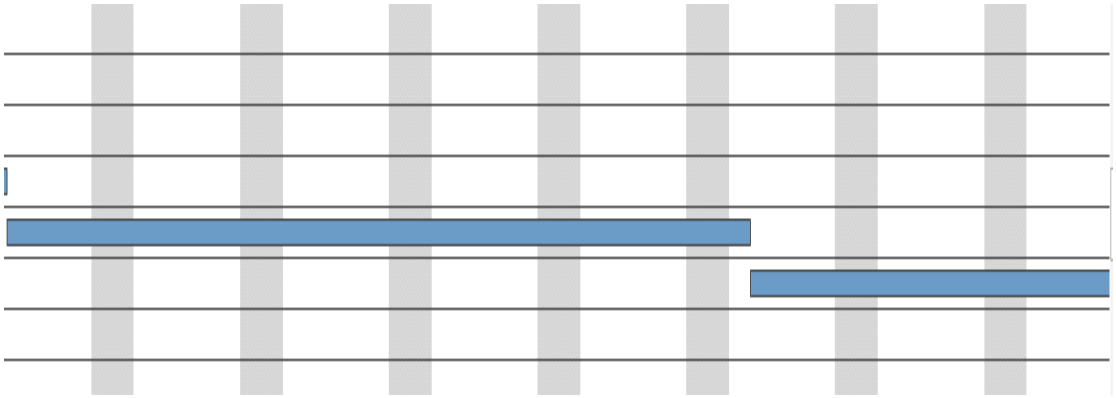


19	Writing operation contracts	12/23/2013	12/25/2013	3d	Saniya,Zeeshan
20	Design class diagram	12/26/2013	12/27/2013	2d	Amna
21	Data modeling (ERD)	12/30/2013	12/31/2013	2d	Saniya,Amna
22	Developing basic backend database	12/30/2013	12/31/2013	2d	Saniya
23	Implementing User-Registration & Login	1/1/2014	1/2/2014	2d	Zeeshan,Muavia
24	User-management	1/3/2014	1/6/2014	2d	Zeeshan,Saniya
25	User-Profile building	1/7/2014	1/8/2014	2d	Amna,Muavia
26	Implementing User-Home-page	1/9/2014	1/10/2014	2d	Saniya,Amna
27	Implementation of file-Uploading	1/13/2014	1/13/2014	1d	Zeeshan,Muavia
28	Implementation of Automatic Quiz generation, checking and assignment checking	1/14/2014	1/16/2014	3d	Muavia,Saniya
29	Grade Management	1/17/2014	1/23/2014	5d	Zeeshan,Amna
30	Announcements Handling	1/16/20144	1/29/2014	10d	Zeeshan
31	Implementation Discussion Forum	1/20/2014	1/23/2014	4d	Muavia,Amna
32	Generating Reports	1/20/2014	1/27/2014	6d	Amna
33	Attendance Management	1/20/2014	1/24/2014	5d	Saniya,Amna
34	Implementing Notification Process	1/30/2014	2/11/2014	9d	Saniya
35	Implementing System Logs	2/12/2014	2/19/2014	6d	Zeeshan,Muavia
36	Granting Access Privileges	2/20/2014	3/3/2014	8d	Zeeshan,Saniya
37	Up-grading backend database	3/4/2014	3/17/2014	10d	Saniya,Muavia





Complete Server side Integration	3/18/2014	4/21/2014	25d	Zeeshan,Muavia
Complete Client side Integration	4/22/2014	5/19/2014	20d	Saniya,Amna
Final Testing	5/20/2013	5/28/2013	7d	Saniya,Amna, Zeeshan,Muavia
Deployment	5/29/2013	6/7/2013	8d	Saniya,Amna, Zeeshan,Muavia



1.6 Introduction to Team member and their skill set

Group Members	**Skills**
Amna Kazmi	She has an excellent grip on the Technical Domain of the project. She is skillful in handling Database, Software Engineering and Interface Development.
Muhammad Zeeshan Arshad	He is hard working, motivated and devoted to his work. He has strong programming skills and has excellent skills in analyzing algorithms.
Saniya Tauqir	She has good knowledge of Interface development GUI design, Database and project scheduling. She is also expert in the software Engineering and Development.
Muavia Rehman	He is very skillful and sharp regarding software development and has good programming skills. He is a quick learner and have also keen observation regarding, quality of the project.

1.7 Tools and Technology with reasoning

The application tools, which are to be used on front and back end of the system to be developed are following with reason described.

Tools:-

- **Microsoft Visual Studio 2012** – C# development, using with .Net Framework.
- **Eclipse** – Code editor and compiler for java/android.
- **MS Word** - For documentation.
- **MS Visio** - For flowcharts, ERD's and visual documentation.
- **MS Project** - Gantt chart
- **Text Pad** - Light text editor
- **Source Tree** – To use with **GitHub** for code management and versioning.
- **Firefox** – Internet Browser for development purposes with firebug extension.
- **Sql Management Studio**
- **Adobe Dreamweaver** – UI design and development.
- **BitBucket.org** – provide GitHub private repository.

Technologies:-

- **Sql Server** - For data storage.
- **Apache Server** - Web server.
- **C#**- Language platform.
- **JAVA** - Language platform.
- **Gi**t - Source / version management.
- **JavaScript** – form validation and Ajax

1.8 Vision Document

Introduction

In the time since 2000 PUCIT has been facilitating the field of Information Technology by providing competent young professionals. We will be developing a project that will lead to huge increment in the communication and learning process by providing a handy system for students, teachers and university. This is a development project related to web and mobile computing aimed to facilitate all the major entities involved in the University. Providing a better, quick and responsive communication system for students, teachers, exam branch and societies.

Business Opportunity

The primary role of this application would be to create a user friendly environment between the faculty and the students. It would be type of a social network for PUCIT having many other side features thus, fulfilling the essential requirements of entities in effective and secure manner.
Success will also attract other major Universities to engage us for developing similar application for them.

Problem Statement

At present there exists no such mobile application for PUCIT which may lead to better communication between students and teachers. If there is any university announcement to be made, a person is sent to respective classes/offices for intimation.

Key high level goals and problems faced with current methodologies

High level Goal	Priority	Problem and Concerns	Current Solution
Quick responsive Communication	High	The chances of reply are low.	Currently emails are used for communication.
Generating Notifications	High	The chances are notification's don't get received	Notice board is used for notifications

1.9 Risk List

The Risk List is designed to capture the perceived risks to the success of the project. Following are the risks identified.

Table 6: Risk Identification

Sr. No.	Risk	Source (How can the risk occur)	Impact (What is the impact of the risk occurring)
1	Media crash or instance crash	Hard disk files crash, instance crash due to power failure	Database inconsistency
2	Non serious attitude of team member	Team members lost motivation	Efficiency of project will decrease
3	Unavailability of internet	Unavailability of internet server, hardware problem of mobile in catching signals of WIFI etc	Failure of application
4	Unavailability of any developer	Some genuine problem of developer, natural disasters etc	Delay in project
5	Lack of customer interest in the application.	Risk can be occurred due to poor interface and designing of application.	Marketing value of our application will be decreased.
6	Network congestion.	Too much traffic on the network due to any calamity or interruptions or alternate paths.	It has high impact on the performance of the application as unexpected delay will occur in notification sending.
7	More Power Consumption by the application.	The application start pinging the server much more time than required.	High impact on marketing of the application. People will not prefer the application due to high energy consumption.

Requirement Engineering

1. Introduction

Requirement Engineering shall lead us doing requirement elicitation and requirements specification that would lead to the following four steps:

- Identify external interfaces
- Development of context diagram
- Capture "shall statements
- Allocate requirements
- Prioritize requirements
- Development of requirements traceability matrix.

1.1 Systems Specifications

The following are the clauses that must be included while describing the system specifications.

Introduction

Rapid growth of technology has great impact on lives of people. Automated systems are preferred instead of manual work. PUCIT is a well-known IT institute in Pakistan giving country competent IT professionals. The application **"SocioPUCIT"** will increase communication gap between students and teachers by providing discussion forums etc. thus leading to increase in learning curve of students. Apart, from studies students can easily take part in co-curricular activities by getting updates from societies.

An important feature of application is automatic quiz checking and grade updating of students leading to less paper work of teachers and machine-use make things clear effective and efficient.

Existing System

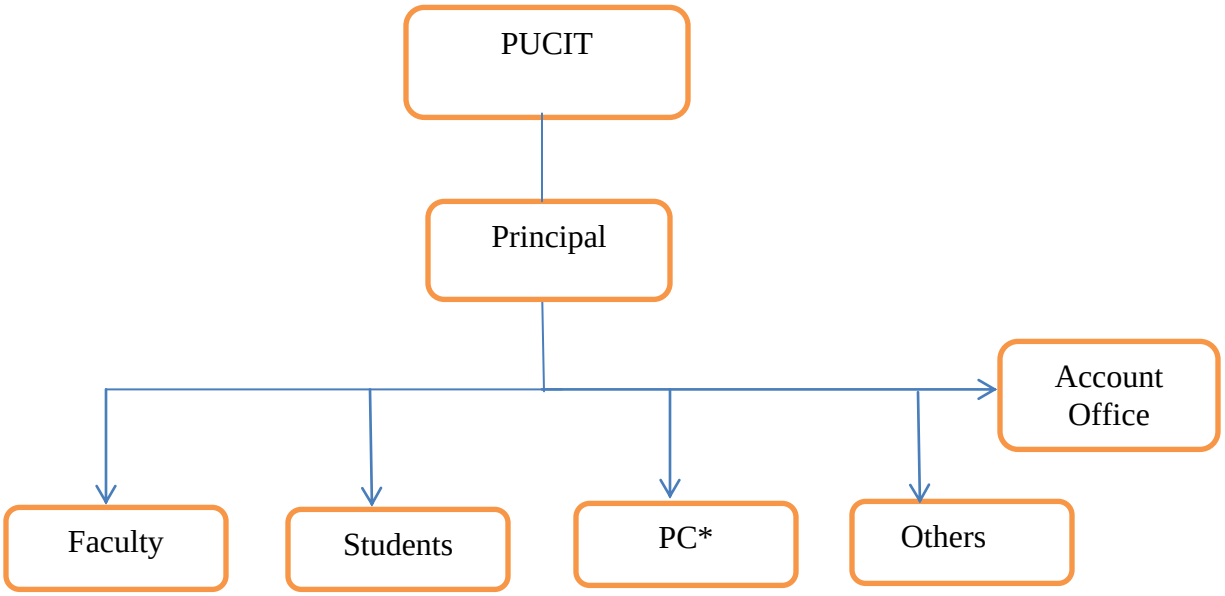
Generally different websites exist where teachers can make a classroom and interact with students, but as they are websites delayed response is a major con. This is special feature of our application i.e. providing student-teacher and societies a platform

for discussion and announcements respectively. Any announcement related to societies or classes will be made through our application and targeted audience will be notified so students will get notifications on their mobile devices.

Another important feature that will be given through our application would be automatic quiz checking (multiple choice questions) students will be able to attempt quiz and getting results at the time of submission. One important feature would be accessing their attendance and grades from home. As the system would be available online

Organizational Chart

Organizational chart will be very much supportive to get a better overview of the organization's business areas and their decomposition into different departments.



Scope of the System

The Scope may include the boundaries of the system under study. Following are the phases in which scope is divided.

Phase 1: Analysis and Design:

- Analyse the requirements for "**SocioPUCIT"**
- Division of the **architecture** into small components or modules to specify the design with the functionalities performed.

Phase 2: Implementation:

- Develop the interface of Application.
- Develop the automatic quiz, assignment checking modules.
- Develop teacher, student, custom user, exam branch modules.
- Develop the database.

Phase 3: Integration and Testing:

- Develop test plans for testing the complete project.
- Unit testing of each component.

- Integration of small components in mobile and web side.
- Perform application testing.

Summary of Requirements (Initial Requirements)

Following is the abstract to give an understanding of initial requirements of the system. "**SocioPUCIT"** must fulfil these requirements.

Teacher section

A proper login account must be provided to teacher from where teacher can manage student's grades and attendance. News and announcements regarding course, makeup class, upcoming quizzes assignments and project shall be done through application. Teachers can post on discussion forums.

Student section

Students shall be provided logins for the application. They shall check the announcements from societies, program coordinator and courses. Application shall give students facility to check their attendance and grades from their homes. Students shall submit assignments through application can post on discussion forums and update their profiles.

Custom users section

All custom users of the application like placement office, project office, LS shall be provided login through application they shall notify students regarding important deadlines and updates. Societies shall make announcements regarding upcoming events.

Administrator section

Administrator will be provided a login. Admin will be given privileges to view logs and manage overall working of the system.

1.8.6 Identifying External Entities or Actors

The Identification of External Entities or Actors is done in two phases.

1.8.7Over Specify Entities from Abstract

On the basis of the Abstract, we identified the following entities from our project

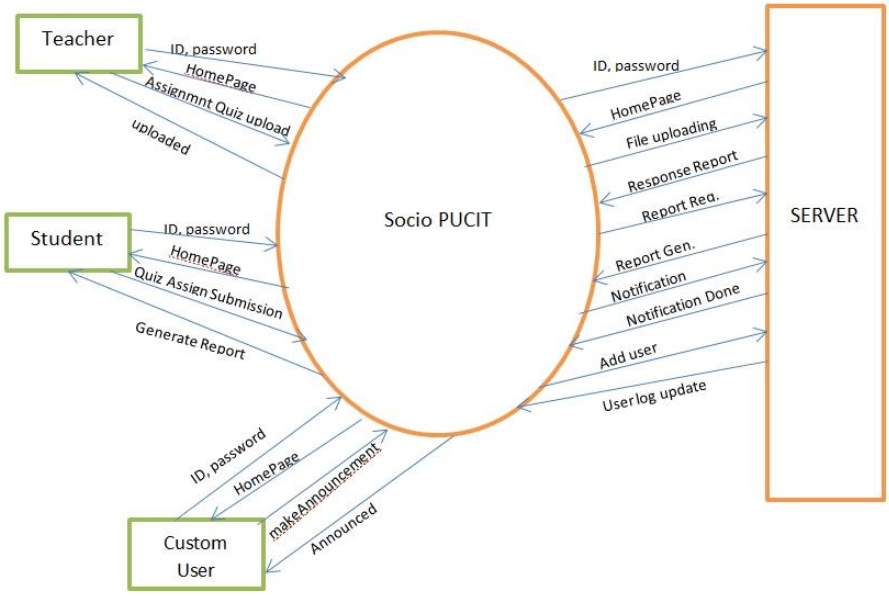
- Student
- Teacher
- Placement office
- Administrator
- Project office
- Literacy society
- Computer society
- Dramatic society

1.8.8 Perform Refinement

We found the following entities more related to our Business Logic;

- Student
- Teacher
- Custom user
- Administrator

1.9 Context level Data Flow Diagram



1.1.1 Capture "shall" Statements and the external entities (Actors)

Para #	External Entity	Initial Requirement
1.0	Teacher	Teacher shall be registered to login

1.0	Student	Student shall be registered to login
1.0	Custom user	Custom user shall be registered to login.
1.0	Admin	Admin shall login
1.0	Teacher	Teacher shall login
1.0	Student	Student shall login
1.0	Custom user	Custom user login.
2.0	Teacher	Teacher shall make announcement.
2.0	Custom user	Custom user shall make announcement.
3.0	Teacher	A teacher shall 'mark attendance' of students registered in the course.
3.0	System	System shall bring the list of registered students to mark their attendance.
3.0	Teacher	A teacher shall mark grades of students registered in the course
3.0	System	System shall update the grades of students
4.0	Teacher	A teacher shall login to post on discussion forum.
4.0	Student	A student shall login to post on discussion forum.
4.0	System	System shall ping all the group members of the forum.
3.0	Teacher	A teacher shall conduct the quiz.
3.0	System	System shall generate the quiz automatically.
3.0	Student	A student shall attempt quiz.
3.0	Student	A student shall submit quiz.
3.0	System	System shall automatically check quiz.
3.0	System	System shall update marks.
3.0	Teacher	A teacher shall attach files to upload

3.0	System	System shall upload the files in teacher course contents.
3.0	Student .	A student shall submit assignment.
3.0	System	System shall upload assignment to respective teacher
3.0	Student	A student shall request to view attendance of currently registered course.
3.0	System	System shall show detail of attendance of registered subject
3.0	Student	A student shall view grades of enrolled courses.
3.0	System	System shall accept request and show updated grades.
3.0	Teacher	A teacher shall view submitted assignments.
3.0	Student	A student shall view current assignments.
3.0	System	System shall generate the view of submitted assignments to teacher.
3.0	Teacher	A teacher shall view quiz results.
3.0	System	System shall show the details of quiz results.
2.0	Teacher	A teacher shall request to view messages.
2.0	Student	A student shall request to view messages.
2.0	System	System shall accept request of user generate view of messages.
3.0	Teacher	A teacher shall view course material.
3.0	Student	A student shall view course material.

3.0	System	System shall generate view for currently uploaded material according to courses.
3.0	Teacher	Teacher shall view system logs
7.0	System	System shall generate view for logs.
7.0	Admin	Admin shall do user management.
7.0	System	System shall update database.
7.0	Admin	Admin shall edit settings.
7.0	System	System shall update settings.

1.8.10 Allocate Requirement

Para #	**Initial Requirement**	**Use Case name**
1.0	Student shall be registered to login.	
1.0	Custom user shall be registered to login.	
1.0	Admin shall login.	UC_login
1.0	Teacher shall login.	
1.0	Student shall login.	
1.0	Custom user shall login.	
2.0	Teacher shall make announcements	UC_make_annoucement_
2.0	Custom users shall make announcements	
2.0	System shall notify targeted audience.	UC_send_notification_
3.0	A teacher shall ‘mark attendance’ of students registered in the course.	UC_mark_attendance_
3.0	System shall bring the list of registered	UC_generate_attendance_list_

	students to mark their attendance.	
3.0	A teacher shall mark grades of students registered in the course	UC_mark_grades_
3.0	System shall update the grades of students.	UC_update_grades_
4.0	A teacher shall login to post on discussion forum.	UC_teacher_forum_post_
4.0	A student shall login to post on discussion forum.	UC_student_forum_post_
4.0	System shall ping all the group members of the forum.	UC_notify_members_
3.0	A teacher shall conduct the quiz.	UC_conduct_quiz_
3.0	System shall generate the quiz automatically.	UC_generate_quiz_
3.0	A student shall attempt quiz.	UC_attempt_quiz_
3.0	A student shall submit quiz.	UC_submit_quiz_
3.0	System shall automatically check quiz.	UC_check_quiz_

3.0	System shall update marks.	UC_update_quiz_grades_
3.0	A teacher shall attach files to upload.	UC_attach_files_
3.0	System shall upload the files in teacher course contents.	UC_upload_files_
3.0	A student shall submit assignment.	UC_submit_assignment_

3.0	System shall upload assignment to respective teacher.	UC_upload_assigment_
3.0	A student shall request to view attendance of currently registered course.	UC_view_attendance_
3.0	System shall show detail of attendance of registered subject.	UC_show_attendance_
3.0	A student shall view grades of enrolled courses.	UC_view_grades_
3.0	System shall accept request and show updated grades.	UC_show_grades_
3.0	A teacher shall view submitted assignments.	UC_view_assignments_
3.0	A student shall view current assignments.	UC_view_assignments_
3.0	System shall generate the view of submitted assignments to teacher.	UC_generate_assigments_view_
3.0	A teacher shall view quiz results.	UC_view_quiz_results
3.0	System shall show the details of quiz results.	UC_show_result_detail
2.0	A teacher shall request to view messages.	UC_view_messages_
2.0	A student shall request to view messages.	
2.0	A custom user shall view messages.	
2.0	System shall accept request of user generate view of messages.	UC_show_messages_

3.0	A teacher shall view course material.	UC_view_course_content_
3.0	A student shall view course material.	UC_view_course_content_
3.0	System shall generate view for currently uploaded material according to courses.	UC_show_contents_
3.0	Teacher shall view system logs	UC_view_logs
3.0	System shall generate view for logs.	UC_generate_logs_view
7.0	Admin shall do user management.	UC_management
7.0	System shall update database.	UC_update_DB
7.0	Admin shall edit settings.	UC_edit_settings
7.0	System shall update settings.	UC_update_settings

1.1.2 Priorities Requirements

Para #	**Rank**	**Initial Requirement**	**Use Case ID**	**Use Case name**
1.0	Highest	Teacher shall be registered to login.	UC_1	UC_registration
1.0	Highest	Student shall be registered to login.	UC_1	
1.0	Highest	Custom user shall be registered to login.	UC_1	

1.0	Highest	Teacher shall login.	UC_2	UC_login
1.0	Highest	Student shall login.	UC_2	
1.0	Highest	Custom user shall login.	UC_2	
1.0	Highest	Admin shall login	UC_2	
3.0	Highest	Teacher shall view system logs	UC_3	UC_view_logs
3.0	Highest	System shall generate view for logs.	UC_4	UC_generate_logs_view
7.0	Highest	Admin shall do user management.	UC_5	UC_management
7.0	Highest	System shall update database	UC_6	UC_update_DB
7.0	Highest	Admin shall edit settings.	UC_7	UC_edit_settings
7.0	Highest	System shall update settings.	UC_8	UC_update_settings

2.0	Highest	Teacher shall make announcements	UC_9	UC_make_annoucement_
2.0	Highest	Custom users shall make announcements		
2.0	Highest	System shall notify targeted audience.	UC_4	UC_send_notification_
3.0	Highest	A teacher shall 'mark attendance' of students registered in the course.	UC_5	UC_mark_attendance_
3.0	Highest	System shall bring the list of registered students to mark their attendance.	UC_6	UC_generate_attendance_list_
3.0	Highest	A teacher shall mark grades of students registered in the course	UC_7	UC_mark_grades_
3.0	Highest	System shall update the grades of students.	UC_8	UC_update_grades_
3.0	Highest	A teacher shall login to post on discussion forum.	UC_9	UC_teacher_forum_post_
4.0	Highest	A student shall login to post on discussion forum.	UC_10	UC_student_forum_post_
4.0	Highest	System shall ping all the group members of the forum.	UC_11	UC_notify_members_
3.0	Highest	A teacher shall conduct the quiz.	UC_12	UC_conduct_quiz_

3.0	Highest	System shall generate the quiz automatically.	UC_13	UC_generate_quiz_
3.0	Highest	A student shall attempt quiz.	UC_14	UC_attempt_quiz_
3.0	Highest	A student shall submit quiz.	UC_15	UC_submit_quiz_
3.0	Highest	System shall automatically check quiz.	UC_15	UC_check_quiz_
3.0	Highest	System shall update marks.	UC_16	UC_update_quiz_grades_
3.0	Highest	A teacher shall attach files to upload.	UC_17	UC_attach_files_
3.0	Highest	System shall upload the files in teacher course contents.	UC_18	UC_upload_files_
3.0	Highest	A student shall submit assignment.	UC_19	UC_submit_assignment_
3.0	Highest	System shall upload assignment to respective teacher.	UC_20	UC_upload_assigment_
3.0	Medium	A student shall request to view attendance of currently registered course.	UC_21	UC_view_attendance_
3.0	Medium	System shall show detail of attendance of registered subject.	UC_22	UC_show_attendance_

3.0	Medium	A student shall view grades of enrolled courses.	UC_23	UC_view_grades_
3.0	Medium	System shall accept request and show updated grades.	UC_24	UC_show_grades_
6.0	Lowest	A teacher shall view submitted assignments.	UC_25	UC_view_assignments_
3.0	Lowest	A student shall view current assignments.	UC_26	UC_view_assignments_
3.0	Lowest	System shall generate the view of submitted assignments to teacher.	UC_27	UC_generate_assigments_view_
3.0	Lowest	A teacher shall view quiz results.	UC_28	UC_view_quiz_results
3.0	Lowest	System shall show the details of quiz results.	UC_29	UC_show_result_detail
2.0	Lowest	A teacher shall request to view messages.	UC_30	UC_view_messages_
2.0	Lowest	A student shall request to view messages.		
2.0	Lowest	System shall accept request of user generate view of messages.	UC_31	UC_show_messages_

3.0	Lowest	A teacher shall view course material.	UC_32	UC_view_course_content_
3.0	Lowest	A student shall view course material.	UC_33	UC_view_course_content_
3.0	Lowest	System shall generate view for currently uploaded material according to courses.	UC_34	UC_show_contents_

1.8.12 Requirements Traceability Matrix

Sr #	Para #	Initial Requirement	Build	Use Case name	Category
1)	1.0	Teacher shall be registered to login.	B1	UC_registration	Business
2)	1.0	Student shall be registered to login.	B1		
3)	1.0	Custom user shall be registered to login.	B1		
4)	1.0	Teacher shall login.	B1	UC_login	
5)	1.0	Student shall login.	B1		
6)	1.0	Custom user shall login.	B1		Business
7)	1.0	Admin shall login	B1		
8)	3.0	Teacher shall view logs	B1	UC_view_logs	Business

9)	3.0	System shall generate view for logs.	B1	UC_generate_logs_view	Business
10)	7.0	Admin shall do user management.	B1	UC_management	Business
11)	7.0	System shall update database	B1	UC_update_DB	Business
12)	7.0	Admin shall edit settings.	B1	UC_edit_settings	Business
13)	7.0	System shall update settings.	B1	UC_update_settings	Business
14)	2.0	Teacher shall make announcements	B1	UC_make_annoucement_	Business
15)	2.0	Program coordinator shall make announcements.	B1		Business
16)	2.0	Custom users shall make announcements	B1		Business
17)	2.0	System shall notify targeted audience.	B1	UC_send_notification_	Business
18)	3.0	A teacher shall ‘mark attendance’ of students registered in the course.	B1	UC_mark_attendance_	Business
19)	3.0	System shall bring the list of registered students to mark their attendance.	B1	UC_generate_attendance_list_	Business

20)	3.0	A teacher shall mark grades of students registered in the course	B1	UC_mark_grades_	Business
21)	3.0	System shall update the grades of students.	B1	UC_update_grades_	Business
22)	3.0	A teacher shall login to post on discussion forum.	B1	UC_teacher_forum_post_	Business
23)	4.0	A student shall login to post on discussion forum.	B1	UC_student_forum_post_	Business
24)	4.0	System shall ping all the group members of the forum.	B1	UC_notify_members_	Business
25)	3.0	A teacher shall conduct the quiz.	B1	UC_conduct_quiz_	Business
26)	3.0	System shall generate the quiz automatically.	B1	UC_generate_quiz_	Business
27)	3.0	A student shall attempt quiz.	B1	UC_attempt_quiz_	Business
28)	3.0	A student shall submit quiz.	B1	UC_submit_quiz_	Business
29)	3.0	System shall automatically	B1	UC_check_quiz_	Business

		check quiz.			
30)	3.0	System shall update marks.	B1	UC_update_quiz_grades_	Business
31)	3.0	A teacher shall attach files to upload.	B1	UC_attach_files_	Business
32)	3.0	System shall upload the files in teacher course contents.	B1	UC_upload_files_	Business
33)	3.0	A student shall submit assignment.	B1	UC_submit_assignment_	Business
34)	3.0	System shall upload assignment to respective teacher.	B1	UC_upload_assigment_	Business
35)	3.0	A student shall request to view attendance of currently registered course.	B1	UC_view_attendance_	Business
36)	3.0	System shall show detail of attendance of registered subject.	B1	UC_show_attendance_	Business
37)	3.0	A student shall view grades of enrolled courses.	B1	UC_view_grades_	Business

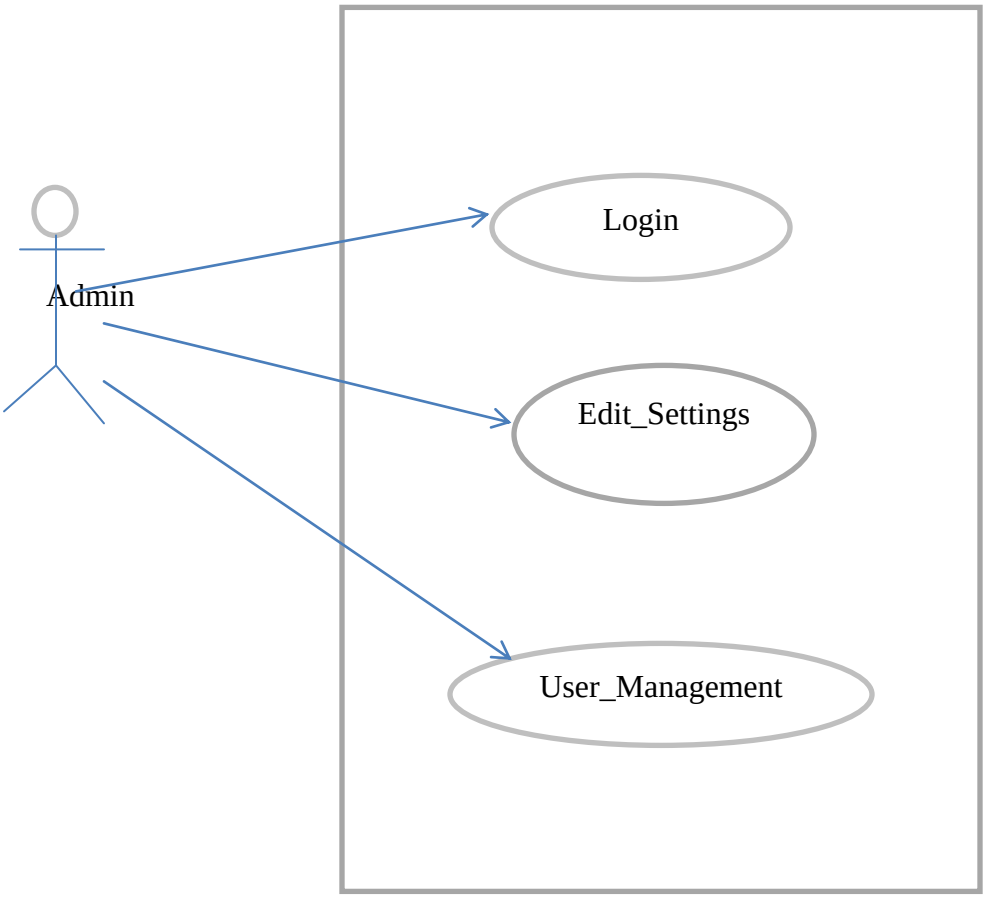
38)	3.0	System shall accept request and show updated grades.	B1	UC_show_grades_	Business
39)	5.0	A student shall view CR* home.	B1	UC_view_CR_home_	Business
40)	5.0	System shall verify student for privileges.	B1	UC_verify_privelege_	Business
41)	5.0	Program coordinator contact to CR*.	B1	UC_contact_CR_	Business
42)	3.0	Program coordinator shall view courses offered	B1	UC_view_offered_courses_	Business
43)	6.0	Custom user shall add new user.	B1	UC_add_user_	Business
44)	6.0	The system "shall" provide two types of registration process, normal and privileged.	B1	UC_provide_privileg_	Business
45)	6.0	Custom user shall remove user.	B1	UC_remove_user_	Business
46)	6.0	The system shall update	B1	UC_update_database_	Business

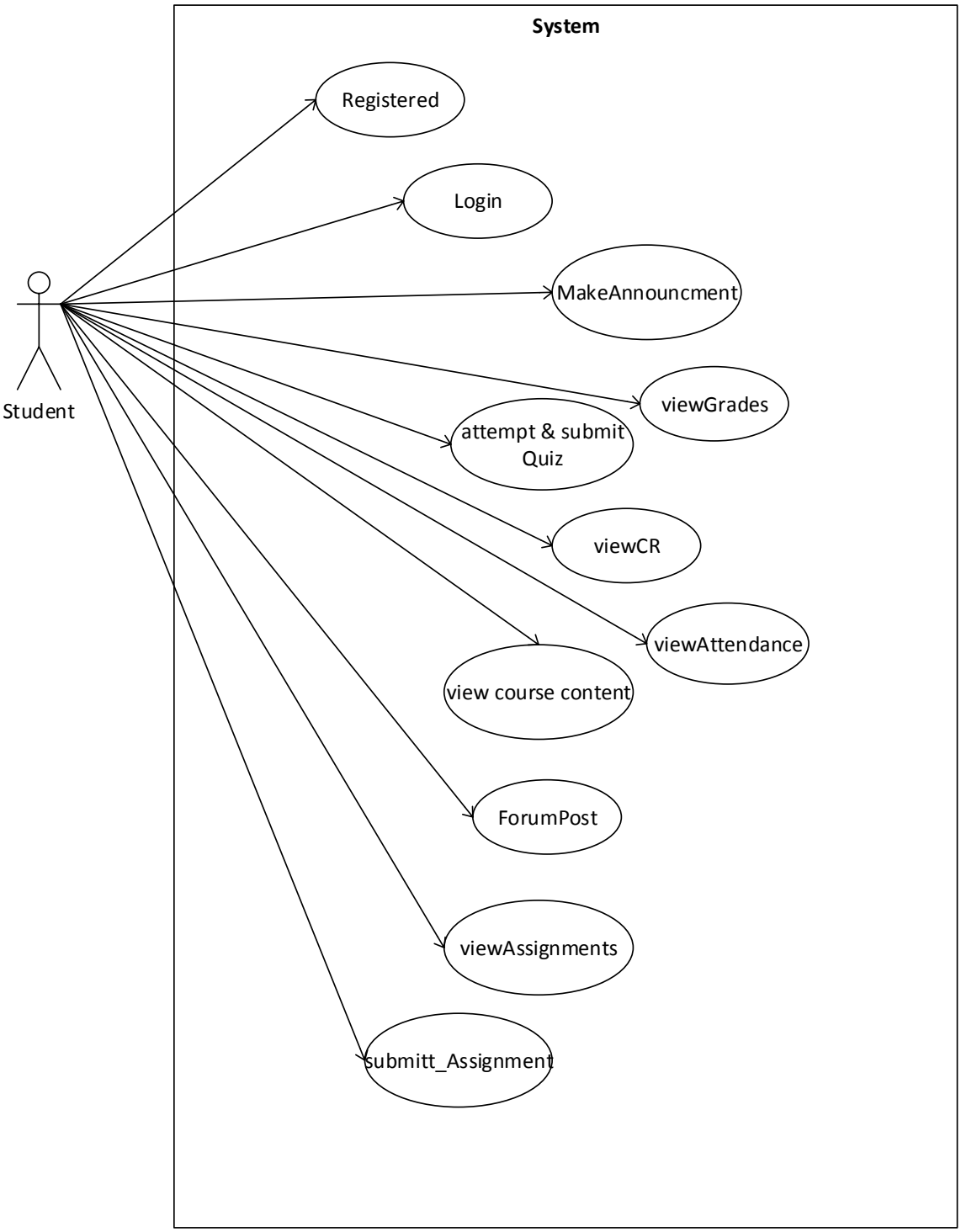
		user request.			
47)	6.0	A teacher shall view submitted assignments.	B1	UC_view_assignments_	Business
48)	3.0	A student shall view current assignments.	B1	UC_view_assignments_	Business
49)	3.0	System shall generate the view of submitted assignments to teacher.	B1	UC_generate_assigments_view_	Business
50)	3.0	A teacher shall view quiz results.	B1	UC_view_quiz_results	Business
51)	3.0	System shall show the details of quiz results.	B1	UC_show_result_detail	Business
52)	2.0	A teacher shall request to view messages.	B1	UC_view_messages_	Business
53)	2.0	A student shall request to view messages.	B1		Business
54)	2.0	A PC shall view messages.	B1		Business
55)	2.0	A custom user shall view messages.	B1		Business
56)	2.0	System shall accept request of user generate view of messages.	B1	UC_show_messages_	Business

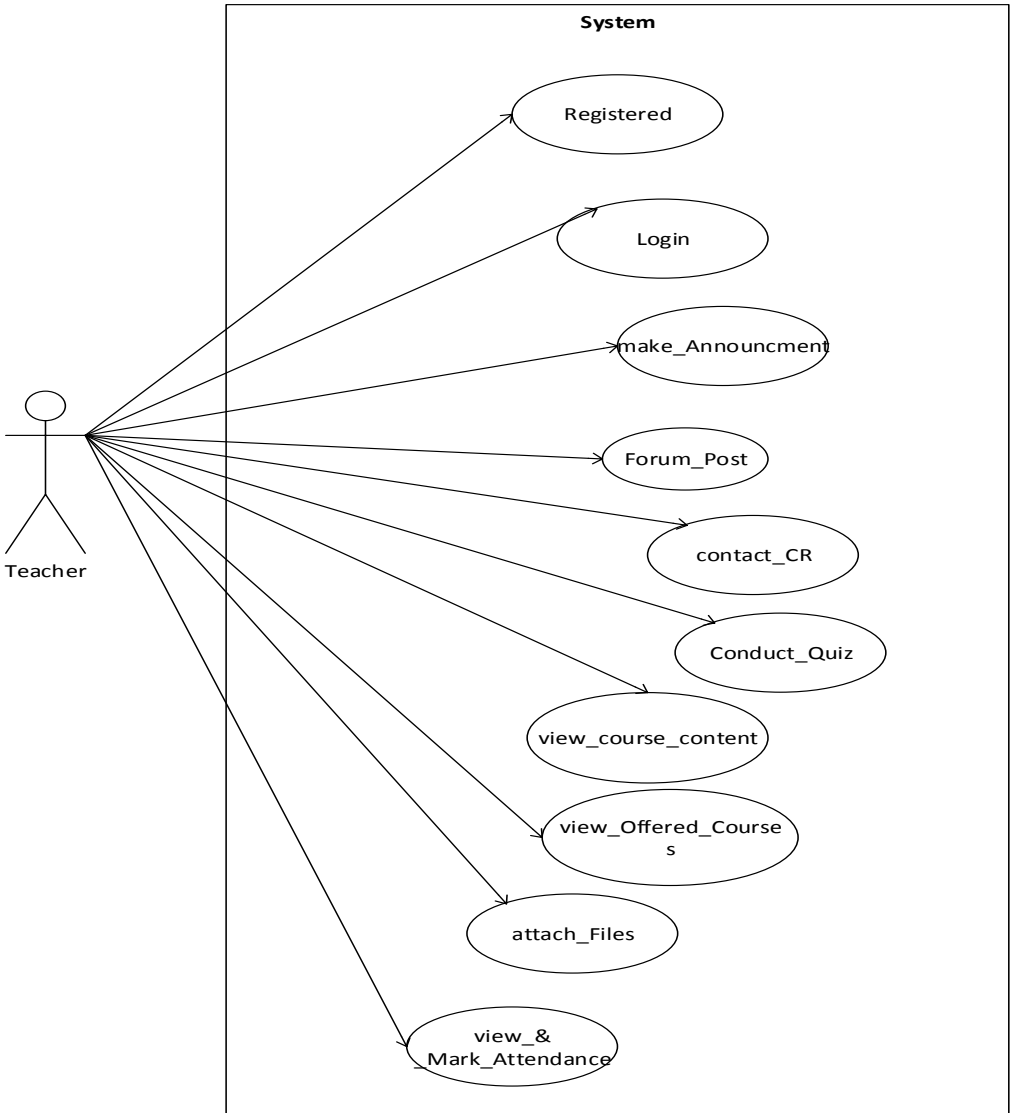
57)	3.0	A teacher shall view course material.	B1	UC_view_course_content_	Business
58)	3.0	A student shall view course material.	B1	UC_view_course_content_	Business
59)	3.0	System shall generate view for currently uploaded material according to courses.	B1	UC_show_contents_	Business
60)	7.0	Principal "shall" view reports.	B1	UC_view_reports	Business
61)	7.0	System shall generate reports.	B1	UC_generate_reports	Business

1.9 High Level Usecase Diagram

Following are the High level Usecase diagram (entitybased).







CHAPTER NO. 2

2. Introduction

This project [Socio PUCIT] will be facilitating the teacher-student coordination. This system will also be helping teachers for effective grade management and quiz conduction as quizzes will be generated randomly and checked automatically. Faculty and societies will be provided ease; for them to create/access and broadcast certain events like exams date-sheet and add drop courses etc. They can send/receive notifications for the student and teacher events.

Third deliverable is all about the use case modeling and software design. In the previous deliverable, analysis of the system is completed. So we understand the current situation of the problem domain. Now we are ready to strive for a solution for the problem domain by using object-oriented approach. Following artifacts must be included in this deliverable.

1. Use case description
2. Use case diagram refined
3. Domain Model
4. Sequence Diagram
5. Collaboration Diagram
6. Operation Contracts
7. Design Class Diagram
8. Data Model

Now we discuss these artifacts one by one as follows:

2.1 Use case Description

While technically not part of UML, use case documents are closely related to UML use cases. A use case document is text that captures the detailed functionality of a use case. Description of all use case‘s are written down. Following are the Use cases of our system with brief description.

1. Use Case : Register User

Actor

Admin

Brief Description

Admin shall be able to register a batch of users for using the software.

Preconditions

Admin has been given privileges.

Basic Flow

1. Admin will provide new users username and password.
2. Admin will submit the request

Alternate Flow

2a. Request was not submitted due to server down.

Prompt admin error.

Post Condition

Users added successfully.

2. Use Case : Login

Actor

User

Brief Description

If user wants to use the system then he/she must login. Login will be done by providing a unique username and password.

Preconditions

User shall be registered to login

Basic Flow

1. User will provide username and password.
2. User will be directed to respective homepage.
3. User can use the system according to given privileges.

Alternate Flow

1a. User provided wrong username and password.

The main screen will be shown to user to provide correct username and password combination

Post Condition

Login successful. User will be directed to homepage

3. Use Case : Make Announcement

Actor

Teacher, Program coordinator , Custom user

Brief Description

If any of the above actors wants to make an announcement regarding something then they must select targeted audience and make announcement.

Preconditions

User has login successfully and has selected the announcement option.

Basic Flow

1. User will log in to the system.
2. User will select option for making announcement.
3. User will make an announcement and submit it

Alternate Flow

3a. User doesn't submit the announcement.

Go to home screen with a message that announcement was not made.

Post Condition

Announcement made successfully.

4. Use Case: Attendance Management

Actor

Teacher

Brief Description

Teacher marks the attendance of students in subject. Through this option teacher can edit the attendance.

Preconditions

Teacher has been logged in successfully and selected any of the two options.

Basic Flow

1. Teacher will log in to the system.
2. Teacher will select option for marking attendance.
3. Teacher will mark attendance.

2. Teacher will select option for editing attendance.

3. Teacher will edit attendance.

4. Teacher will update attendance.

Alternate Flow

2a. Option page was not loaded successfully.

Error prompt will be displayed to teacher.

Post Condition

Attendance marked successfully.

5. Grades Management

Actor

Teacher

Brief Description

Teacher can mark the grades of students in subject , he/she can edit grades by viewing them.

Preconditions

Basic Flow

1. Teacher will log in to the system.
2. Teacher selects option.
3. Teacher mark attendance or edit it according to option selected.

Alternate Flow

3a. Page doesn't load properly.

Prompt and switch to home page.

Post Condition

Grades managed successfully

6. Use Case : Post on Forum

Actor Teacher, Student

Brief Description

If a teacher or a student wants to post on forum or any other discussion then they select Post on forum option.

Preconditions

Actors are member of forum

Actors has been logged in successfully and selected to post on forum option

Basic Flow

1. Teacher or student will log in to the system.
2. Teacher or student will select option for posting on forum.
3. Teacher or student will post on forum.

Alternate Flow

3a. Post wasn't successful.

Error prompt will be displayed each actor.

Post Condition

Post done successfully .

7. Use Case : Conduct Quiz

Actor

Teacher

Brief Description

If teacher wants to conduct a quiz of a class then select conduct quiz option. After selecting this option teacher shall input a question pool and system shall generate quiz randomly.

Preconditions

Teacher has been login to system.

Basic Flow

1. Teacher will log in to the system.
2. Teacher will select option for conducting quiz.
3. Teacher will input question pool and tell date, time for quiz.
4. Quiz will be generated randomly

Alternate Flow

3a. Teacher doesn't provide question pool.

3b. Teacher doesn't provide date and time.

3c. Teacher doesn't submit request to system.

Error will be prompted on all above cases.

Post Condition

Quiz generated successfully.

8. Use Case: Attempt Quiz

Actor

Student

Brief Description

If teacher has conducted a quiz of a class then student shall select attempt quiz option. After selecting this option student shall attempt the quiz and system shall update student result.

Preconditions

Student has been login to system and requested for attempting quiz.

Basic Flow

1. Student will log in to the system.
2. Student will select option for attempting quiz.
3. Student will attempt quiz and submit it.

Alternate Flow

3.a Student quits the quiz.

Student will be prompted and redirected to homepage.

Post Condition

Quiz attempted successfully.

9. Use Case: Upload Files

Actor

Teacher, Custom User

Brief Description

If actor wants to attach any document then they select option for uploading file. File can be any registration form for societies, mark sheet, exam date sheet.

Preconditions

Actor has been log in to system.

Basic Flow

1. Actor will log in to the system.
2. Actor will select option for upload file in a specific folder.

Alternate Flow

2a. File doesn't upload because of server down.

Prompt error and redirect to homepage.

Post Condition

Files uploaded successfully.

10. Use case: Submit Assignment

Actor

Student

Brief Description

If students want to submit assignment through the software of a specific course they select this option.

Preconditions

Teacher has uploaded the assignment.

Student has been log in to system.

Basic Flow

1. Student log in to the system.
2. Student selects option for upload file in a specific folder.

Alternate Flow

2a. File doesn't upload because of server down.

Prompt error and redirect to homepage.

Post Condition

Assignment submitted successfully.

11. Use Case: User Management

Actor

Admin

Brief Description

If admin wants to add/ remove new user he/she selects this option.

Preconditions

Admin shall be log in.

Admin shall have privileges for adding user.

Basic Flow

1. Admin log in to system.
2. Admin has privilege.
3. Admin selects option and performs tasks.

Alternate Flow

2a. Admin doesn't have privilege.

Error will be prompted.

Post Condition

User managed successfully.

12. Use Case: View Messages

Actor

9 Teacher, Student

Brief Description

If user wants to view messages then they select this option.

Preconditions

The actors of use case has log in the system.

Basic Flow

1. Actors will log in the system.
2. Actor select option to view messages.

Alternate Flow

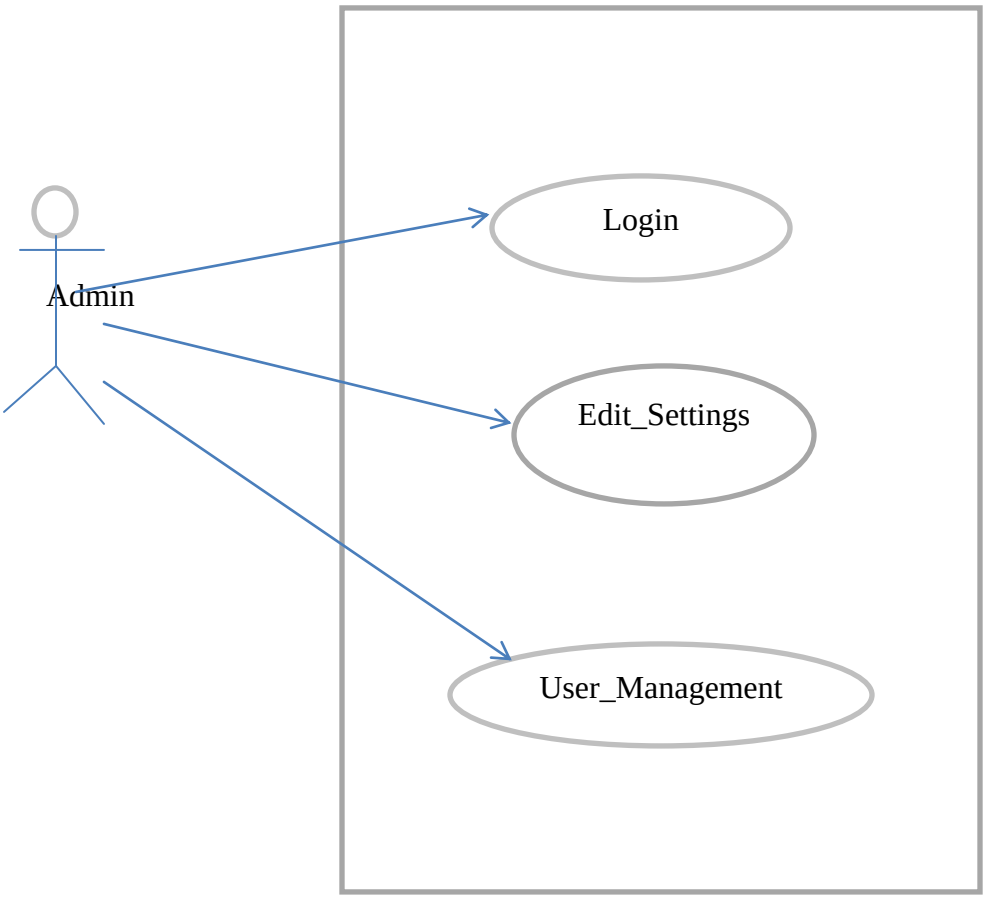
1a. Actor doesn't login successfully.

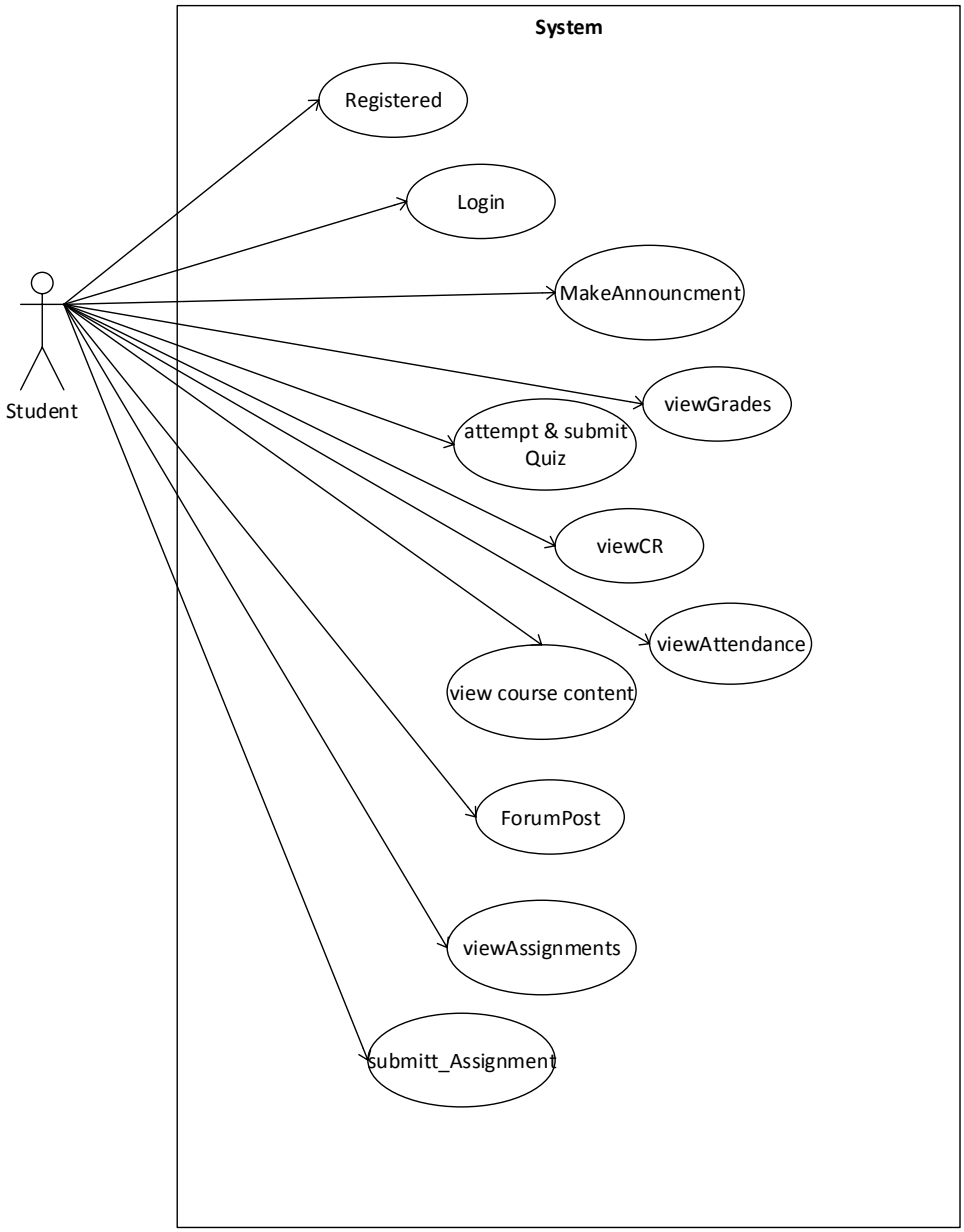
Error prompted to user.

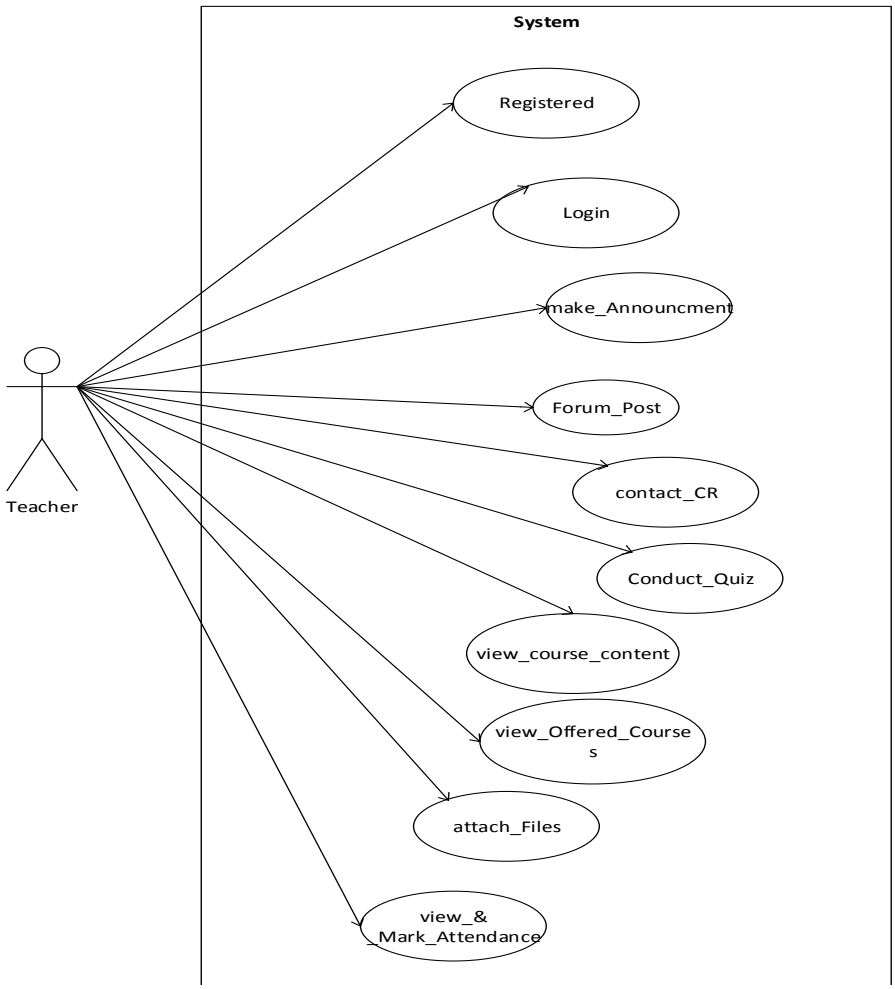
Post Condition

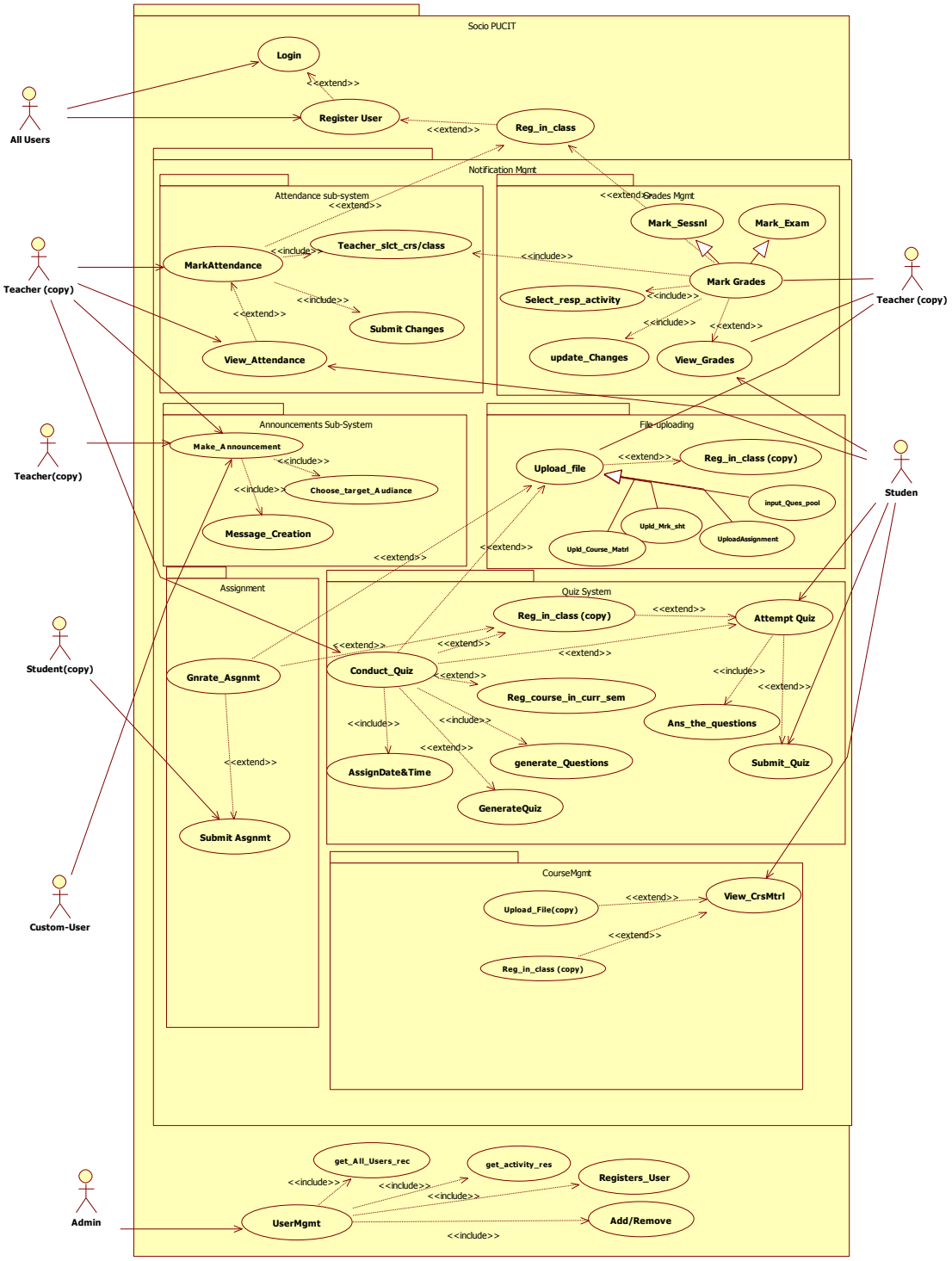
Messages viewed successfully.

2.2 Use case Diagram Analysis level

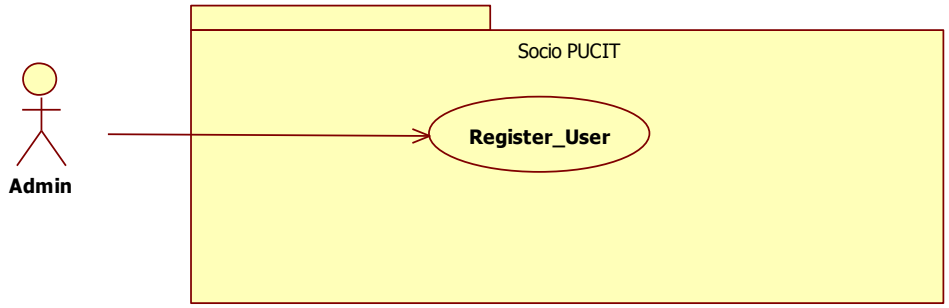




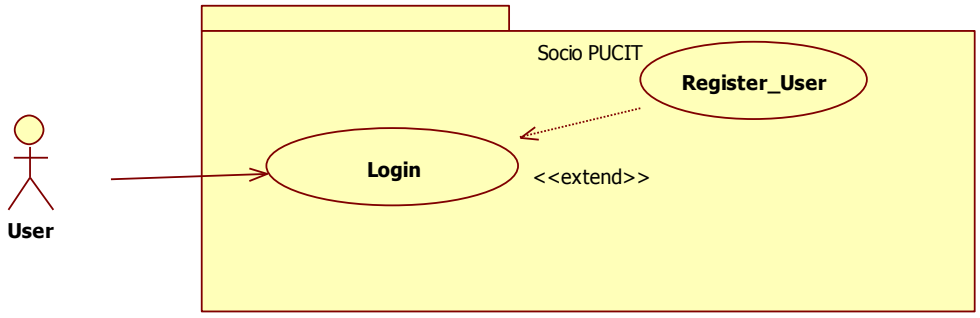




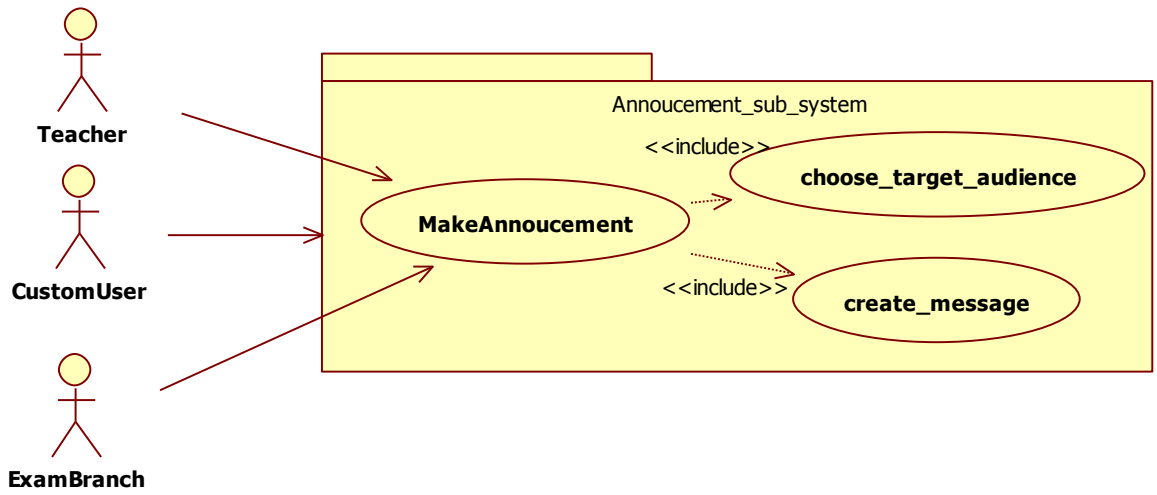
RegisterUser:-



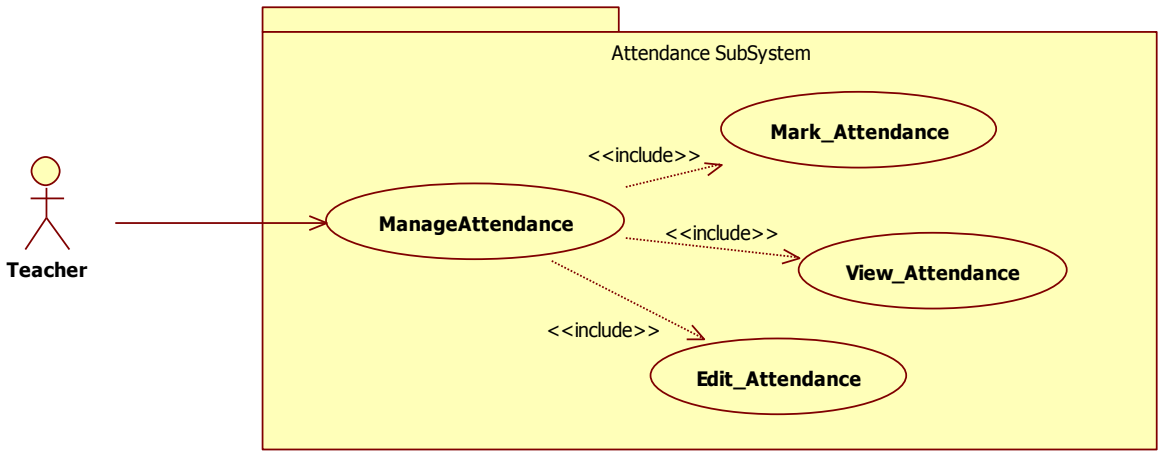
Login:-



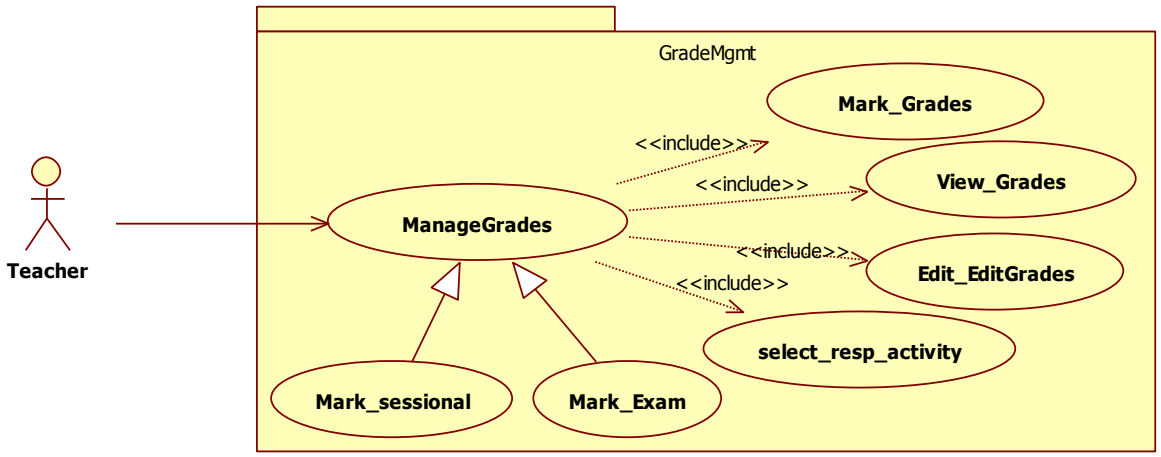
MakeAnnnouncement:-



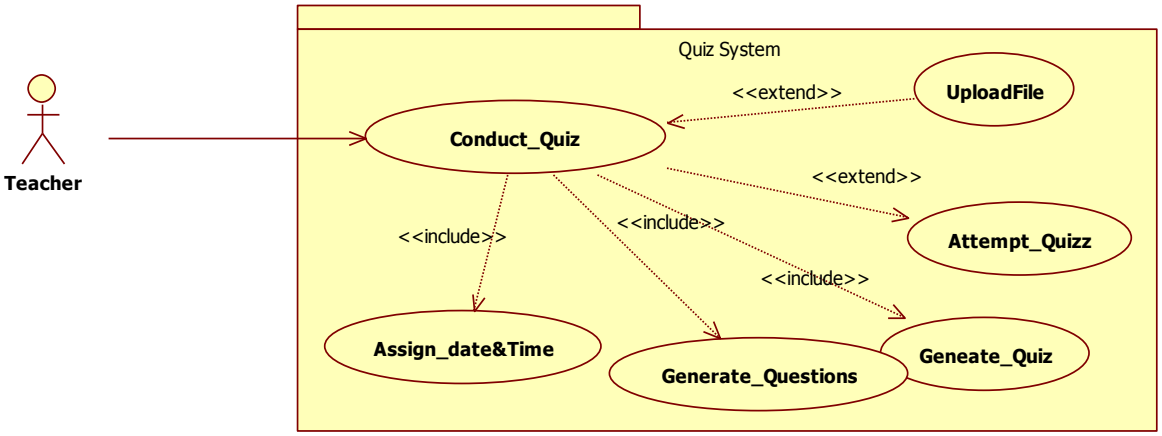
ManageAttendance:-



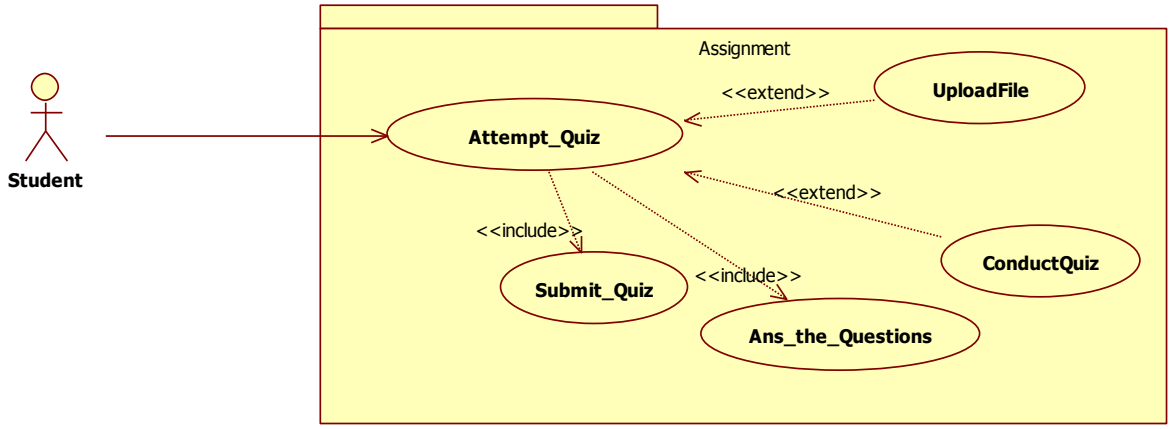
ManageGrades:-



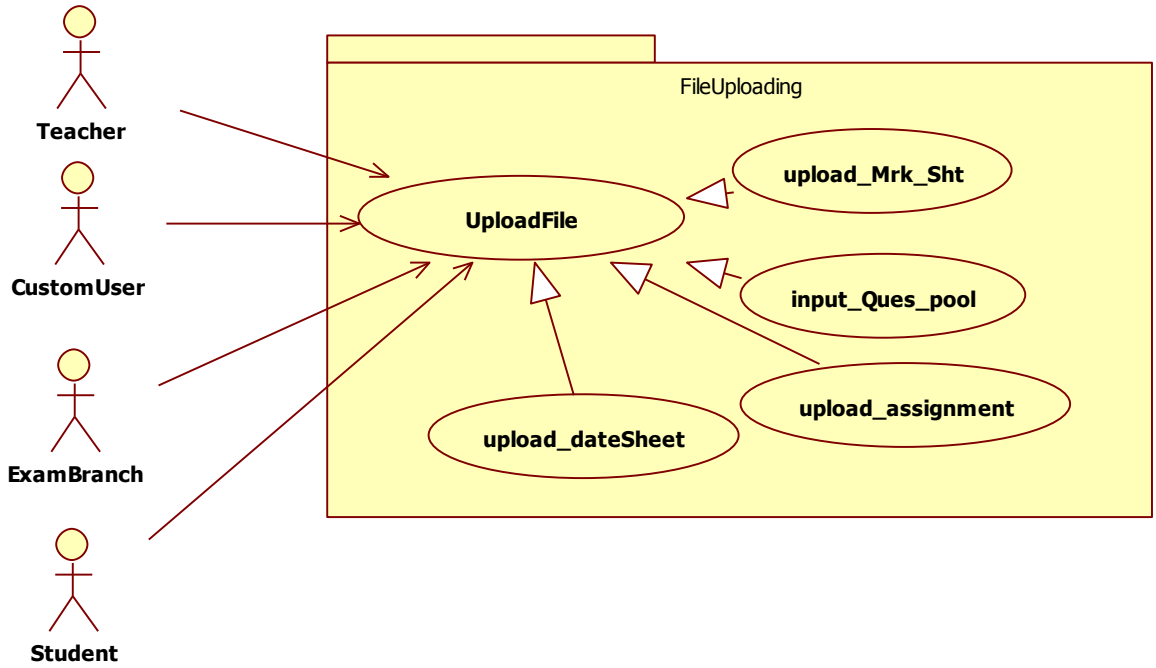
ConductQuiz:-



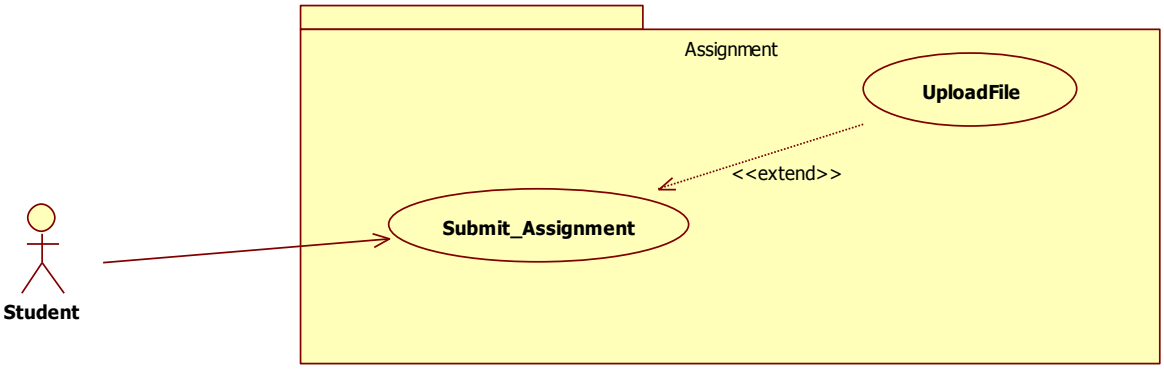
AttemptQuiz:-



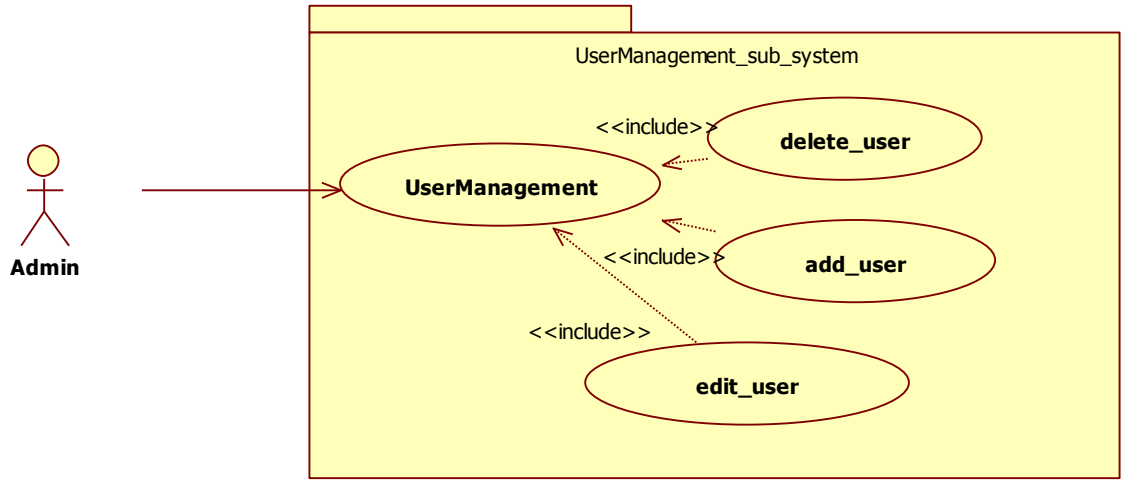
UploadFile:-



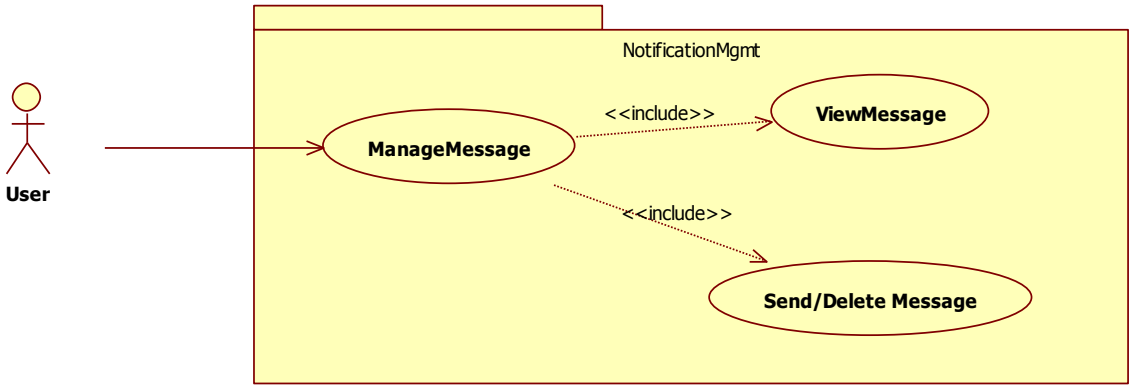
SubmitAssignment:-



UserManagement:-



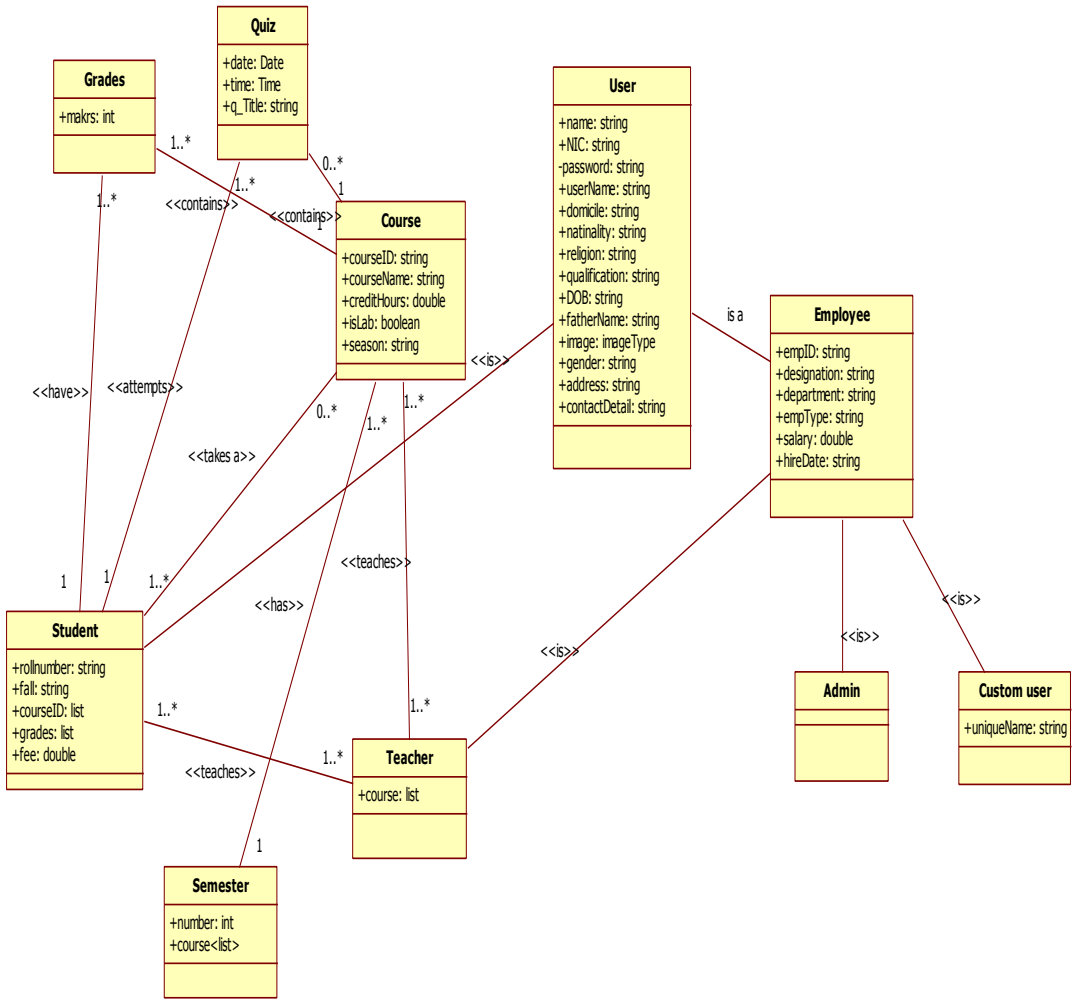
ManageMessage:-



2.3 Domain Model

Domain models represent the set of requirements that are common to systems within a product line. There may be many domains, or areas of expertise, represented in a single product line and a single domain may span multiple product lines. The requirements represented in a domain model include:

- Definition of scope for the domain
- Information or objects
- Features or use cases, including factors that lead to variation
- Operational/behavioral characteristics


Quiz
+date: Date
+time: Time
+q_Title: string
Grades
+makrs: int
User
+name: string
+NIC: string
-password: string
+userName: string
+domicile: string
+natinality: string
+religion: string
+qualification: string
+DOB: string
+fatherName: string
+image: imageType
+gender: string
+address: string
+contactDetail: string
Course
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+courseName: string
+creditHours: double
+isLab: boolean
+season: string
Employee
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+designation: string
+department: string
+empType: string
+salary: double
+hireDate: string
Student
+rollnumber: string
+fall: string
+courseID: list
+grades: list
+fee: double
Teacher
+course: list
Admin
Custom user
+uniqueName: string
Semester
+number: int
+course<list>
1..*
<<contains>>
0..*
1
<<have>>
<<attempts>>
<<takes a>>
<<is>>
is a
<<teaches>>
<<has>>

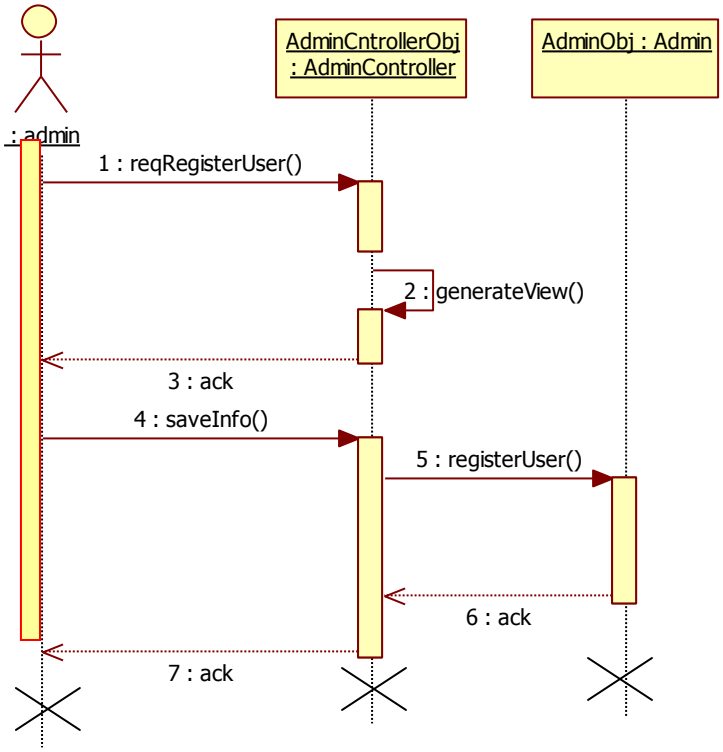
2.4 Sequence Diagram

A Sequence diagram depicts the sequence of actions that occur in a system. The invocation of methods in each object, and the order in which the invocation occurs is captured in a Sequence diagram. This makes the Sequence diagram a very useful tool to easily represent the dynamic behavior of a system.

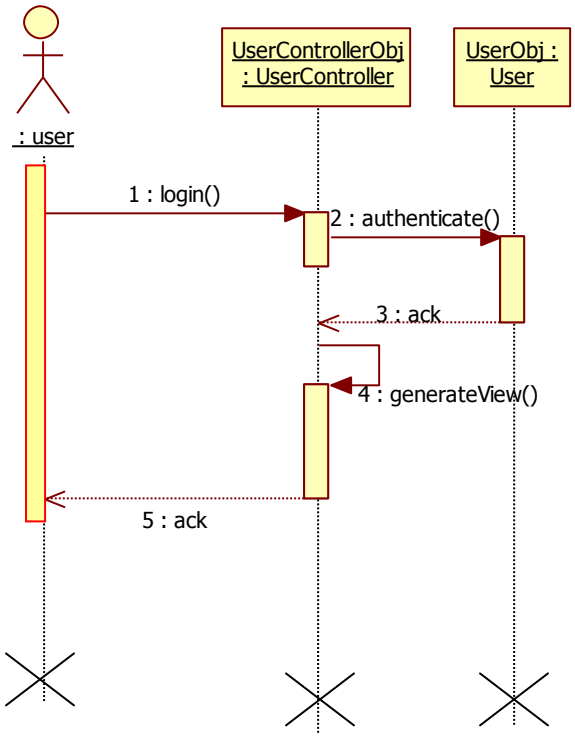
A Sequence diagram is two-dimensional in nature. On the horizontal axis, it shows the life of the object that it represents, while on the vertical axis, it shows the sequence of the creation or invocation of these objects.

Because it uses class name and object name references, the Sequence diagram is very useful in elaborating and detailing the dynamic design and the sequence and origin of invocation of objects. Hence, the Sequence diagram is one of the most widely used dynamic diagrams in UML.

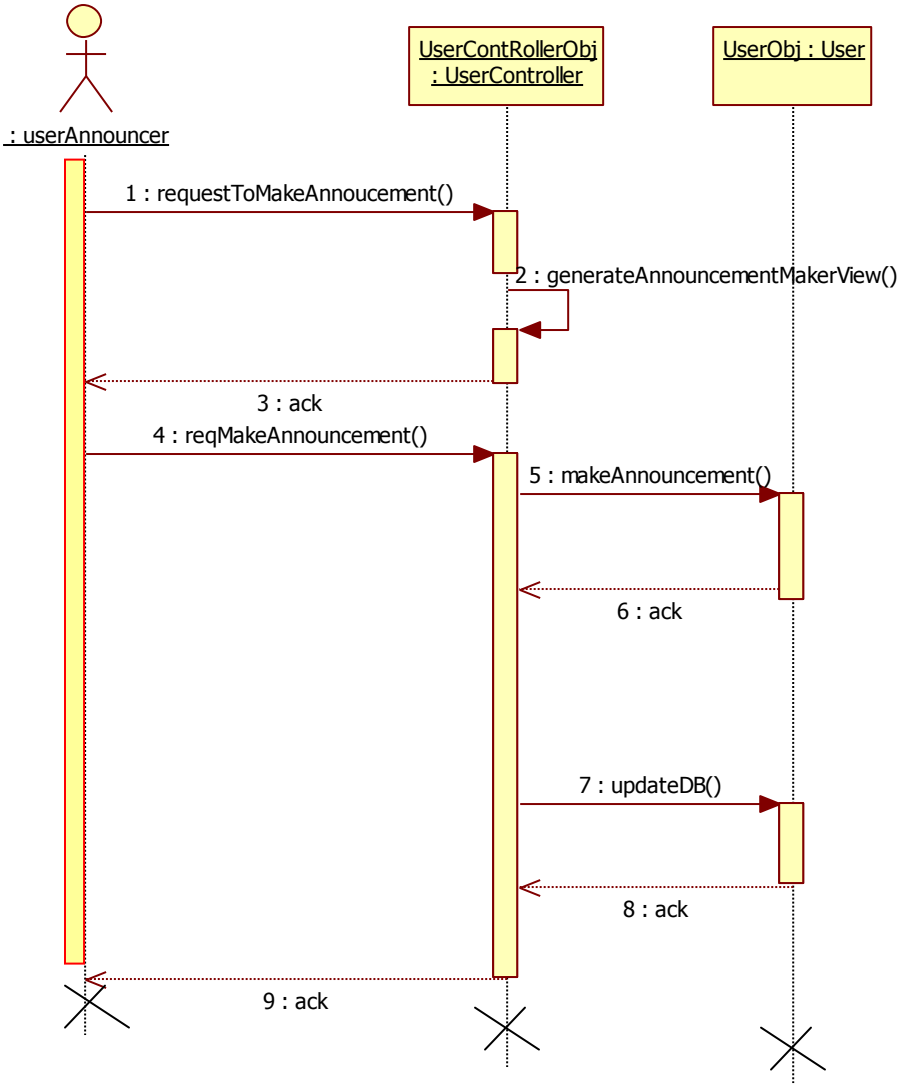
1. **Registration**



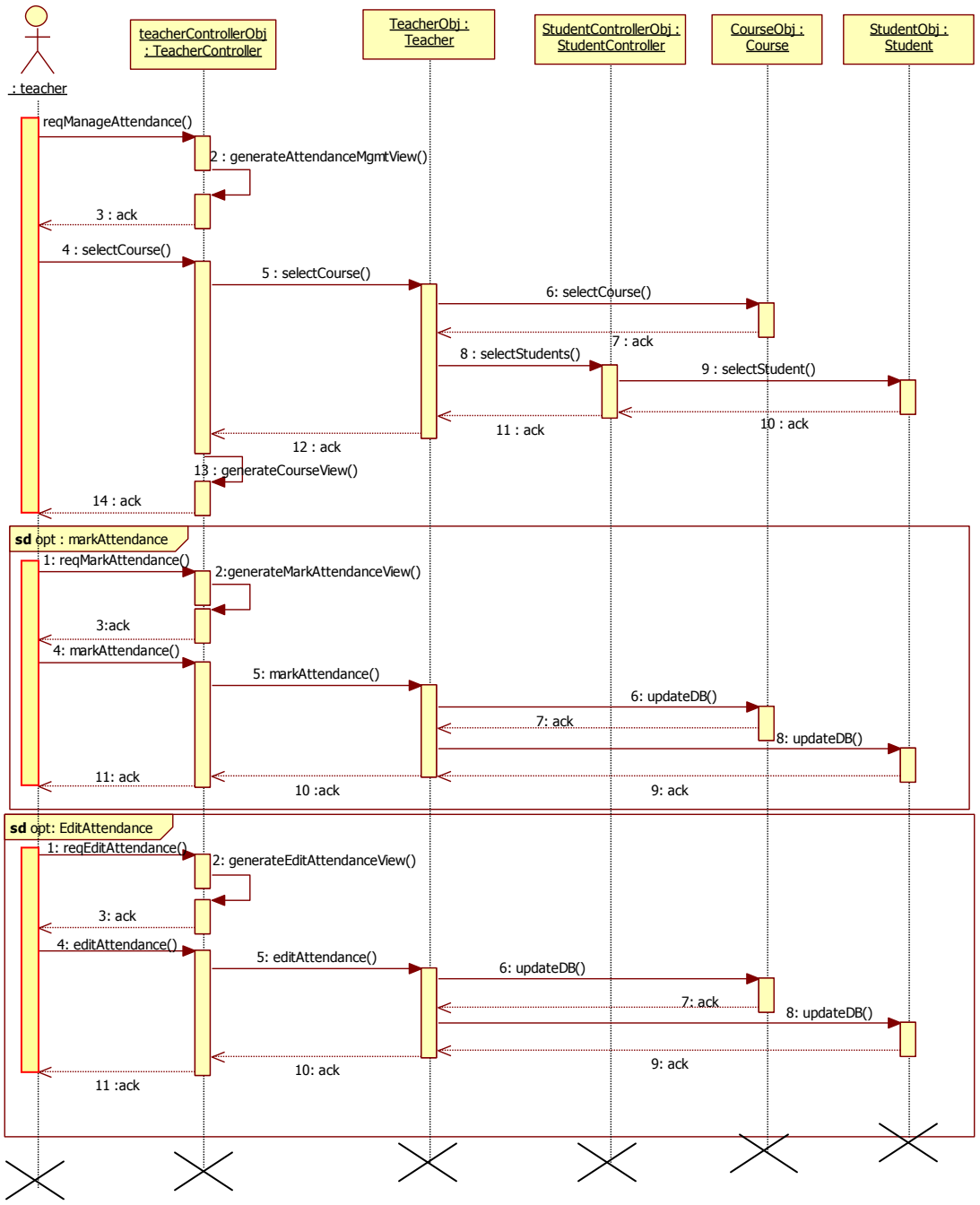
2. **Login**



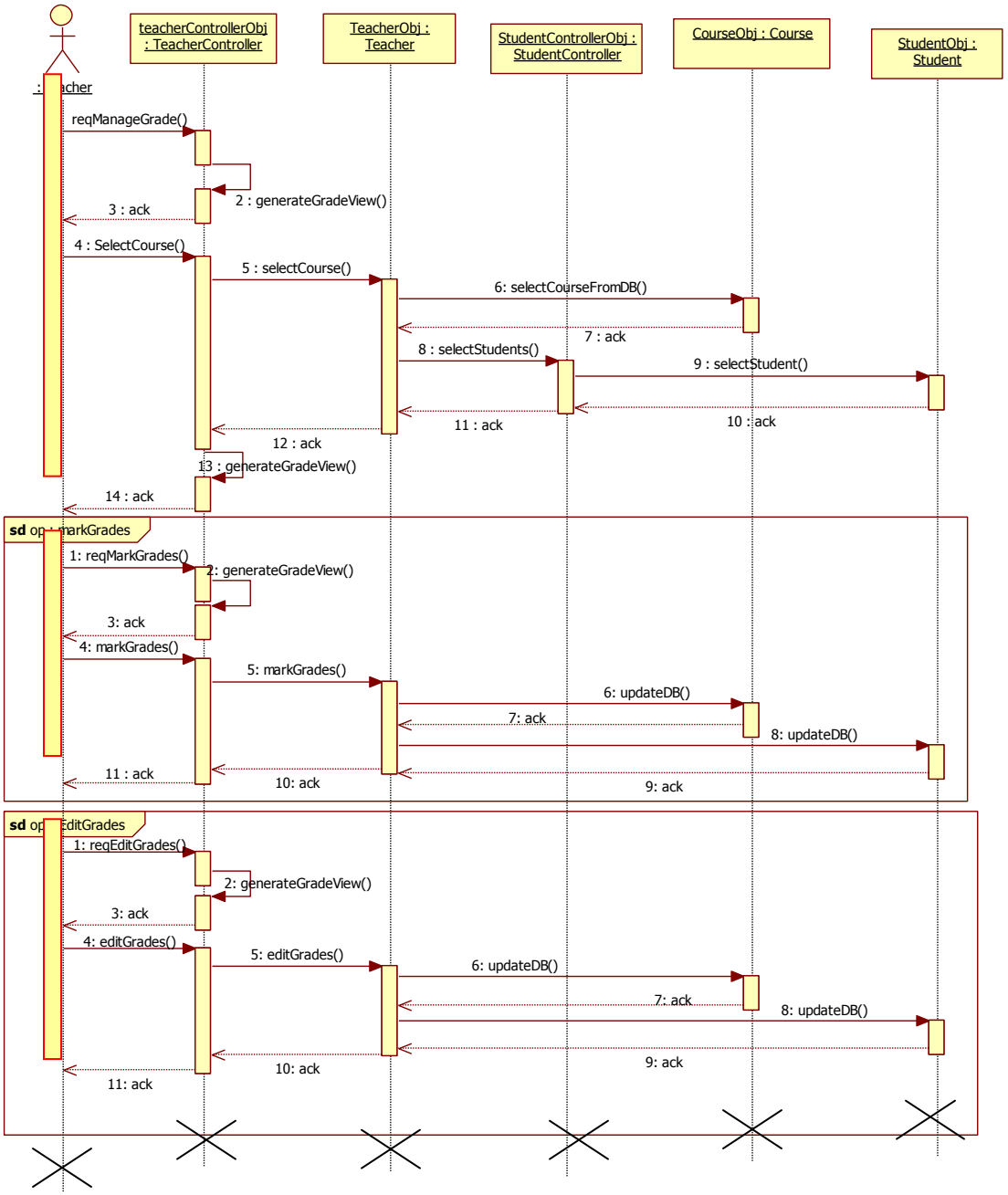
3. **Make Announcement**



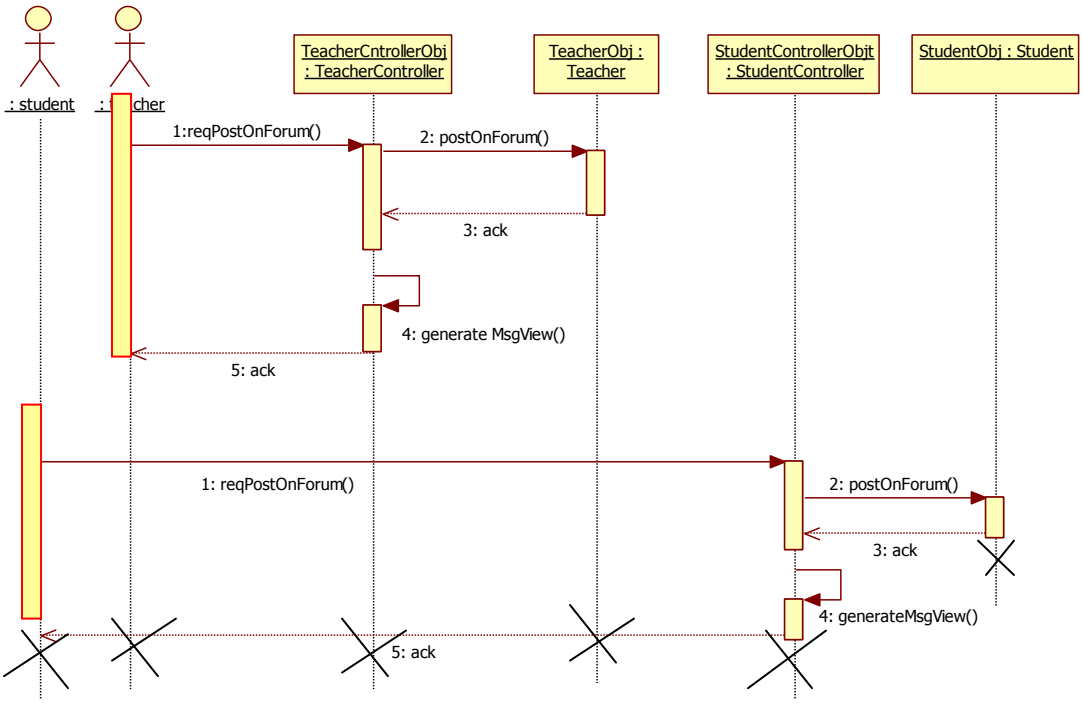
4. Manage Attendance



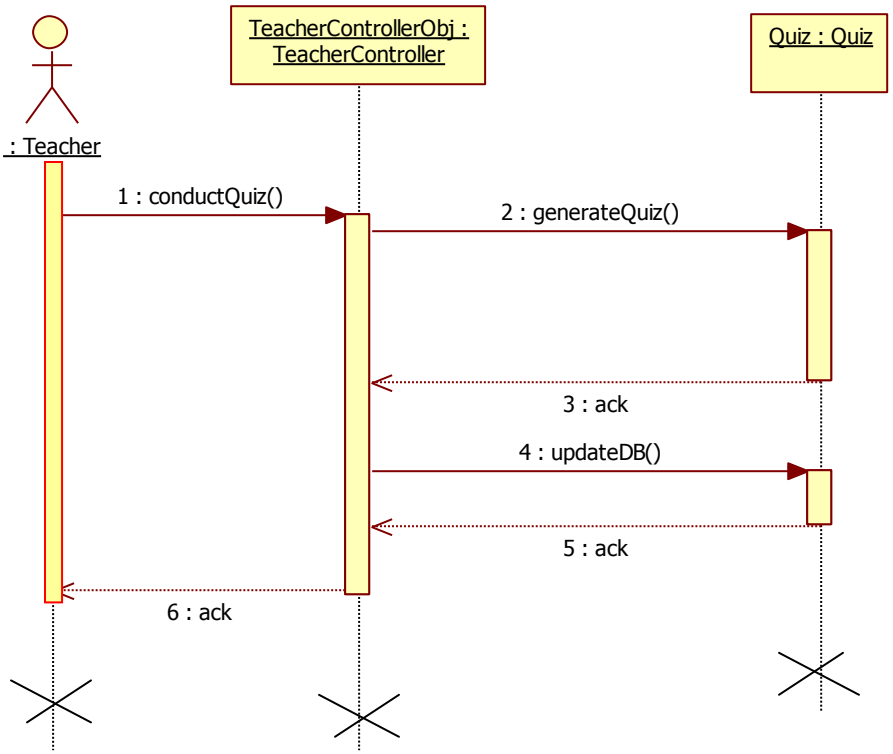
5. **Manage Grade**



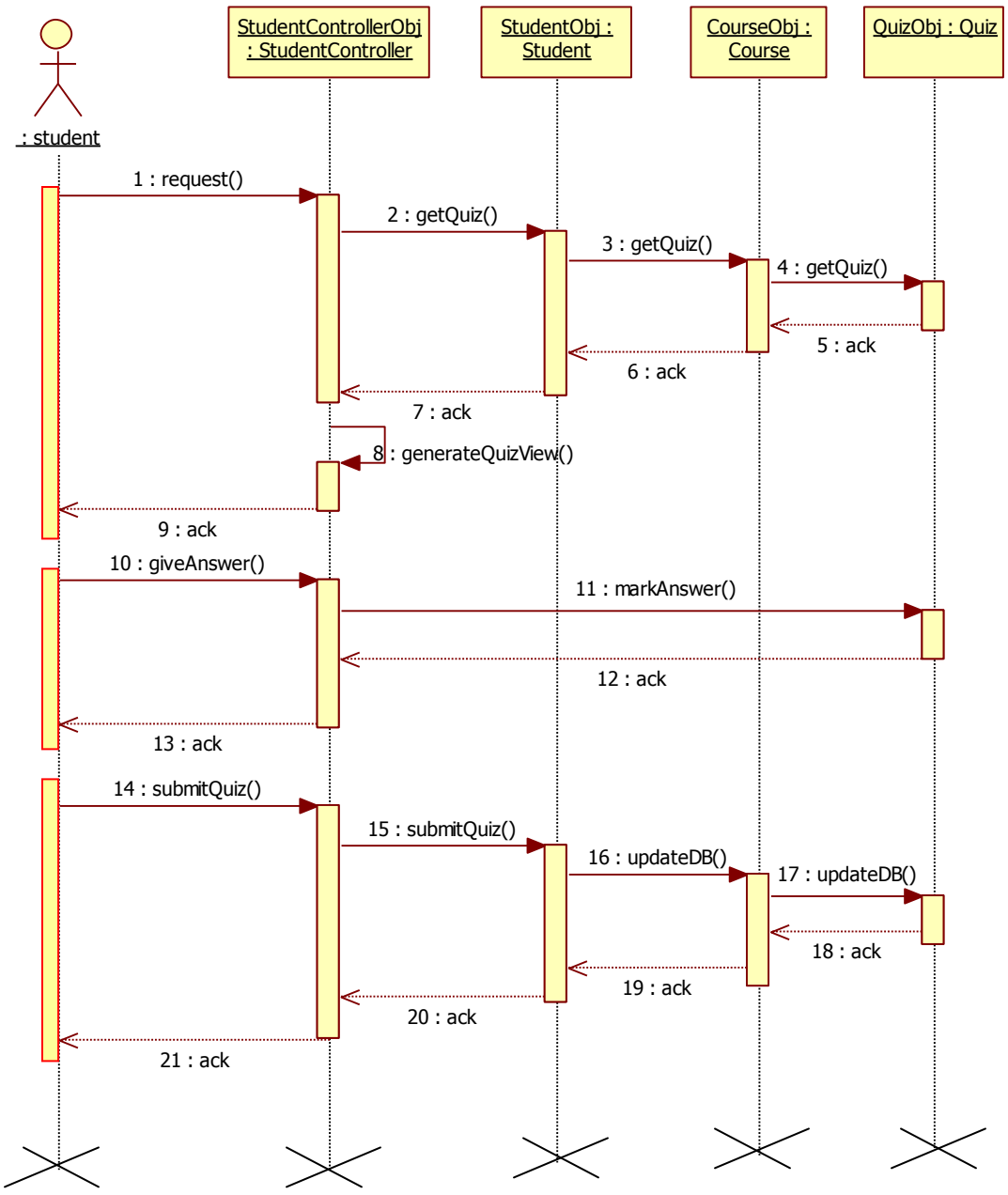
6. **Post on forum**



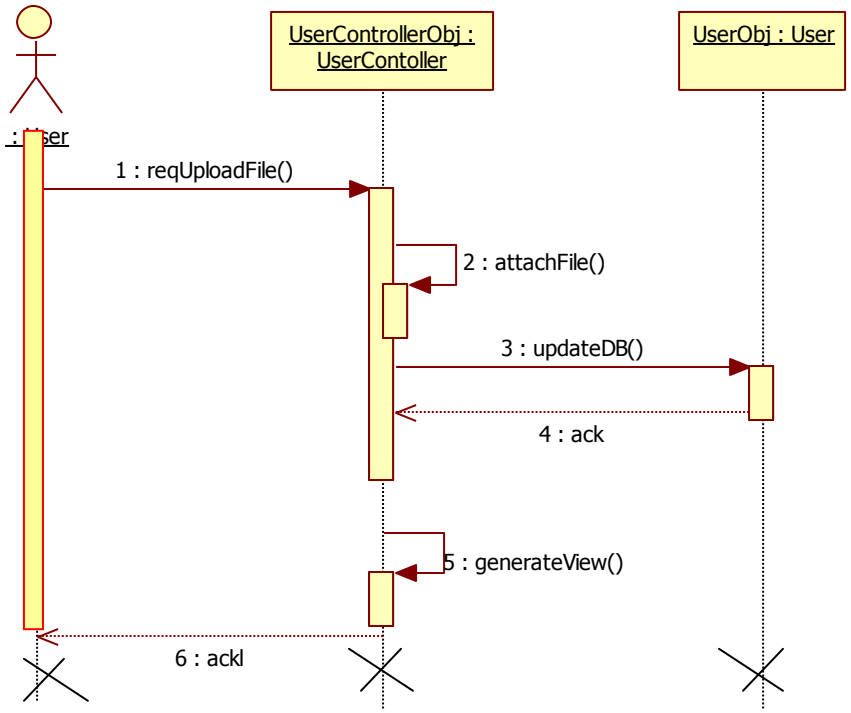
7. Conduct Quiz



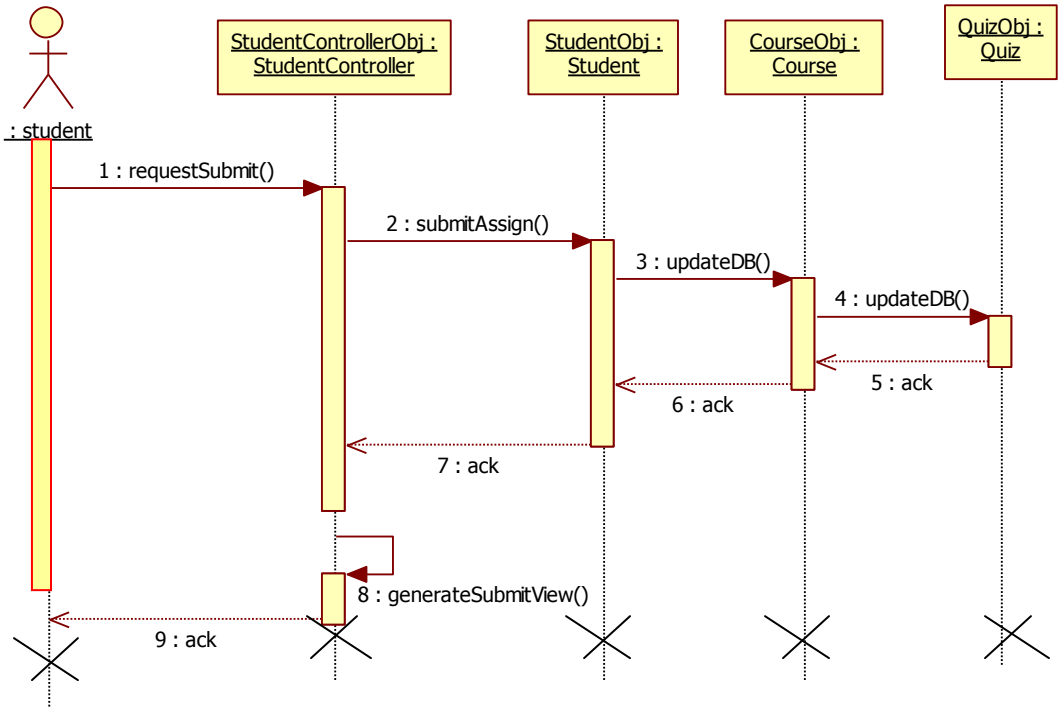
8. **Attempt Quiz**



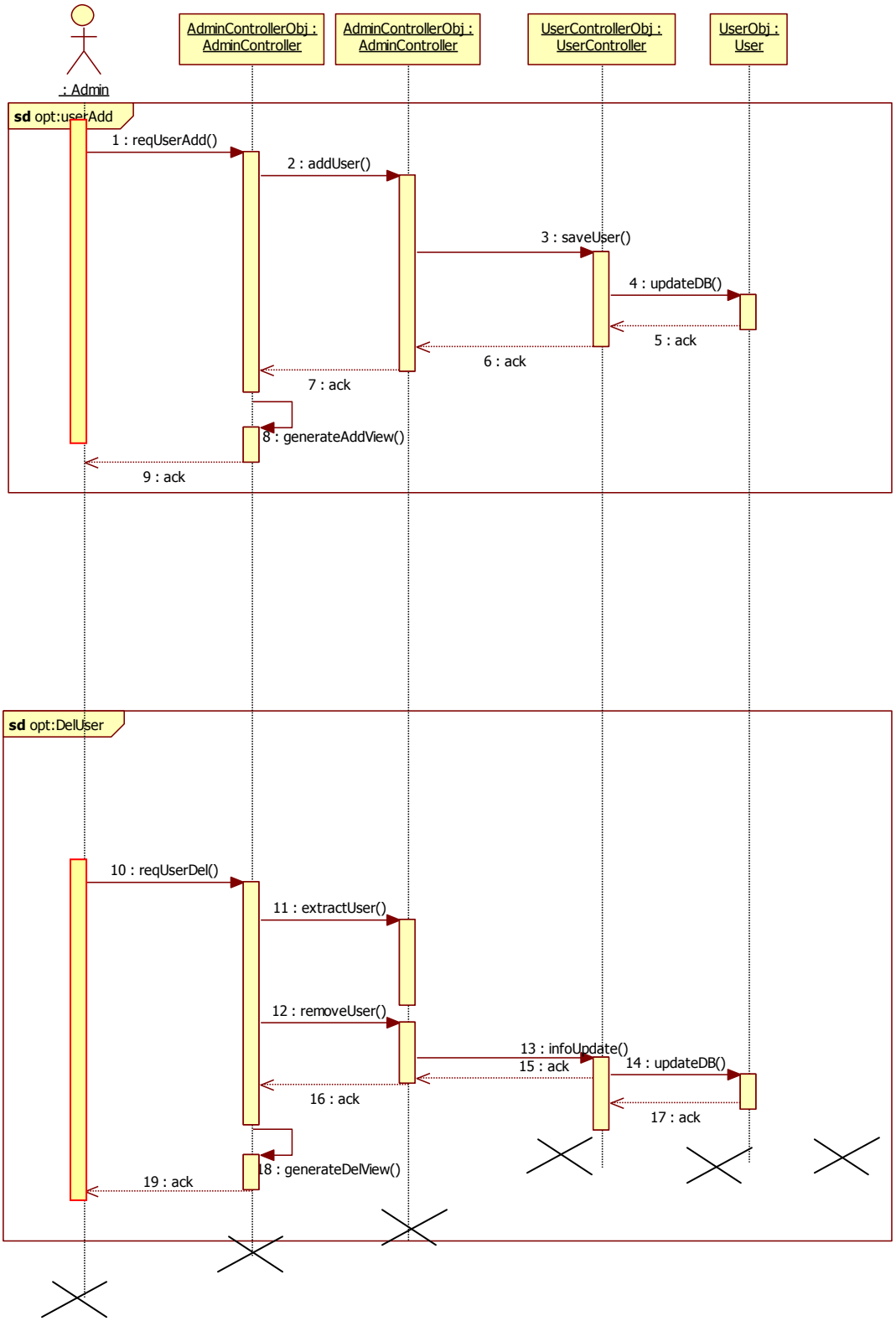
9. Upload File



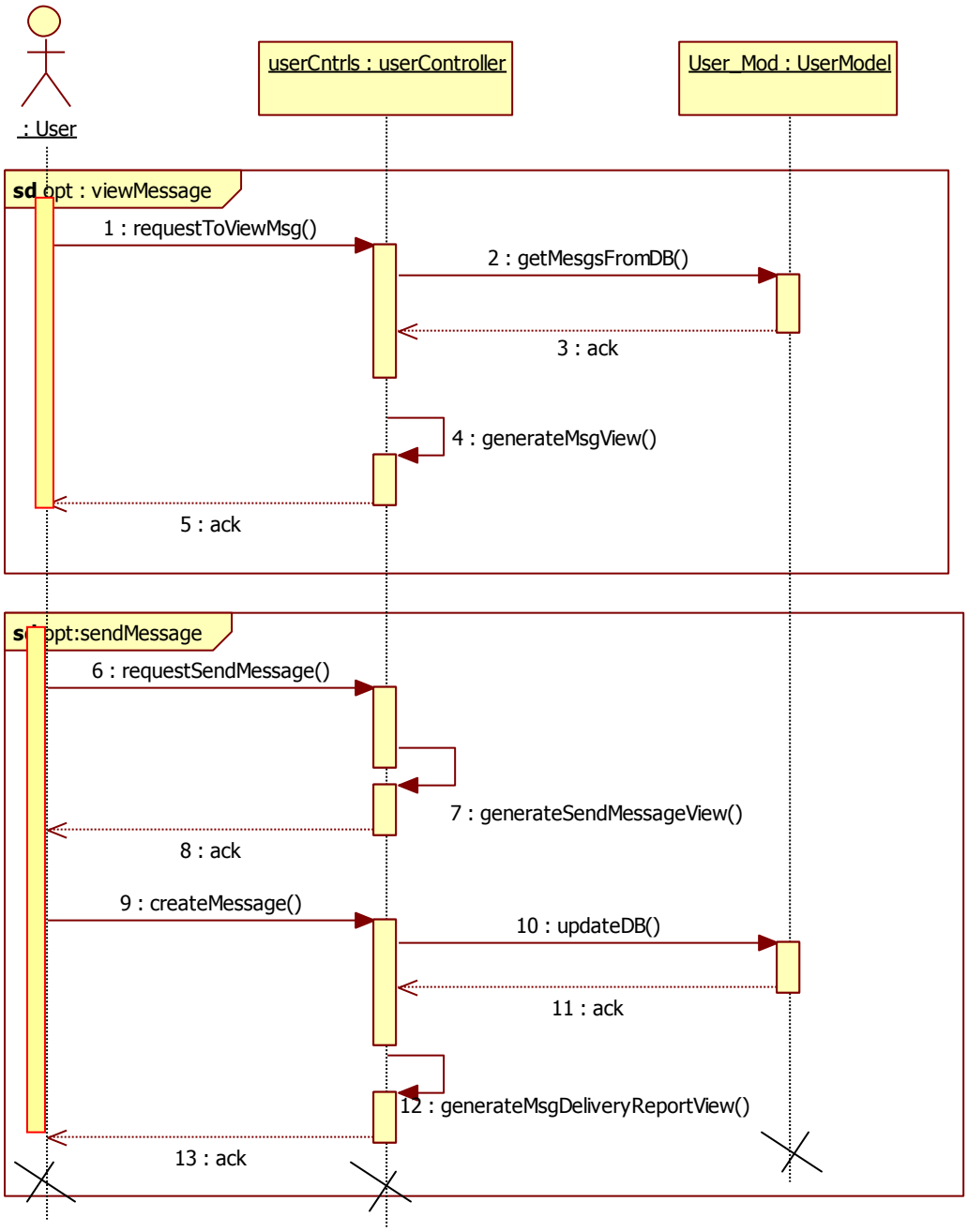
10. **Submit Assignment**



11.**Manage User**

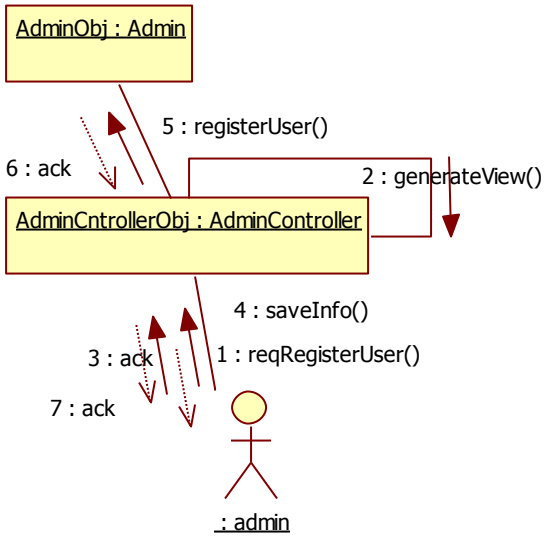


12. **Manage Messages**

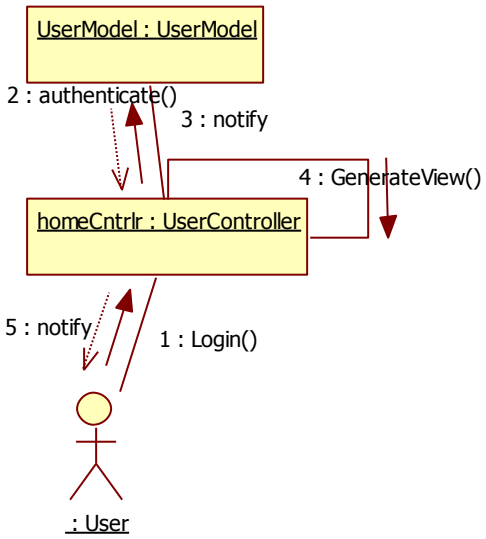


2.5 Collaboration Diagram

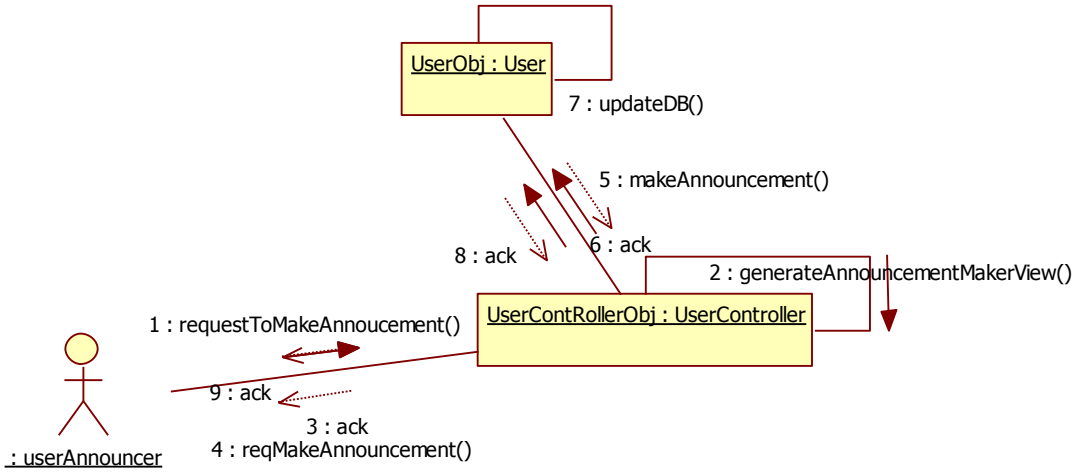
1. Register User



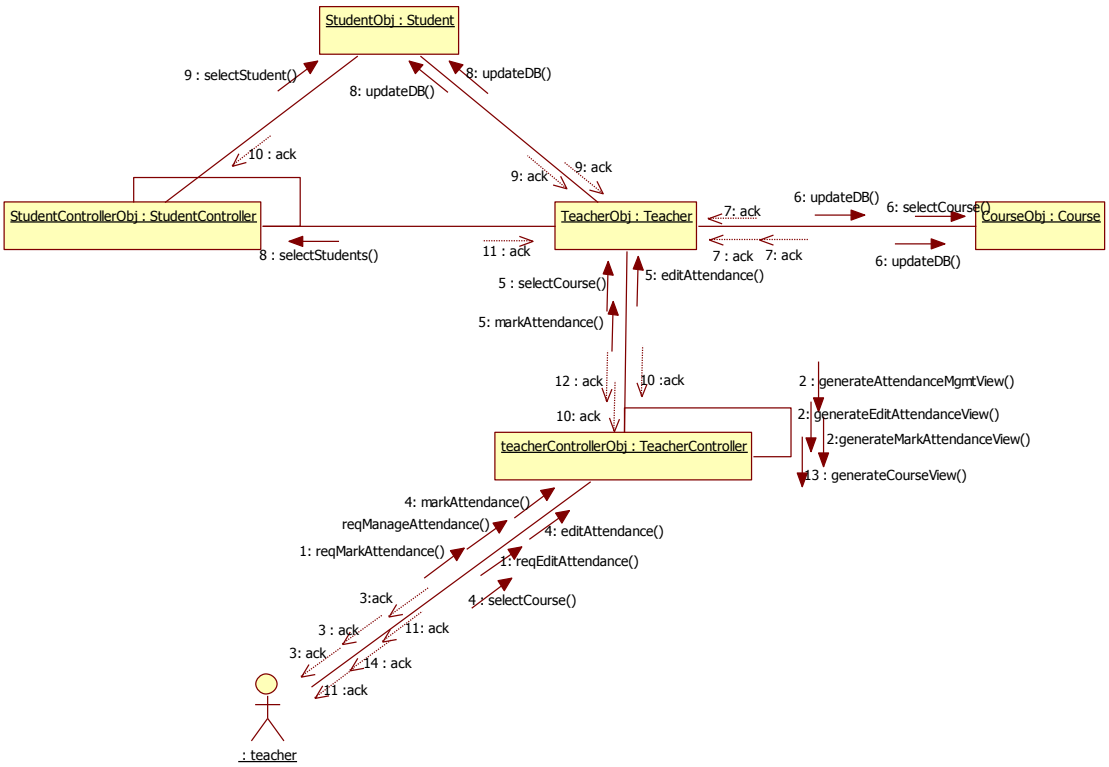
2. Login



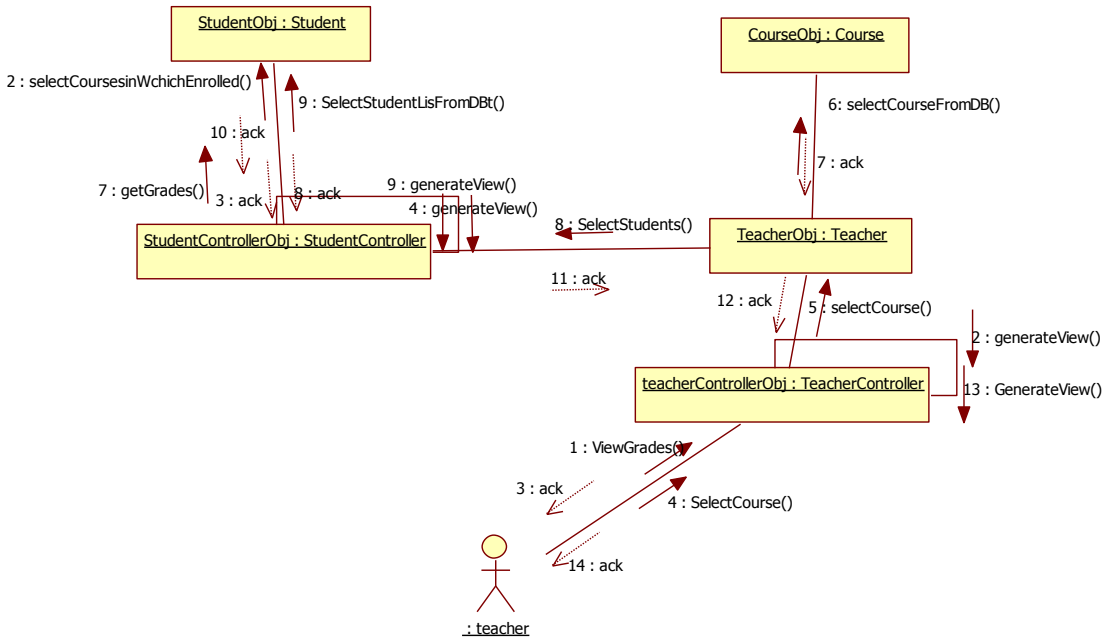
3. Make Announcement



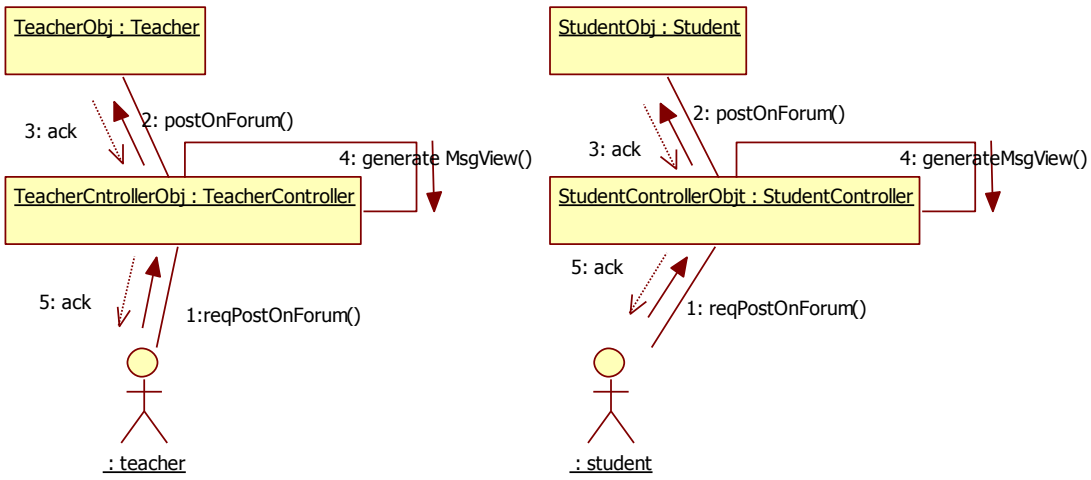
4. Manage Attendance



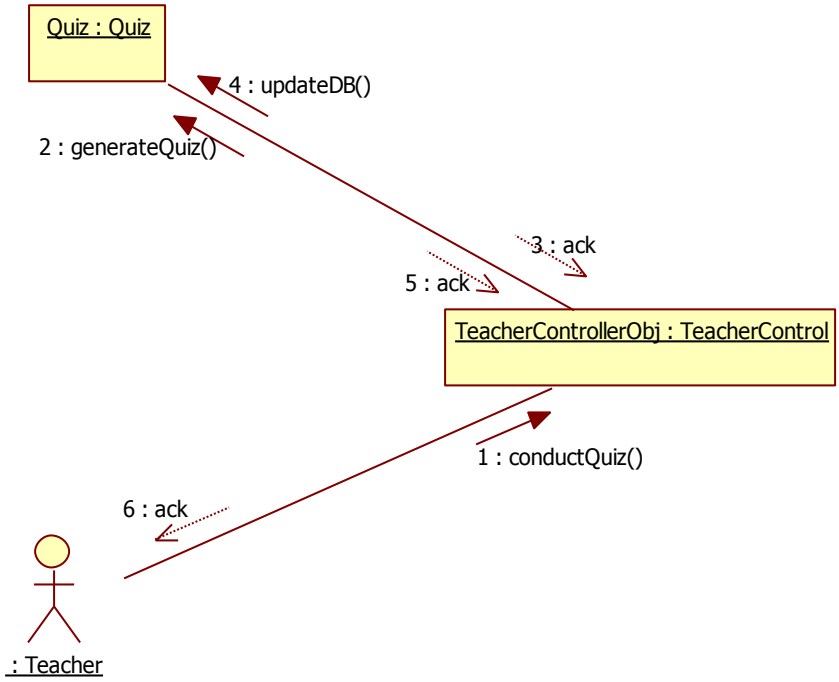
5. Manage Grades



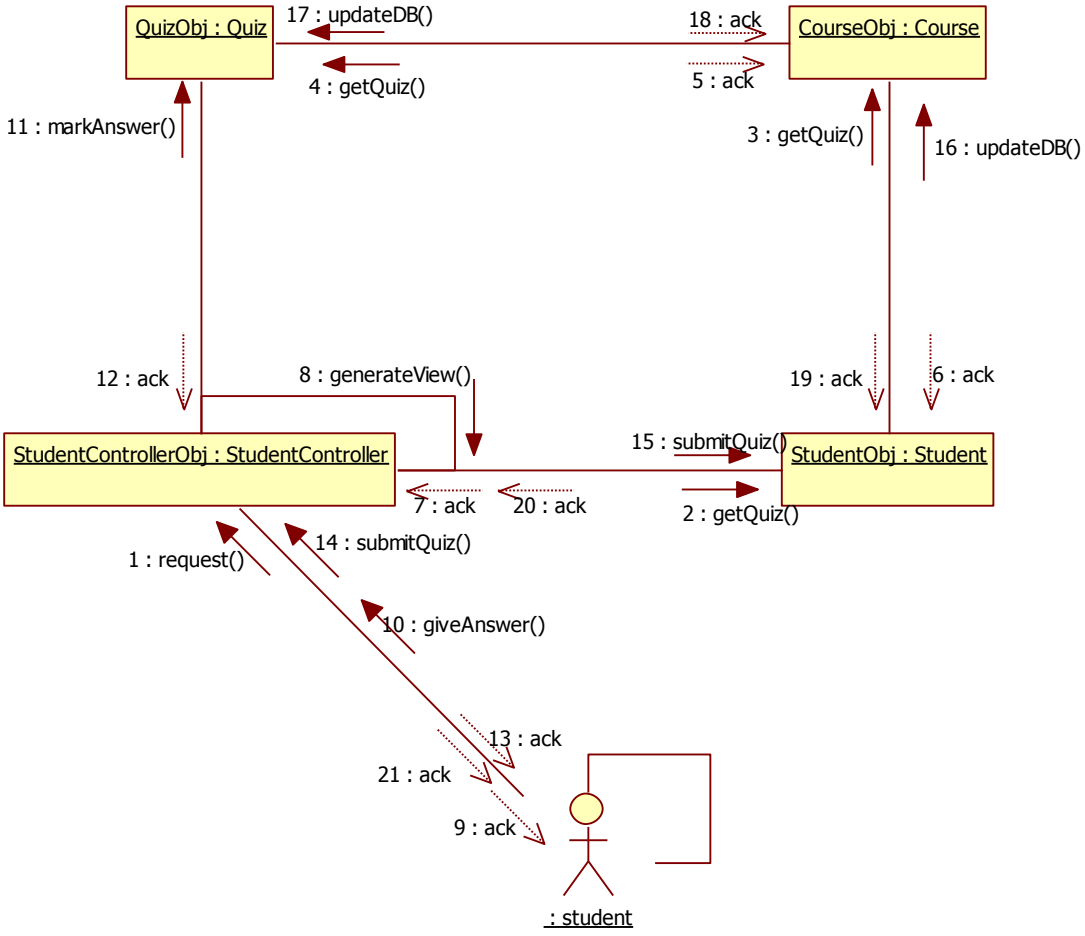
6. Post On Forum



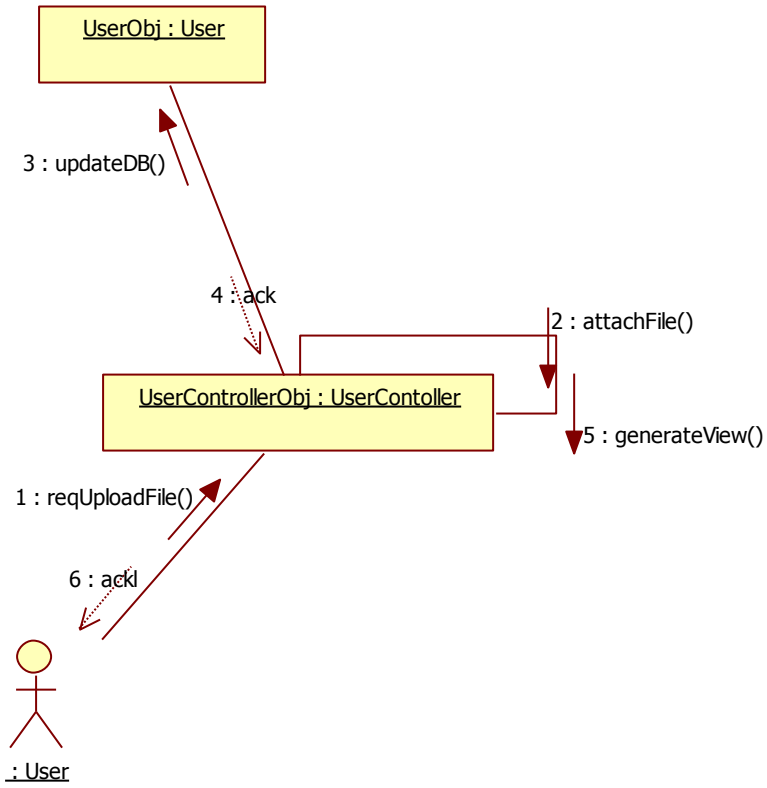
7. Conduct Quiz



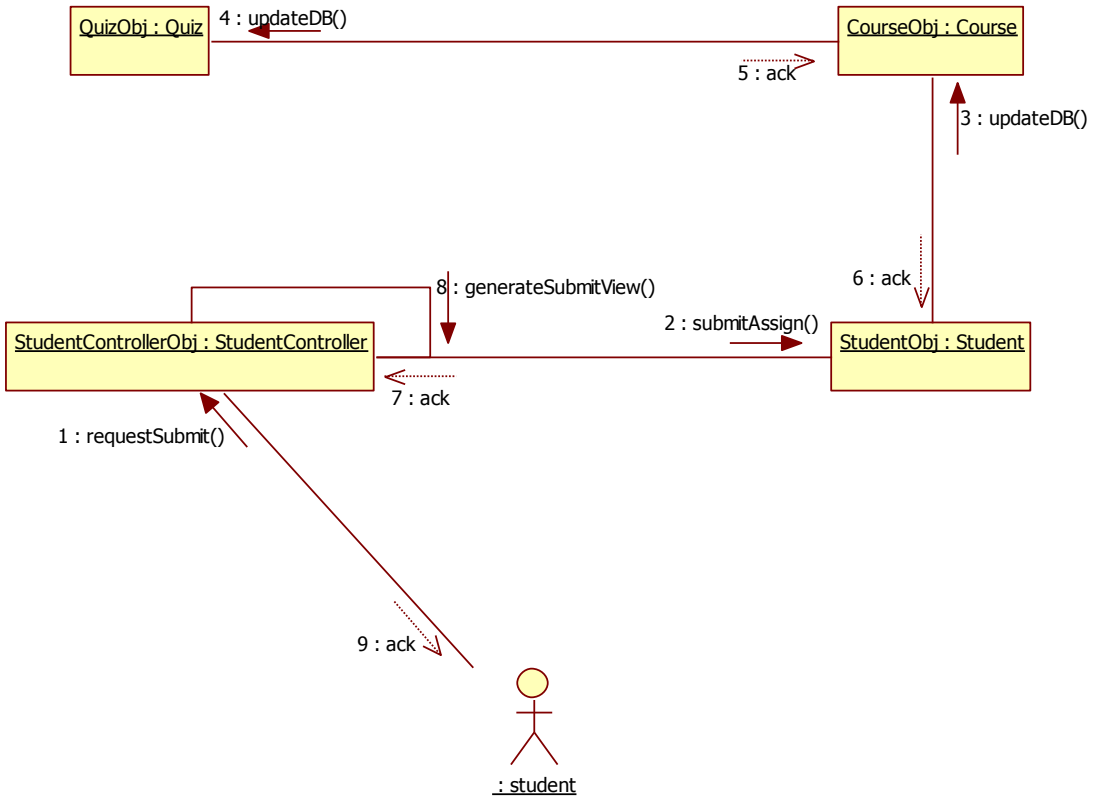
8. Attempt Quiz



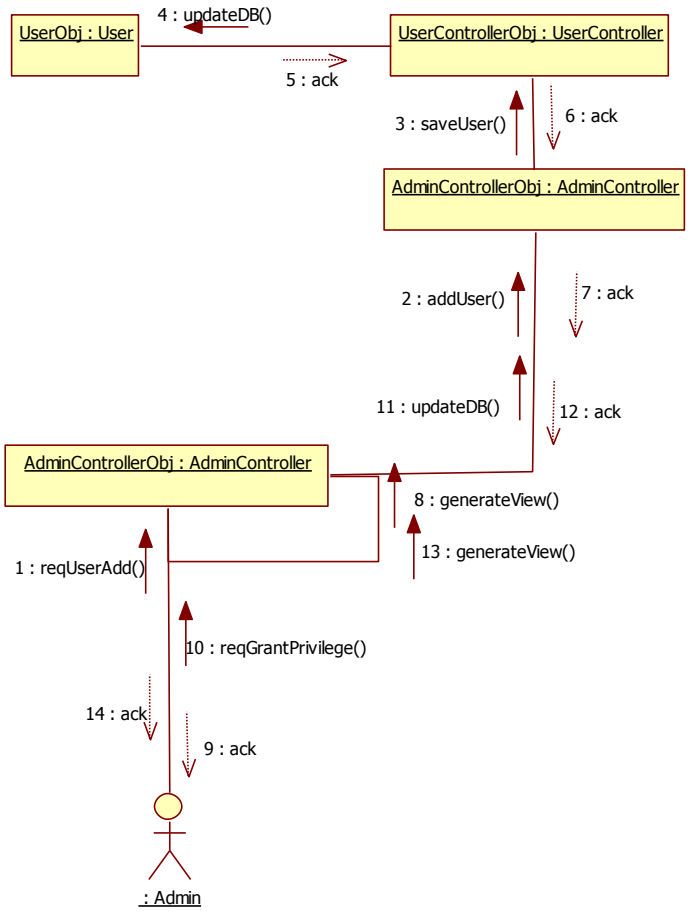
9. Upload Files



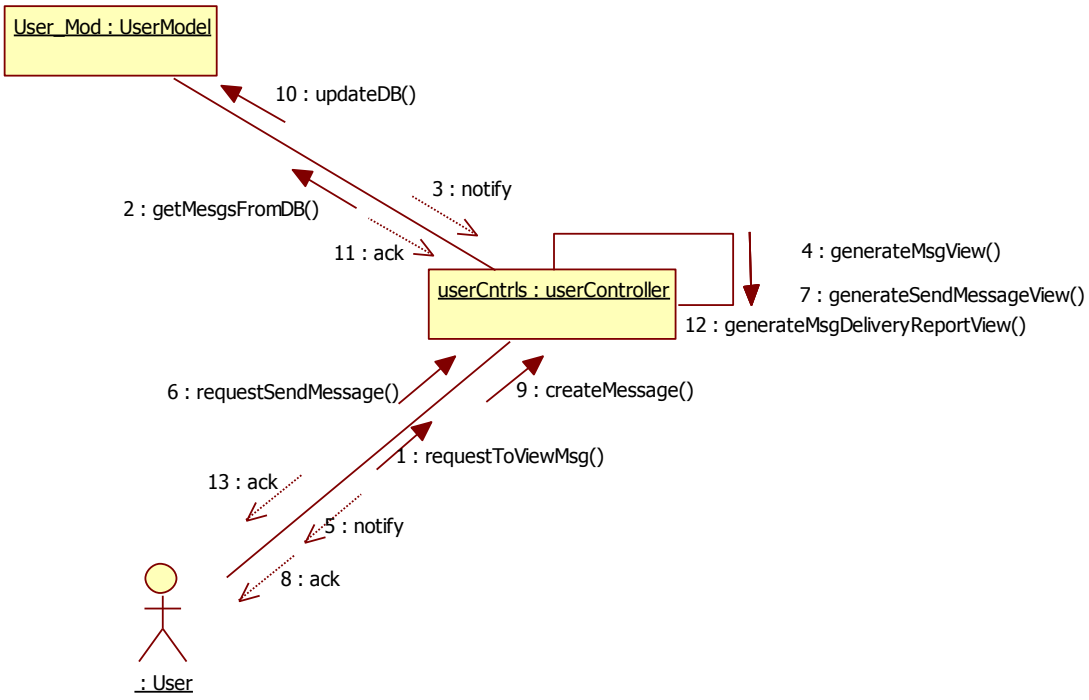
10.Submit Assignment



11.Manage User



12.Message Management



2.6 Operation Contracts

Operation Contract 01: Register User:

Name: RegisterUser()

Responsibilities:-

When a user want to interact with the system he/she firstly need to get registered in the system. System Admin will register a user in the system. Once user is registered successfully then this user-registered information is used to authenticate the user to allow his interaction with the system.

Cross Reference: use case : RegisterUser

Exceptions: none

Pre-condition:

Admin has been given privileges.

Post-condition:

a. An association is formed between User Controller and User
b. Instances of "User" are formed.

Operation Contract 02: Login:

Name: Login()

Responsibilities:-

When a user wants to interact with the system he/she need to login the system. It will prompt user to enter his username and password , and the respective view will be sent back in reply after validation of user. In this way, user can get the relevant contents of system.

Cross Reference: use case : Login

Exceptions: none

Pre-condition:

User was identified and authenticated.

Post-condition:

a. An association is formed between User Controller and User
b. Instances of “User” are formed.

Operation Contract 03 : Make Announcement:

Name: MakeAnnouncement()

Responsibilities:-

When an announcer (Teacher, Program Coordinator, Custom user) want to make announcement to some targeted audience, announcer first request to make announcement mention the targeted audience to whom it is making this announcement and so the targeted audience get notified.

Cross Reference: use case: MakeAnnoucncement

Exceptions: none

Pre-condition:

User has login successfully and has selected the announcement option.

Post-condition:

a. An association is formed between User Controller and User
b. Instances of “User” are formed.

Operation Contract 04: Manage Attendance:

Name: ManageAttendance()

Responsibilities:-

When an announcer (Teacher, Program Coordinator, Custom user) want to make announcement to some targeted audience, announcer first request to make announcement mention the targeted audience to whom it is making this announcement and so the targeted audience get notified.

Cross Reference: use case: ManageAttendance

Exceptions: none

Pre-condition:

Teacher has been logged in successfully and selected any of the two options

i. Mark Attendance
ii. Edit Attendance

Post-condition:

a. An association is formed between User Controller and User
b. Instances of "User" are formed.

Operation Contract 05: Manage Grades:

Name: ManageGrades()

Responsibilities:-

It will allow the teacher to manage the grades of students enrolled in his courses, teacher will choose a course from the list of courses he is currently teaching, get the enrolled students list and mark their grades in respective course's activity, update the Grades and both student and teacher can view these grades.

Cross Reference: use case: ManageGrades

Exceptions: none

Pre-condition:

Teacher has been logged in successfully and selected any of the two options

iii. Mark Grades
iv. Edit Grades

Post-condition:

a. An association is formed between Teacher Controller and StudentController, Teacher, Course, Student.
b. An association is formed between Teacher and Course.
c. An association is formed between StudentController and Student.
d. Instances of "Teacher" "Student" and "Course" are formed.

Operation Contract 06: Post on Forum:

Name: PostOnForum()

Responsibilities:-

Student and Teacher will request to 'post on the forum' of the one they have forum membership. All the members of the forum will be able to view this post.

Cross Reference: use case: PostOnForum

Exceptions: none

Pre-condition:

Student and Teacher whoever is posting, is member of forum

Student and Teacher has been logged in successfully and selected to post on forum option.

Post-condition:

a. Association is formed between TeacherController,Teacher,StudentController and Student.
b. Instances of "Teacher" and "Student" are formed.

Operation Contract 07 : Conduct Quiz:

Name: ConductQuiz( )

Responsibilities:

It will allow the teacher to conduct the quiz. Teacher is registered in the class whom quiz he/she is willing to conduct, on teacher's request to conductQuiz a quiz will be generated from the Quizes saved in Quiz-Repository then Particular Quiz will be selected by teacher and its is updated in Quiz-Repository also acknowledged to teacher.

Cross Reference: use case : ConductQuiz

Exceptions: none

Pre-condition:

a. Teacher is registered in the course/class whose quiz he is taking
b. Teacher has been login to system.

Post-condition:

a. Association is formed between Teacher Controller, Quiz.
b. Instances of "TeacherController", "Quiz" are formed.

Operation Contract 08 : Attempt Quiz:

Name: AttemptQuiz( )

Responsibilities:

It will allow the student to attempt the quiz which his/her teacher of respective course has started. Firstly Student is registered and login, on teacher's request to conductQuiz, a quiz will be started. Student then will get this Started Quiz. Student then give Answers of the question , submit it and then database is updated.

Cross Reference: use case : AttemptQuiz

Exceptions: none

Pre-condition:

a. Student is registered in the course/class whose quiz he is taking
b. Student has been login to system.
c. Teacher of that course/class has started the quiz.

Post-condition:

a. Association is formed between Teacher Controller , Quiz.
b. Instances of "TeacherController", "Quiz" are formed.

Operation Contract 09 : Upload Files:

Name: UploadFiles( )

Responsibilities:

Any user wants to upload file, he/she requests the userController to upload the file, attaches the file then database is updated. Finally user is also acknowledged with the progress of his fileupload.

Cross Reference: use case: UploadFiles

Exceptions: none

Pre-condition:

User has been login to system.

Post-condition:

a. Association is formed between UserController , User.
b. Instances of “UserController” and “User” are formed.

Operation Contract 10 : Submit Assignment:

Name: SubmitAssignment( )

Responsibilities:

It will allow the student to submit the assignment which his/her teacher of respective course has started. Firstly Student is registered and login, Student requests to submit his/her assignment, database is updated and submission report is acknowledged to the student.

Cross Reference: use case : SubmitAssignment

Exceptions: none

Pre-condition:

a. Teacher has uploaded the assignment.
b. Student has been log in to system.

Post-condition:

a. Association is formed between Student Controller, Student and Course.
b. Instances of “StudentController”, “Student” and “Course” are formed.

Operation Contract 12: Manage User:

Name: ManageUser( )

Responsibilities:

It will manage the user by providing three options.

i. User add
ii. Grant Previlleges (user type)
iii. Delete User

In User Add, it will add new custom user, grant Privileges to this new user. Then this info is saved in the system and updated in database. A User in the system can perform action accordingly to his privileges-set in system. A user also can be deleted and this information is also updated in the system.

Cross Reference: use case: Manage User

Exceptions: none

Pre-condition:

Admin logins the system

Admin adds the new user.

User logins the system.

Post-condition:

a. Association is formed between CustomController, Privilege, UserController and User.
b. Instances of “UserController”, “Privilege”, “UserController” and “User” are created.

Operation Contract 13: Manage Message:

Name: ManageMessage( )

Responsibilities:

It will allow the user to manage his messages. User can View and Send Messages. To view the messages It will extract the user-relevant messages from repository. When user want to send message, userController calls createsMessage and then this message is sent to the recipient , updated in repository and message delivery-report view is Acknowledged to the sender user.

Cross Reference: use case : ManageMessage

Exceptions: none

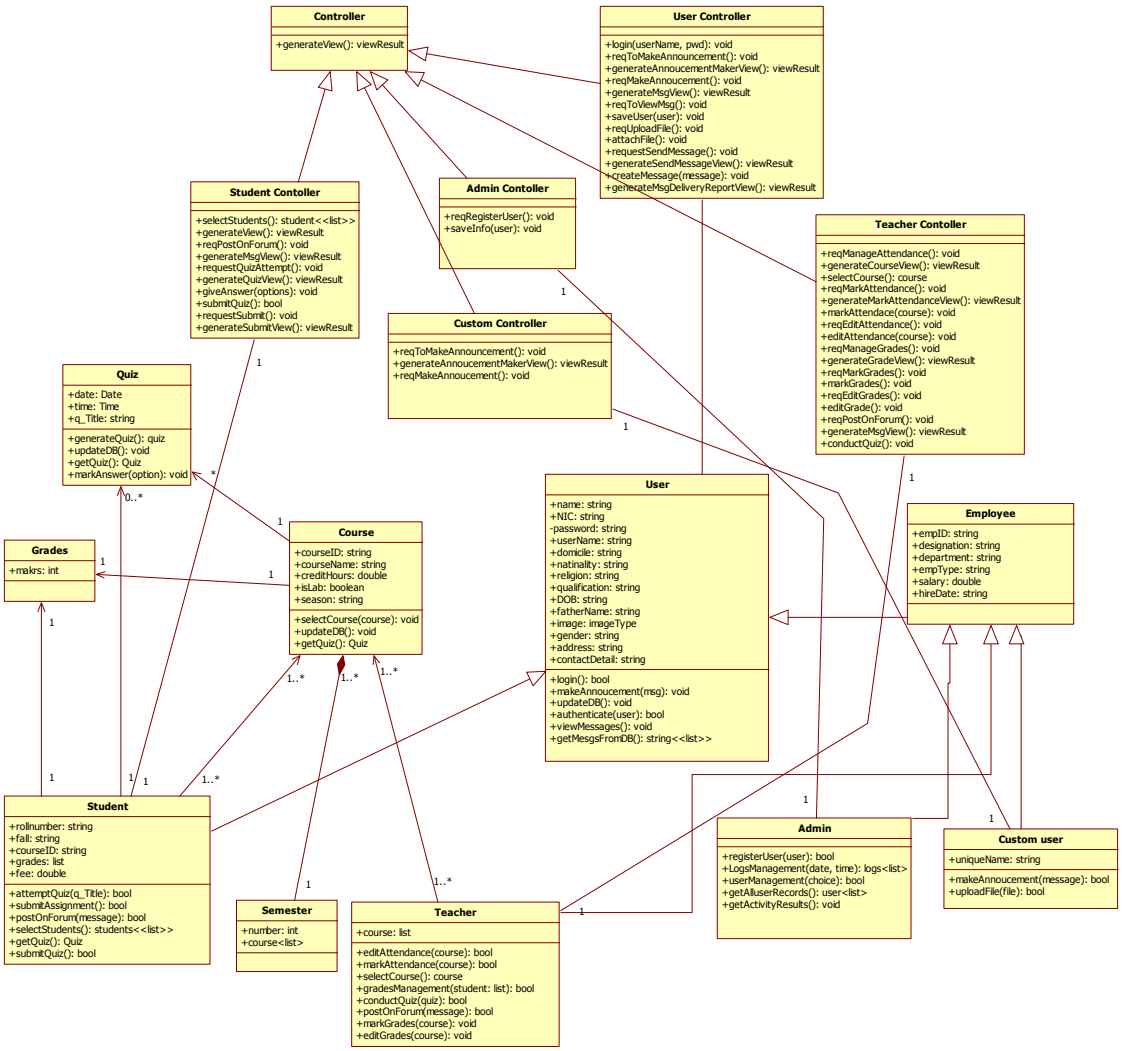
Pre-condition:

User login the system.

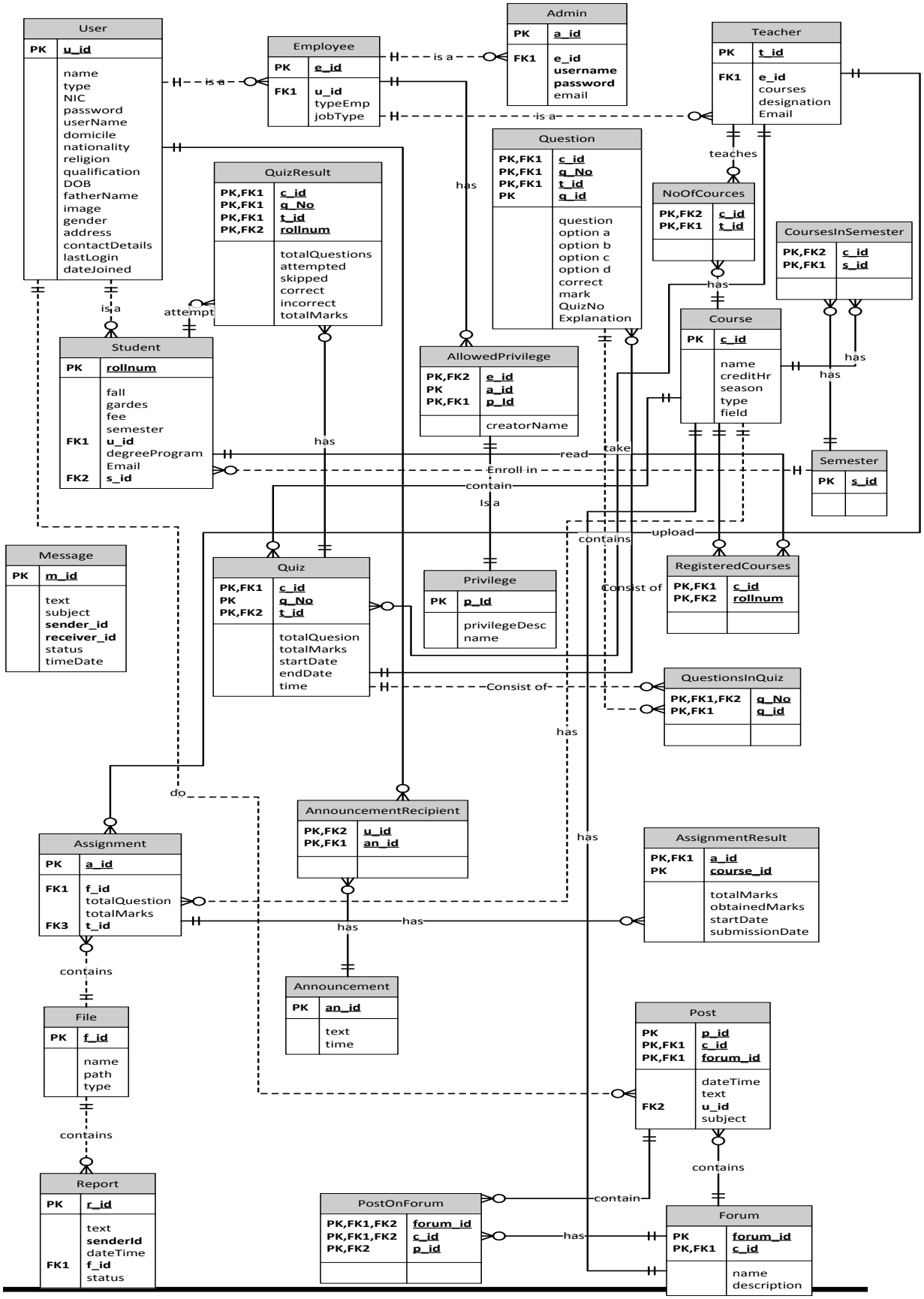
Post-condition:

a. Association is formed between UserController and User.
b. Instances of “UserController” and “User” are created.

1.7 Design Class Diagram



1.8 Data Model



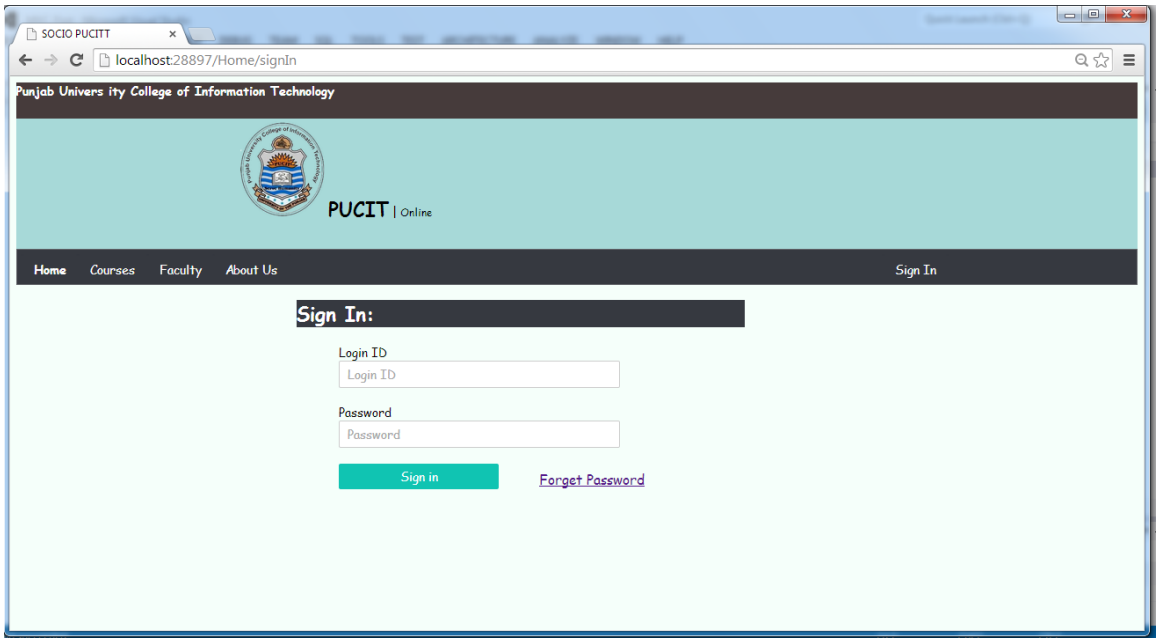
Chapter No 3

User Manual

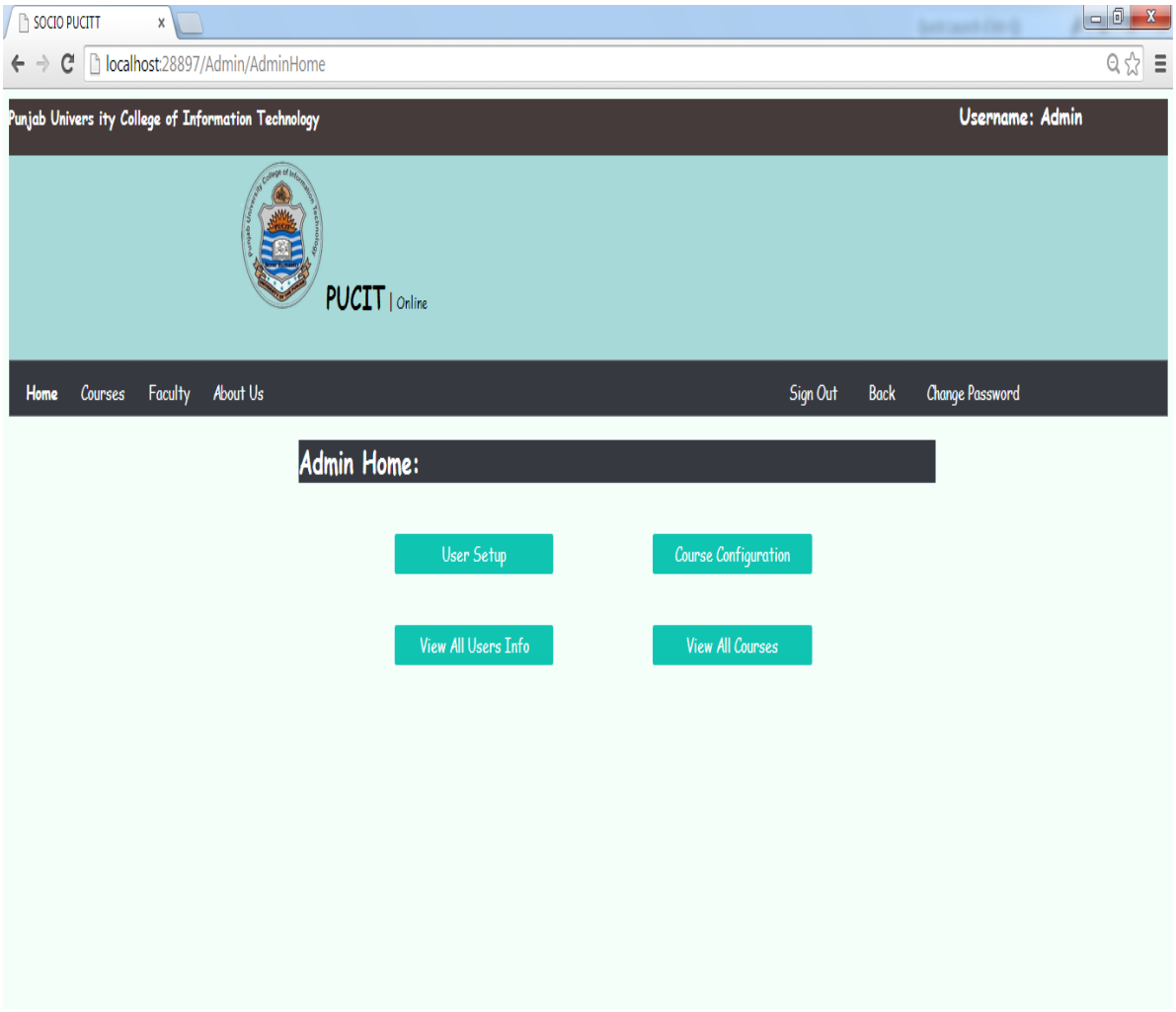
Screenshots:

Following are the screenshots of system SocioPUCIT for sake of user help.

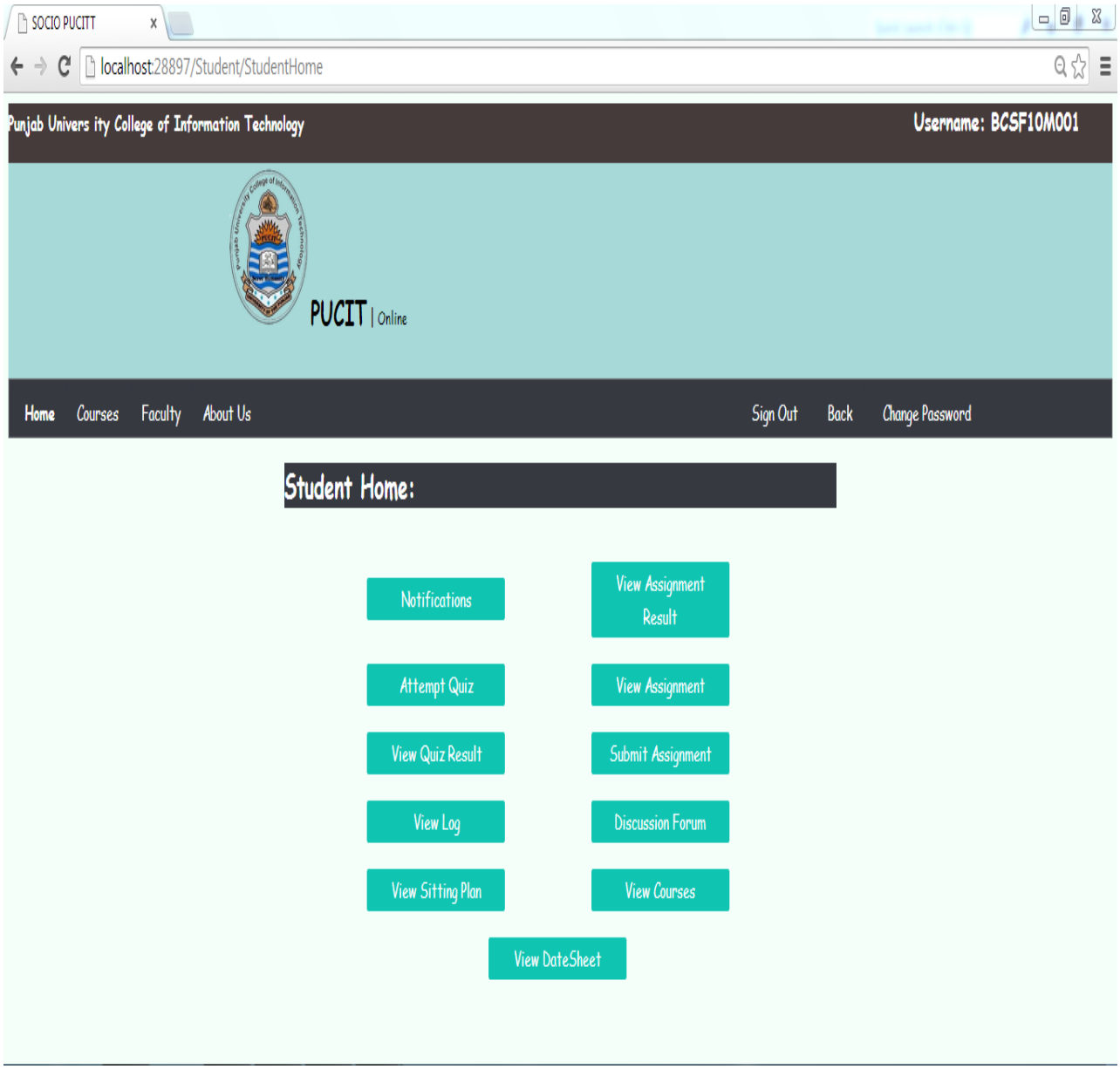
Login :-



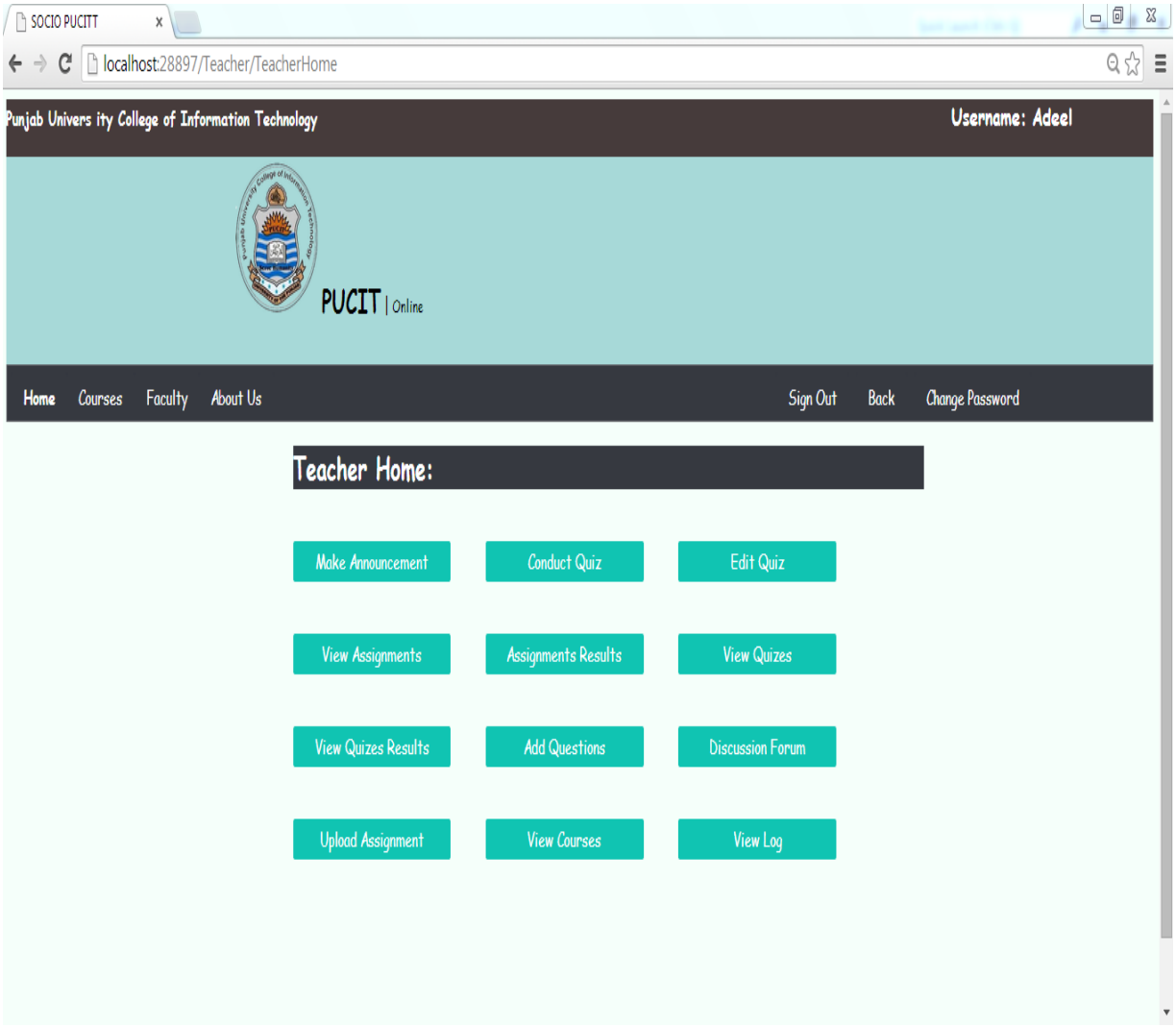
Admin Home :-



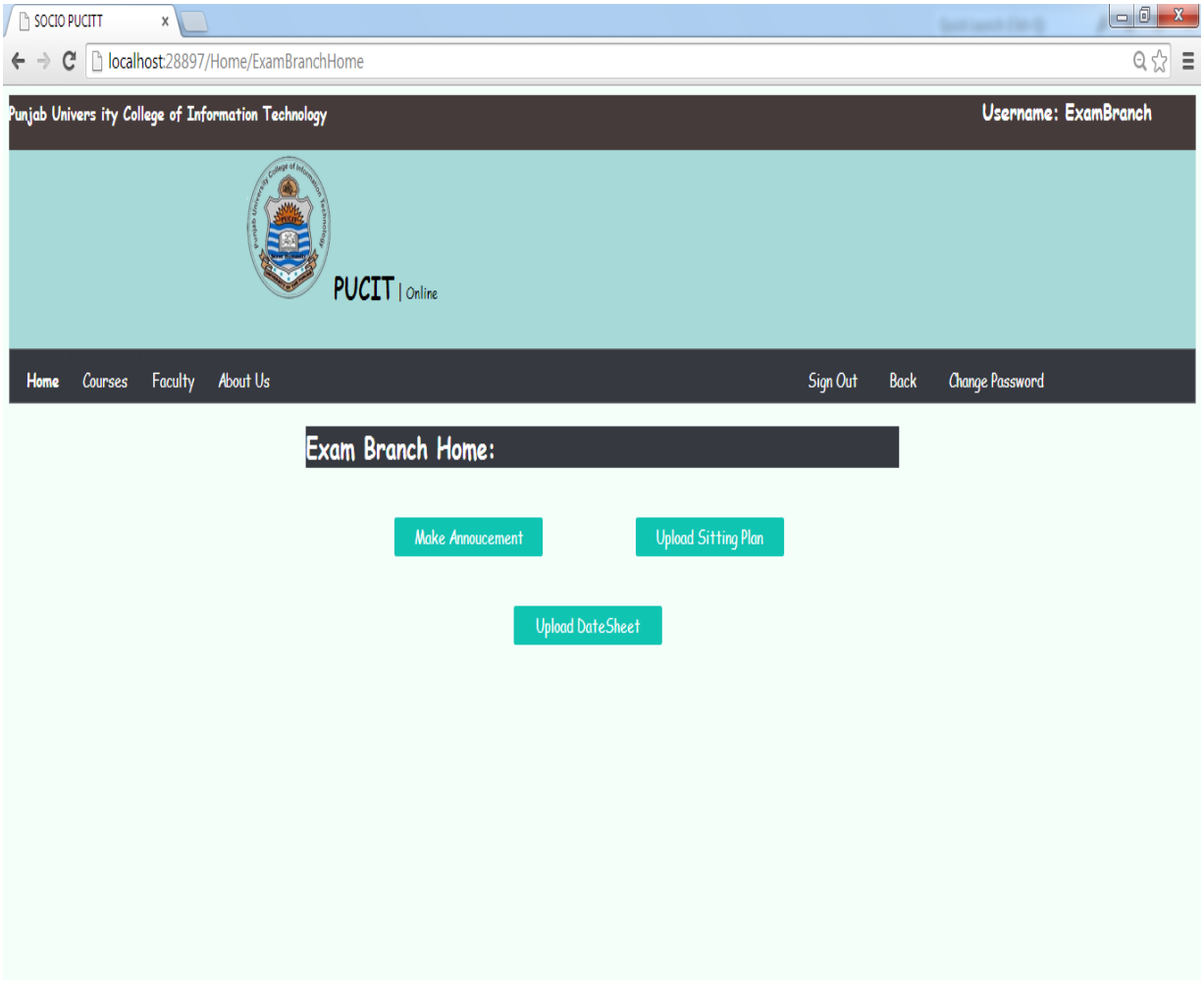
Student Home:-



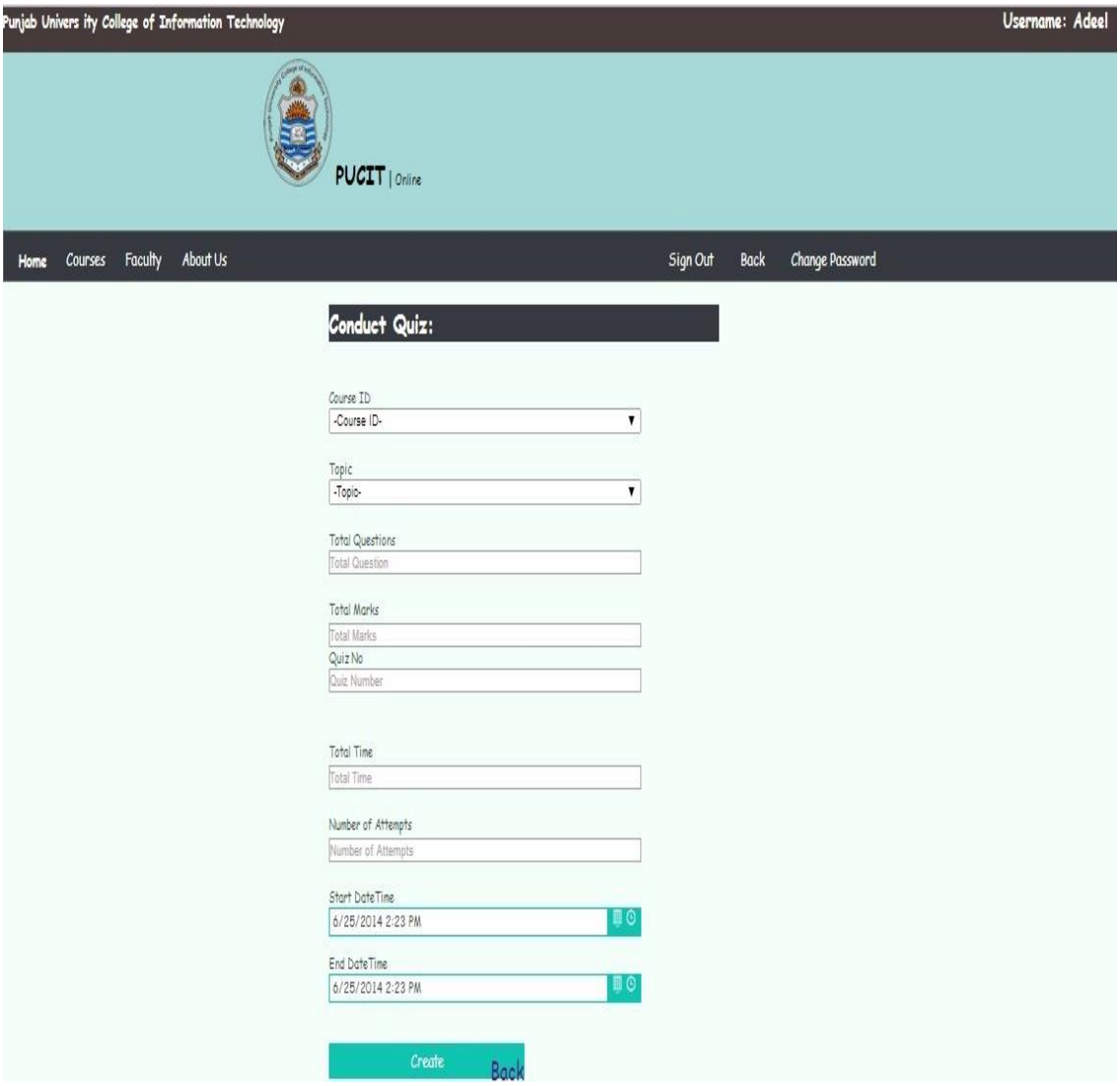
Teacher Home:-



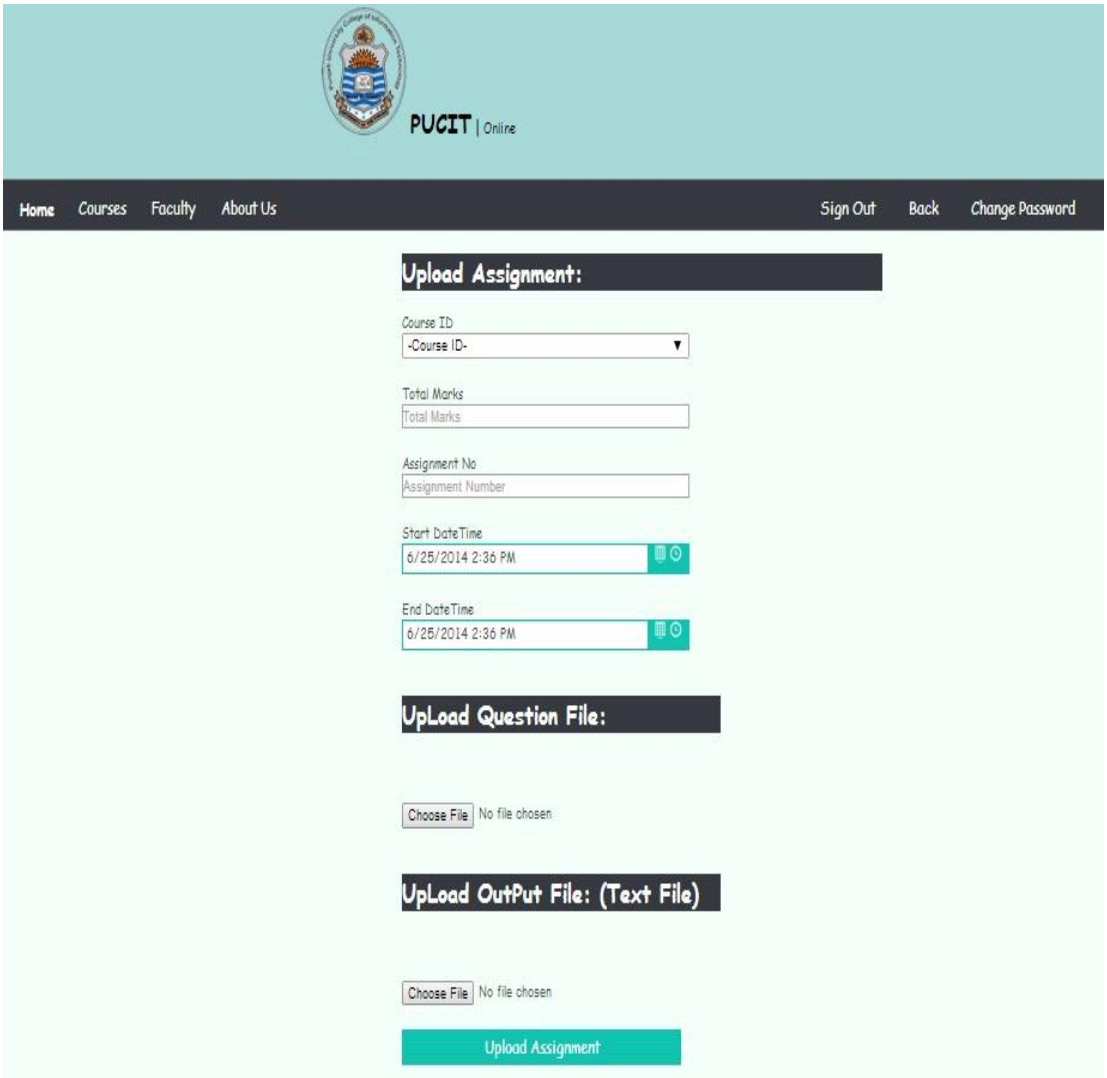
Exam Branch:-



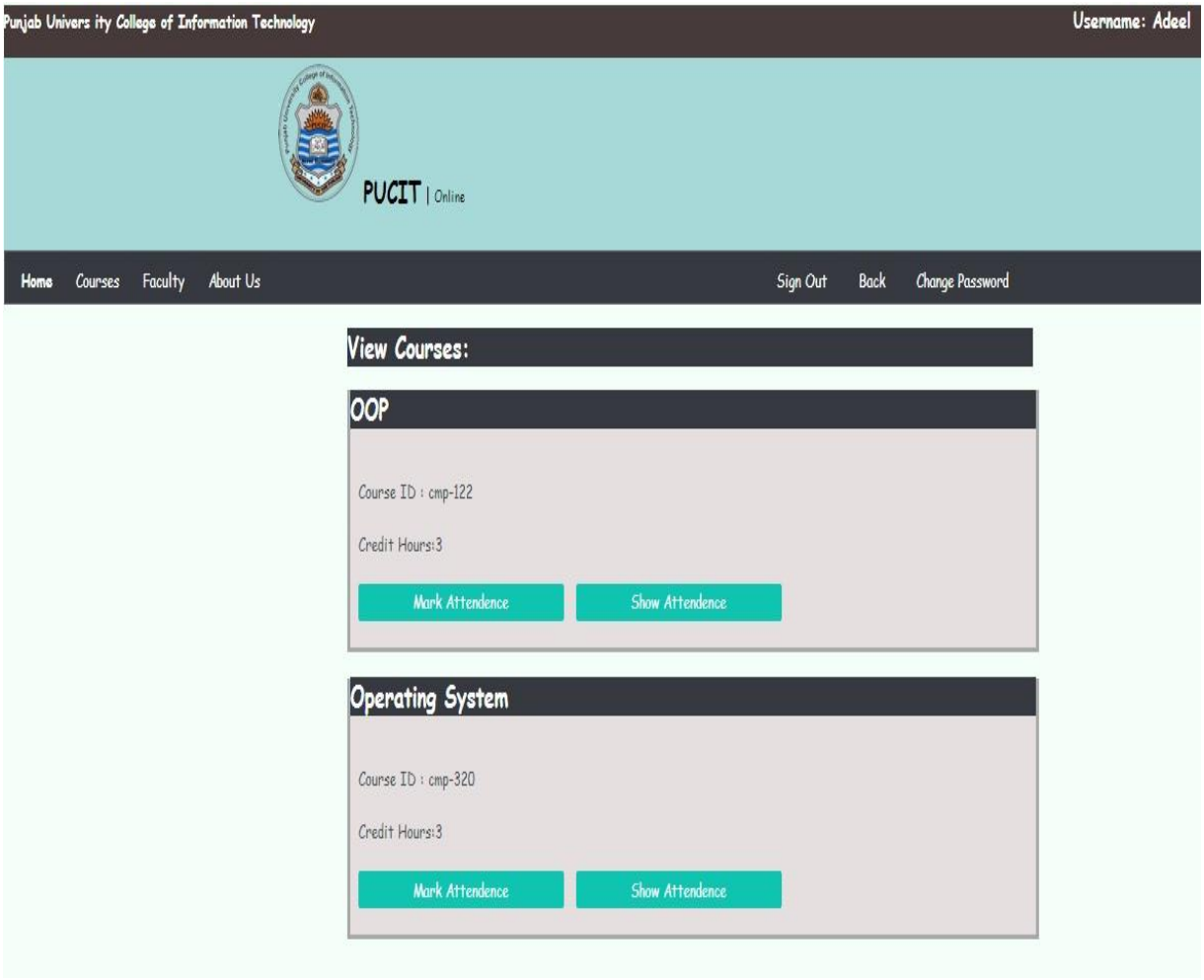
Conduct Quiz:-



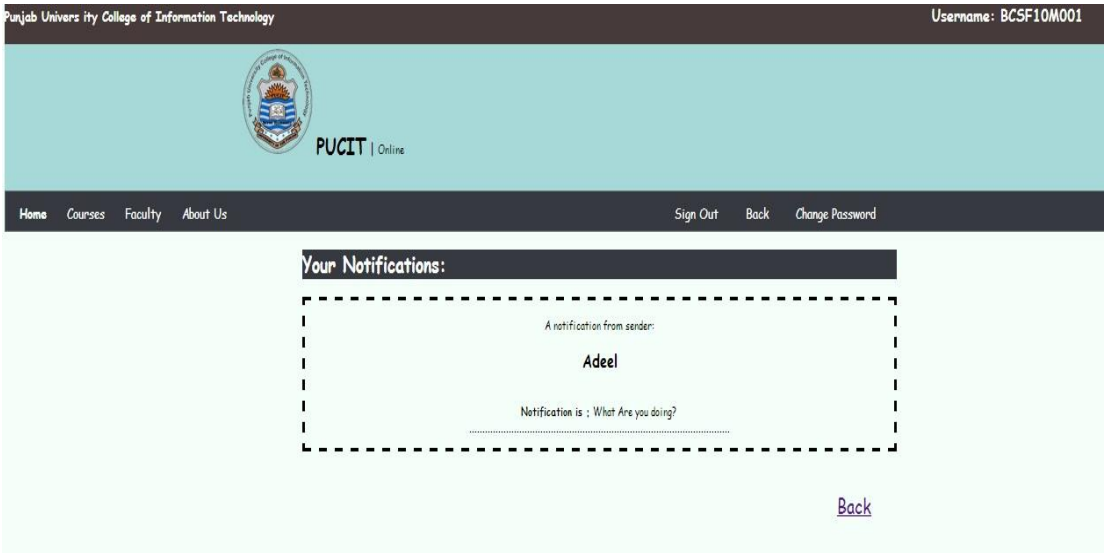
Upload Assignment:-



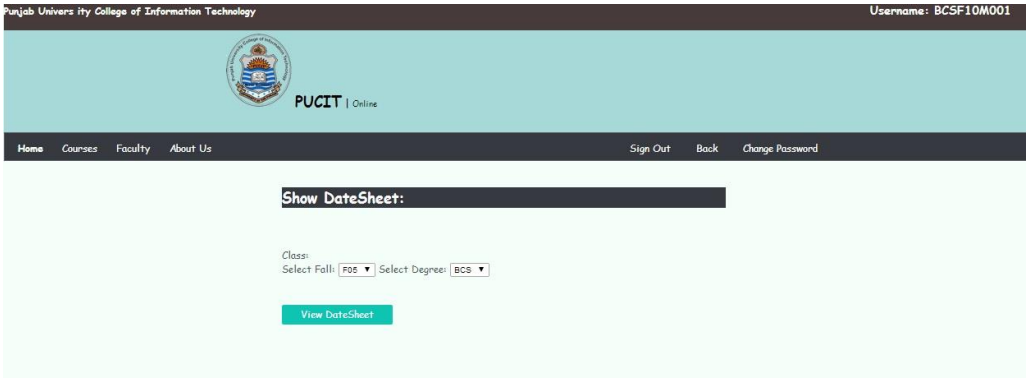
Teacher Course View:-



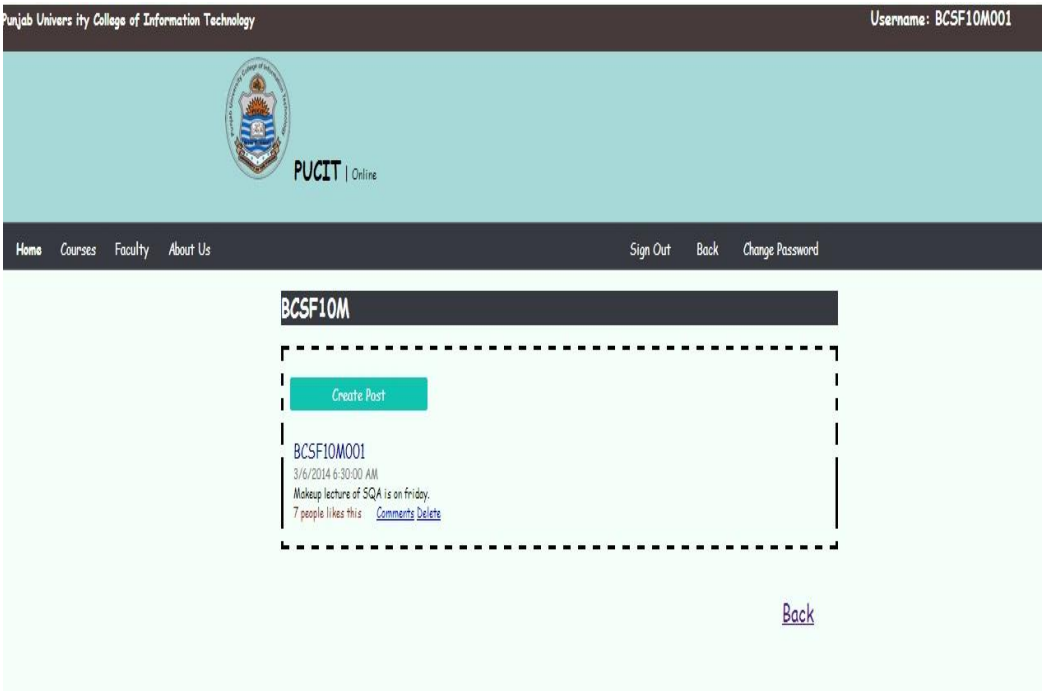
Student Notifications:-



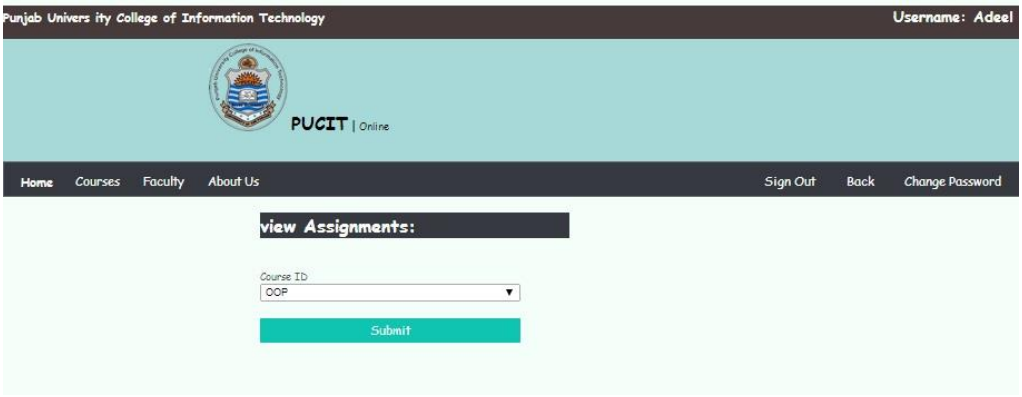
Student view his Date Sheet



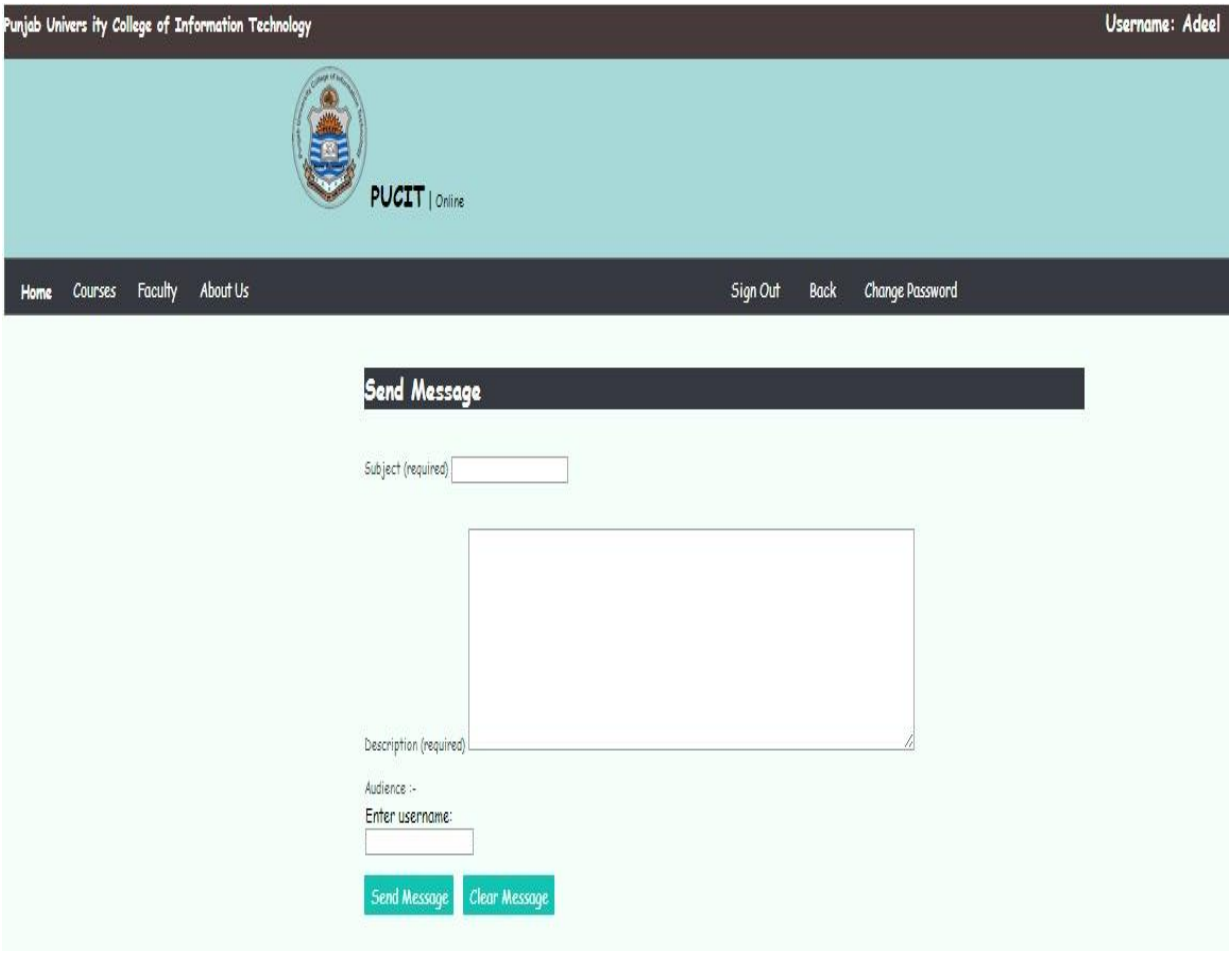
Student Discussion Forum (Group View):-



View Assignment:-



Send Messages:-



Function point estimated:-

FP est. = Count Total * [0.65 + 0.01 * (Fi)]
FP est. = 232 * [0.65 + 0.01 * (46)]

Cost per Function Point:-

(Cost = financial investment)
Cost / FP = labor rate / productivity parameter
Labor rate = 15000 Rupees/month
Productivity parameter = 35FP/ month PM

Total Project Cost:-

Regarding finance:-
Total Project Cost = FP est. * (cost / FP)

Total Estimated Effort:-

Total Estimated Effort = FP est. / productivity parameter (keeping productivity parameter = 14hours per fp)