Cairo University
Faculty of Computers and Information
Department of Computer Science

FCI E-Campus

The Way to Better Education

Academic Year 2017-2018

Final Year Documentation of Graduation Project

Cairo University
Faculty of Computers and Information
Department of Computer Science

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Introduction

Abstract

Organizing time for a faculty student is an essential part of his success. This has been always a problem with no definite solution.

The students at Faculty of Computer and Information, Cairo University are heavily distracted between many online places.

Facebook groups, E-com, Acadox, GDrive and a lot more. Cluttered and unorganized, theses websites do bad to students more than they do them good.

Our app is an effective solution for all the problems facing students at FCI. It combines all what they will need in a single place saving them from distraction and ad-flooded websites. Targeted for their needs, it facilitates learning and helps them focus on the more important things, i.e. learning.

Introduction to the main area of the project

The main area of this project is **software engineering**. Engineering by itself is the application of well-understood scientific methods to the construction, operation, modification and maintenance of useful devices and systems. However, Software Engineering is the sub discipline of Computer Science that attempts to apply engineering principles to the creation, operation, modification and maintenance of the software components of various systems. As with much of Computer Science, the subject of Software Engineering is at a very early stage in its development. It is much more of an art than a science, and at present has little in common with classical engineering.

Someday, Software Engineering may well be concerned with the application of well-understood scientific methods to the construction, operation, modification and maintenance of software. Today, however, Software Engineering is concerned with finding ways in which to produce working software for predictable costs in predictable time. When the problems involved are very simple or when only one person is involved, implementing software to meet their own needs, there isn't much to be said, and we are a long way from having any scientific principles for the production of software. Therefore, the major focus of software engineering today is on well-tested heuristics for the production of software to solve complex problems when many people are involved in the process, as users, as analysts, as programmers, as managers, etc. Therefore, most of the issues in Software Engineering are concerned with interactions among people, rather than with the production of software.

Software engineering can be divided into sub-disciplines. Some of them are:

- Software requirements (or Requirements engineering): The elicitation, analysis, specification, and validation of requirements for software.
- Software design: The process of defining the architecture, components, interfaces, and other characteristics of a system or component. It is also defined as the result of that process.
- Software construction: The detailed creation of working, meaningful software through a combination of programming (aka coding), verification, unit testing, integration testing, and debugging.
- Software testing: An empirical, technical investigation conducted to provide stakeholders with information about the quality of the product or service under test.

Motivation

Organizing time for a faculty student is an essential part of his success. In college, it can be hard to remember due dates, assignments and tasks for each class when you don't have the same classes every day or professors continually reminding you of important dates. Thus, it's important the students stay organized, so they can be successful and less stressed.

There's no worse feeling than walking into class and realizing an assignment was due and you missed the deadline. Generally, when your assignments and key dates are outlined for each class, you're better able to prepare and allocate your time accordingly, leaving you less stressed. When you're less stressed, you are able to focus your energy and attention on more important things…like studying!

Also, with so many fun things going on around campus and with your friends, you don't want an assignment or project you forgot about to hinder your ability to spend some time doing something social. If you have things organized, you don't have to worry about forgetting a deadline, and you can plan for social events by accomplishing your assignments and studying early!

As a college student, there are inevitably weeks when multiple tests occur or various projects are due, especially around midterms and finals. When this occurs, it's even more important to have a plan, so you can prioritize your study time and start studying enough in advance to be prepared for all your classes without the need for ineffective late-night cramming

Problem definition

When it comes to organizing their class schedule, lectures/sections/labs materials and upcoming assignments/exams, students here at Faculty of Computer and Information, Cairo University are in a terrible mess.

Students at FCI are scattered across many places. Some professors and TAs publish their announcements and materials on the faculty's official website, others use a third-party website such as Acadox, and moreover some professors and TAs send the materials and announcements to a student who is supposed to deliver that to all the other students. Besides that, the faculty's schedule is provided to students as just a plain document. Students lose track of assignments deliveries and quizzes that they have.

Moreover, the faculty doesn't provide a forum where the students can ask and discuss about things relating to their courses or things that aren't clear for them or they just don't understand. Students have to use social network websites such as Facebook to communicate which is so distracting and it won't be appropriate for professors and TAs to answer the questions and help the students.

We, as students at FCI, most often find ourselves scattered between the faculty's website, Acadox, Facebook, GDrive, Dropbox, Mega, etc.… After all of that we and the other student at FCI can't help being lost and unorganized.

Project Objective

This project aims to create a mobile application that will help students & staff at FCI stay organized. The app will provide students, teacher assistants & professors with their schedule, depending on the courses they have registered. The schedule will tell them what lectures/labs/sections they have and the location of these in the faculty lectures/sections halls and labs. If the student doesn't know the location of his lecture or lab the app will help him and show him a map to where the lecture/section hall or lab is in the faculty.

Also, users receive new announcements from the faculty notifying them with important events happening at the faculty such as official holidays, the dates of the beginning of the semesters, etc.

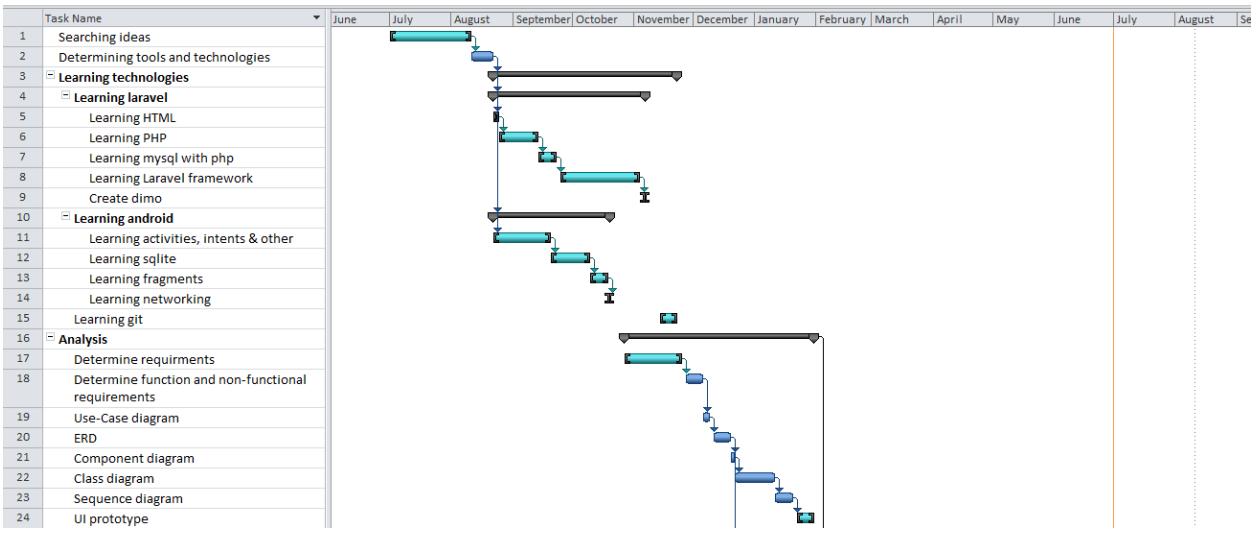
Tasks, quizzes and assignments deliveries due dates were always a problem. To help students keep track with their courses, our app gives an overview with what is due this day and the next. It also gives them a list combining all tasks from all the courses they are registered in. Students will also be notified regularly to remind them of their assignments, quizzes and exams and urge them to do their studies and work early before due date.

The app will organize downloading and uploading materials and will provide each course's lectures, sections and labs with its materials that were uploaded.

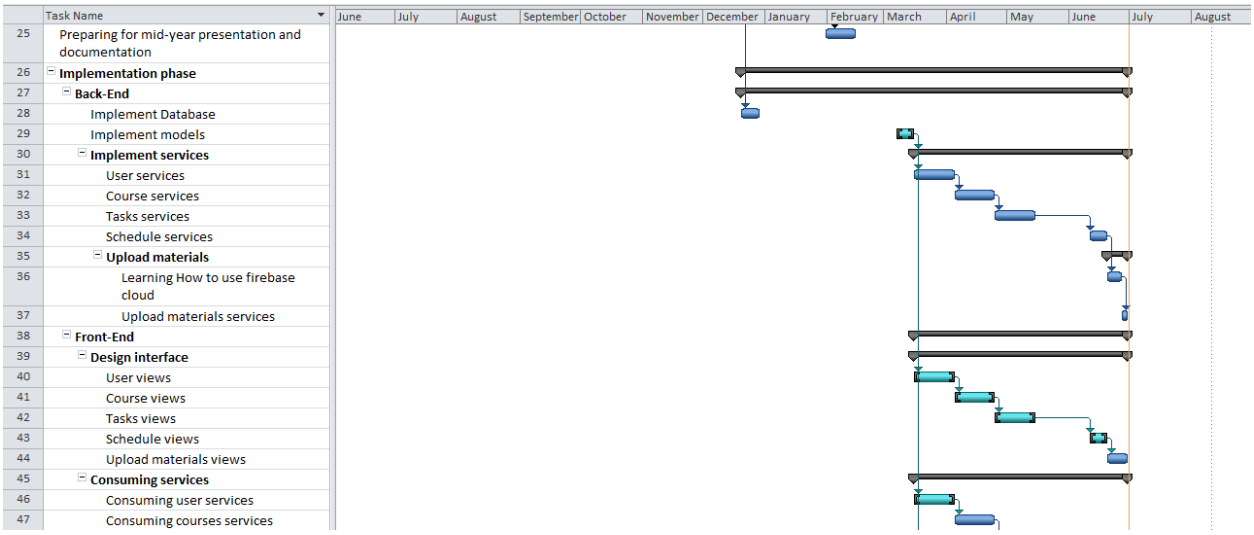
The app will provide a forum for the students to communicate with each other as well as with TAs and professors. Students can help each other and what will be better is that now it will be appropriate for professors and TAs to enter the forum and answer some of these questions. The forum will be Q/A based. Posts will have a title, body and a marker to indicate whether the problem for this post has been solved and answered or not yet.

Being a mobile application means that all these important features will be available all the time and from anywhere. As nowadays, mobile phones don't leave one's hand and pocket. Either the user is at his house or outside catching transportation or doing something, he can open the app and check his courses.

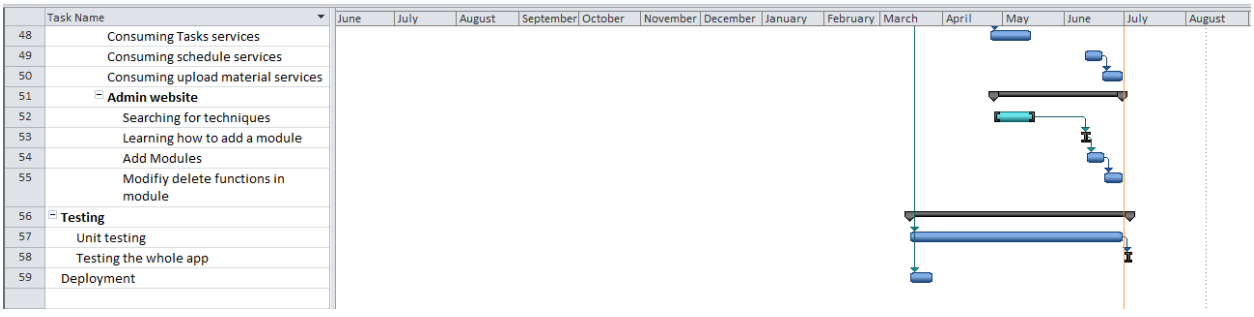
Gantt chart of project time plan



	Task Name
1	Searching ideas
2	Determining tools and technologies
3	**Learning technologies**
4	**Learning laravel**
5	Learning HTML
6	Learning PHP
7	Learning mysql with php
8	Learning Laravel framework
9	Create dimo
10	**Learning android**
11	Learning activities, intents & other
12	Learning sqlite
13	Learning fragments
14	Learning networking
15	Learning git
16	**Analysis**
17	Determine requirments
18	Determine function and non-functional requirements
19	Use-Case diagram
20	ERD
21	Component diagram
22	Class diagram
23	Sequence diagram
24	UI prototype



	Task Name
25	Preparing for mid-year presentation and documentation
26	**Implementation phase**
27	**Back-End**
28	Implement Database
29	Implement models
30	**Implement services**
31	User services
32	Course services
33	Tasks services
34	Schedule services
35	**Upload materials**
36	Learning How to use firebase cloud
37	Upload materials services
38	**Front-End**
39	**Design interface**
40	User views
41	Course views
42	Tasks views
43	Schedule views
44	Upload materials views
45	**Consuming services**
46	Consuming user services
47	Consuming courses services



	Task Name
48	Consuming Tasks services
49	Consuming schedule services
50	Consuming upload material services
51	**Admin website**
52	Searching for techniques
53	Learning how to add a module
54	Add Modules
55	Modifiy delete functions in module
56	**Testing**
57	Unit testing
58	Testing the whole app
59	Deployment

	Task Name	Duration	Start	Finish	Predecessors
1	Searching ideas	30 days	Sat 7/1/17	Thu 8/10/17	
2	Determining tools and technologies	7 days	Fri 8/11/17	Mon 8/21/17	1
3	**Learning technologies**	**67 days**	**Tue 8/22/17**	**Wed 11/22/17**	**2**
4	**Learning laravel**	**55 days**	**Tue 8/22/17**	**Mon 11/6/17**	**2**
5	Learning HTML	3 days	Tue 8/22/17	Thu 8/24/17	2
6	Learning PHP	14 days	Fri 8/25/17	Wed 9/13/17	5
7	Learning mysql with php	7 days	Thu 9/14/17	Fri 9/22/17	6
8	Learning Laravel framework	30 days	Mon 9/25/17	Fri 11/3/17	7
9	Create dimo	1 day	Mon 11/6/17	Mon 11/6/17	8
10	**Learning android**	**43 days**	**Tue 8/22/17**	**Thu 10/19/17**	**2**
11	Learning activities, intents & other	21 days	Tue 8/22/17	Tue 9/19/17	2
12	Learning sqlite	14 days	Wed 9/20/17	Mon 10/9/17	11
13	Learning fragments	7 days	Tue 10/10/17	Wed 10/18/17	12
14	Learning networking	1 day	Thu 10/19/17	Thu 10/19/17	13
15	Learning git	7 days	Tue 11/14/17	Wed 11/22/17	
16	**Analysis**	**68 days**	**Fri 10/27/17**	**Tue 1/30/18**	
17	Determine requirments	21 days	Fri 10/27/17	Fri 11/24/17	
18	Determine function and non-functional requirements	7 days	Mon 11/27/17	Tue 12/5/17	17
19	Use-Case diagram	3 days	Wed 12/6/17	Fri 12/8/17	18
20	ERD	7 days	Mon 12/11/17	Tue 12/19/17	19
21	Component diagram	2 days	Wed 12/20/17	Thu 12/21/17	20
22	Class diagram	14 days	Fri 12/22/17	Wed 1/10/18	21
23	Sequence diagram	7 days	Thu 1/11/18	Fri 1/19/18	22
24	UI prototype	7 days	Mon 1/22/18	Tue 1/30/18	23

	Task Name	Duration	Start	Finish	Predecessors
25	Preparing for mid-year presentation and documentation	11 days	Wed 1/31/18	Wed 2/14/18	16
26	**Implementation phase**	**138 days**	**Wed 12/20/17**	**Fri 6/29/18**	
27	**Back-End**	**138 days**	**Wed 12/20/17**	**Fri 6/29/18**	
28	Implement Database	7 days	Wed 12/20/17	Thu 12/28/17	20
29	Implement models	7 days	Wed 3/7/18	Thu 3/15/18	
30	**Implement services**	**76 days**	**Fri 3/16/18**	**Fri 6/29/18**	**29**
31	User services	14 days	Fri 3/16/18	Wed 4/4/18	29
32	Course services	14 days	Thu 4/5/18	Tue 4/24/18	31
33	Tasks services	14 days	Wed 4/25/18	Mon 5/14/18	32
34	Schedule services	7 days	Mon 6/11/18	Tue 6/19/18	33
35	**Upload materials**	**8 days**	**Wed 6/20/18**	**Fri 6/29/18**	
36	Learning How to use firebase cloud	5 days	Wed 6/20/18	Tue 6/26/18	34
37	Upload materials services	3 days	Wed 6/27/18	Fri 6/29/18	36
38	**Front-End**	**76 days**	**Fri 3/16/18**	**Fri 6/29/18**	
39	**Design interface**	**76 days**	**Fri 3/16/18**	**Fri 6/29/18**	
40	User views	14 days	Fri 3/16/18	Wed 4/4/18	29
41	Course views	14 days	Thu 4/5/18	Tue 4/24/18	40
42	Tasks views	14 days	Wed 4/25/18	Mon 5/14/18	41
43	Schedule views	7 days	Mon 6/11/18	Tue 6/19/18	42
44	Upload materials views	8 days	Wed 6/20/18	Fri 6/29/18	43
45	**Consuming services**	**76 days**	**Fri 3/16/18**	**Fri 6/29/18**	
46	Consuming user services	14 days	Fri 3/16/18	Wed 4/4/18	29
47	Consuming courses services	14 days	Thu 4/5/18	Tue 4/24/18	46

	Task Name	Duration	Start	Finish	Predecessors
48	Consuming Tasks services	14 days	Wed 4/25/18	Mon 5/14/18	47
49	Consuming schedule services	7 days	Mon 6/11/18	Tue 6/19/18	
50	Consuming upload material services	8 days	Wed 6/20/18	Fri 6/29/18	49
51	**Admin website**	**46 days**	**Fri 4/27/18**	**Fri 6/29/18**	
52	Searching for techniques	14 days	Fri 4/27/18	Wed 5/16/18	
53	Learning how to add a module	1 day	Mon 6/11/18	Mon 6/11/18	52
54	Add Modules	7 days	Tue 6/12/18	Wed 6/20/18	53
55	Modifiy delete functions in module	7 days	Thu 6/21/18	Fri 6/29/18	54
56	**Testing**	**78 days**	**Fri 3/16/18**	**Tue 7/3/18**	
57	Unit testing	76 days	Fri 3/16/18	Fri 6/29/18	29
58	Testing the whole app	2 days	Mon 7/2/18	Tue 7/3/18	57
59	Deployment	7 days	Fri 3/16/18	Mon 3/26/18	29

Project development methodology

In this project we used Scrum Methodology.

Scrum is an agile method for project management. Scrum is characterized by:

- A living backlog of prioritized work to be done.
- Completion of a largely fixed set of backlog items in a series of short iterations or sprints.
- A brief daily meeting (called a scrum), at which progress is explained, upcoming work is described, and obstacles are raised.
- A brief planning session in which the backlog items for the sprint will be defined.
- A brief heartbeat retrospective, at which all team members reflect about the past sprint.

Scrum is facilitated by a scrum master; whose primary job is to remove impediments to the ability of the team to deliver the sprint goal. The scrum master is not the leader of the team but acts as a productivity buffer between the team and any destabilizing influences

The used tools in the project

In this project we build our software in SOA architecture.

The backend:

- Developed using the Laravel PHP framework alongside with MySQL DBMS.
- Developed with Jetbrains PhpStorm IDE and XAMPP stack.
- Deployed on Heroku which is a cloud platform-as-a-service (PAAS).

The frontend (client):

- Android application developed using the native Android framework with Java.
- Developed with Android Studio IDE and Virtual Emulators to test our app.
- Published with the Google PlayStore console.

Report Organization

The rest of this document gives more in-depth information about the project; its analysis, design, development & testing.

- **Chapter 2: Related work** demonstrates the nearest examples of the project and the main differences between them and this project
- **Chapter 3: System Analysis** gives in complete details the project analysis conducted. This includes the project specification; defining its functional & non-functional requirements. It contains our use case diagram as well as the system test cases.

- **Chapter 4: System Design** explains the design criteria of the system built in the project. This includes the system component diagram, system class diagram, sequence diagram, the database entity relationship diagram (ERD) as well as the frontend GUI design.
- **Chapter 5: Implementation and Testing** demonstrates screenshots of the System running and samples of the applied test cases.

At the end of this document we also include the references used throughout this document.

Related work

1. **Acadox:**

A website that helps you manage coursework, connect and collaborate with learners, and document your achievements.

Link:

https://www.acadox.com

Difference:

- Our app manages the schedule of the registered courses, it displays the slots time of the labs, sections & lectures of the course that you have registered in.
- It also manages the schedule of a specific day, it displays the slots time of the labs, sections & lectures of the courses you have in that day.
- Our app displays all the tasks you have in different courses and displays all the tasks due to a specific day.
- Student also cannot join a course unless they pass its prerequisites courses.
- It also shows a static map for the faculty of computers and Information – Cairo University.
- In addition to our app will be officially targeted to our faculty "faculty of computers and Information – Cairo University" with a verified TAs and Professors.

2. **E-com:**

The official Community website for the faculty of computers and information – Cairo University that contains all the student, TAs and doctors, it displays the grades, attendance & GPA, doctors and TAs can upload materials and send announcements, it contains many other functionalities that manages the communication between the faculty stuff and the students.

Link:
http://ecom.fci.cu.edu.eg

Difference:

- Our app manages the schedule of the registered courses, it displays the slots time of the labs, sections & lectures of the course that you have registered in.
- It also manages the schedule of a specific day, it displays the slots time of the labs, sections & lectures of the courses you have in that day.
- Our app displays all the tasks you have in different courses and displays all the tasks due to a specific day.

- It is also more organized in displaying the resources of a specific course.
- It also has a forum for each course that helps students to add post to ask about anything related to that course and also helps TAs & professors to add post to make announcement for the students joined that course.
- It also shows a static map for the faculty of computers and Information – Cairo University.
- In addition to our app is an android app while the E-com is a website.
- E-com has a very poor user interface design. It has low security as it's written in old PHP.

3. **Facebook:**

The most famous social app, nowadays students of the same level in the faculty creates a group to share materials and information about the courses and the faculty.

Due to the spreading of the Facebook it becomes the main app in communication between students, even the TAs and sometimes doctors too.

Link:

https://www.facebook.com

Difference:

- First of all, Facebook is not that app that its purpose is to manage a University life, organize faculty courses in addition to it is not an official app to communicate with faculty stuff.
- Our app manages the schedule of the registered courses, it displays the slots time of the labs, sections & lectures of the course that you have registered in.
- It also manages the schedule of a specific day, it displays the slots time of the labs, sections & lectures of the courses you have in that day.
- It also displays all the tasks you have in different courses and displays all the tasks due to a specific day.
- It also more organized in displaying the resources of a specific course.
- It also has a form for each course that helps students to add post to ask about anything related to that course and also helps TAs & professors to add post to make announcement for the students joined that course, "each form is for a specific course".
- It also shows a static map for the faculty of computers and Information – Cairo University.
- In addition to our app will be officially to our faculty "faculty of computers and Information – Cairo University" with a verified TAs and Professors.

4. **“School Planner” Android application:**

School Planner is an Android application published on the PlayStore. It is a handy app for students of all ages that was designed to help you organize your career as a student and have everything under control. Whether you are attending elementary school, high school or college, this is the app for you!

Link (Google PlayStore):

https://play.google.com/store/apps/details?id=daldev.android.gradehelper

Difference:

- School Planner is the closest application to our project almost offering most of the features that we offer. It offers courses, schedules, tasks, etc…
- School Planner works completely offline. No backend support at all. Users have to add courses themselves, add their tasks themselves & add their schedules themselves. So basically, you have to do a lot of work just to setup the app. And you’ll have to do every semester.
- Our app has a backend. Providing easy registration for the courses. Student just enters the course no more.
- Communication is an important part of the education process. School Planner has no forum. Our app has one for each course allowing students, TAs & Professors to communicate on the forum sharing knowledge and solving problems.
- School Planner is not targeted for FCI. It’s a general app. Our app’s features are specifically designed for FCI.
- School Planner is a paid software. It contains annoying ads that distracts the user and violates the sole purpose of creating such app; AVOIDING DISTRACTIONS.
- FCI E-campus is a free and open source software (licensed with GPLv3.0 license) published on the PlayStore free of any charge.

System Analysis

Project specification

Functional requirement

For student

Sign up

Student can create his account in our system.

Login

He can login to his account and then continue on the system.

Update his password

Student can update his password and set new password.

Show course

get all course details, the name of course, description, TAs and professors in course, schedule of course, materials and tasks.

Join course

Student enters the code of course and the pass code for this course and his group number to join this course.

Show all his courses

Student can show all the courses he has joined in a list.

Show all tasks

Get tasks information such as start date, end date, description.

Get all tasks for specific course

Get tasks and know their due dates.

Show schedule for specific course

Show the time and place for lectures, labs and sections

Show his own schedule

Get schedules for all his courses and only for his group in one place.

Overview of his day

Show all lectures, labs and section in his day and the next to never miss a lecture, lab or section.

show all materials for specific course

Get all official materials

Download material

Student can download official materials for specify course

Show static map

This map is a static graphical map which guides the students by showing the buildings and the location of each lecture/section hall, the mosque, the cafeteria, etc.

Show all Announcements

All the students signed up to the app can see announcements, Announcements does not relate to a specific course. The announcements will be information related to the faculty in general (ex. informing students that a day is an official holiday, informing students about the date of the first day of the term, etc…)

Add post to forum in specific course

Every course has a Q/A forum to add posts in it, so students can post to ask any thing about this course and the post will appear to all users who has joined in this course.

Mark posts as answered

If the problem or the inquiry of the post has been answered, student can mark the post as answered.

Add comments to post

Student can comment to any post in the course forum he has joined in.

Show forum

Student can see forum in course he has joined in and see posts in this forum and comments for the posts

For TA and professor

Sign up

TA & professor can create his account in our system

Login

He can login to his account and then continue on the system

Activate account

The account must be activated. The system sends to his academic email the activation code and he inserts it in our app in order to continue.

Update his password

Student can update his password and set new password

Show course

get all course details, the name of course, description, TAs and professors in course, schedule, materials and tasks.

Show course tasks

Get task information Start date, end date & description.

Add task

He adds tasks to course he has been assigned to.

Show schedule for specify course

Show the time and place for lectures, labs and sections

Show his own schedule for all the courses he assigned to

Get the schedule for all the courses he has been assigned to. TAs get their schedule by groups he is assigned to only.

Overview for his day

get all lectures, labs and section in his day and the next.

show all materials for specify course

get all official materials.

Upload material

TA and professor can upload lecture and labs to courses they're assigned to.

Download material

TA and Professor can download official materials for specify course.

Show static map

This map is a static graphical map which guides the students by showing the buildings and the location of each lecture/section, the mosque, the restaurant, etc.

Show all Announcements

All the students signed up to the app can see announcements that does not relate to a specific course. The announcements will be information related to the faculty in general (ex. informing students that a day is an official holiday, informing students about the date of the first day of the term, etc…).

Show forum

TA and Professor can see forum in course he has been assigned to and see posts in this forum and comment in posts.

Add post to forum in specific course

Every course has a forum to add posts in, so TA and professor can post to inform students with anything about this course and the post will appear to all users joined in this course.

Add comment to post

TA and Professor can comment to any post in his courses forums.

For Admin

Add department.

Add TA to the system.

Add professor to the system.

Add group to specific course.

Add new course to the system.

Add schedule to specific course.

Specify prerequisite courses for a specific course.

Add Announcement.

Assign TAs to Course.

Assign professor to Course.

Delete department.

Delete TA.

Delete Professor.

Delete group from specific course.

Delete course from system.

Delete schedule from specific course.

Delete Announcement.

Delete TAs from Course.

Delete Professor from Course.

Non-functional requirement

1. **Accessibility**
    - Due to the spreading of smart phones that uses android systems our application can be accessed by large community “as it will be an android app”.
2. **Availability**
    - Our app is available 24-hours.
3. **Regulatory compliance**
    - Schedules in our app will be very specific, without any fault and up-to-date with the college schedule.
4. **Cost**
    - Our app will be for free
5. **Deployment**
    - App is available on app store.
    - Back services are deployments
6. **Efficiency**
    - Our app will use only the needed martials “schedule for the student will contains the schedule of the courses that he registered in only without containing the schedule of the other courses.
7. **Effectiveness**
    - Our app will have all the features that the students needed instead of using more than one app.
8. **Extensibility**
    - We can add easily more features in our app in the future “that is what we decide to do in our project there is extra functions that we will added later.

9. **Maintainability**
    - If any user facing a problem in the app he can easily report it and we will repair it.
10. **Modifiability**
    - Some features can be modified easily like the shape of the schedule.
11. **Safety**
    - The data of any user will be completely save as it will not access by any other user.
12. **Open-source**
    - The source code will be available for any one.
13. **Usability**
    - Simple UI that help the user to use its functions easily.

Future work

1. **Moderator students**

There will be extra materials courses which will include the materials uploaded by the moderator students. These resources can be also files or links such as summaries or links to useful websites or videos.

Delete any forum post if they find that it was inappropriate such as unrelated to the course “or asked before (extra)”

2. **Upload task solution**

Tasks can be set to require students to upload their solutions. Students need to upload their solutions before due date. The course’s TAs & professors can download these solutions, correct them and add the grade to each student.

3. Reminder notifications

Students will get notifications regularly to remind them of their tasks that has a near due date.The Notification system in the application will be divided into two subsystems.
The first subsystem is responsible for notifying the users for any **new** incoming changes on the application. This will include notifying the users for new announcements, new assignments, new tasks added, new quizzes and new exams.

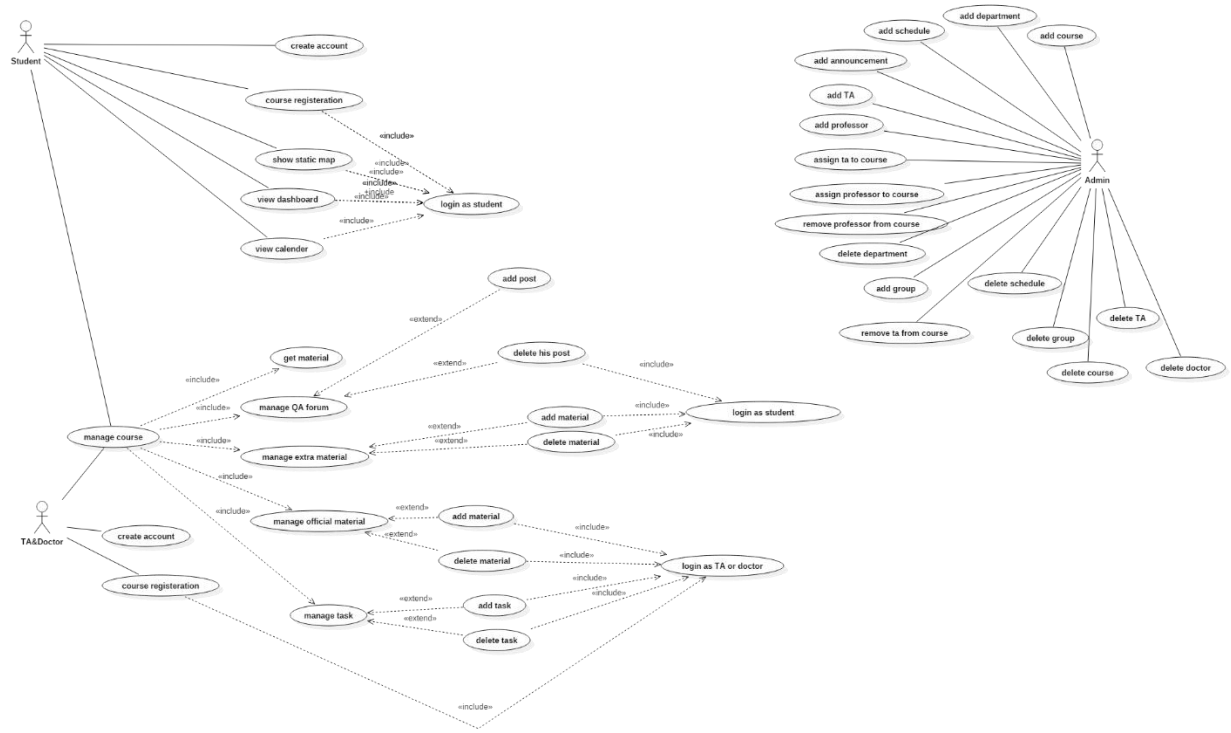
The notification system will not be a background service, but it will collaborate with the synchronization service on the client app. This sync service is responsible for listening to events on the backend. These events will be such as the arrival of a new announcement or the addition of a new assignment on the courses that the user is registered in. The sync service will update the application and calls the notification system to show a notification to the user.

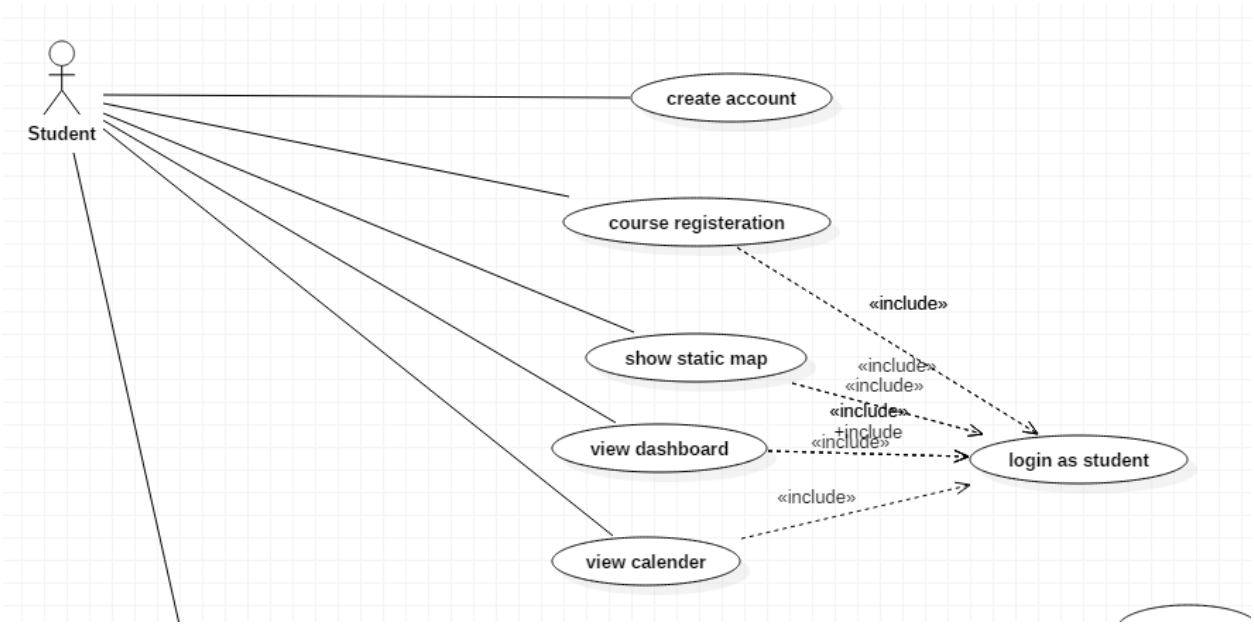
The second subsystem is a reminder background service that is responsible for showing reminders notifications. Reminder notifications will be managed locally without the need for any backend sync (very similar to an alarm application). Take this example: If a user has an assignment that will be delivered on Thursday the reminder service will send a notification before a week from the deadline, if the user hasn't marked this assignment as done, the reminder will continue and sends a notification to the user before 4 days from the deadline, then again if it's not marked as done it will send a notification to the user before 2 days from the deadline and so on it will continue to send notification before a day, then before 6 hours, … and so on until either the user either marks the assignment as done or the deadline is passed.

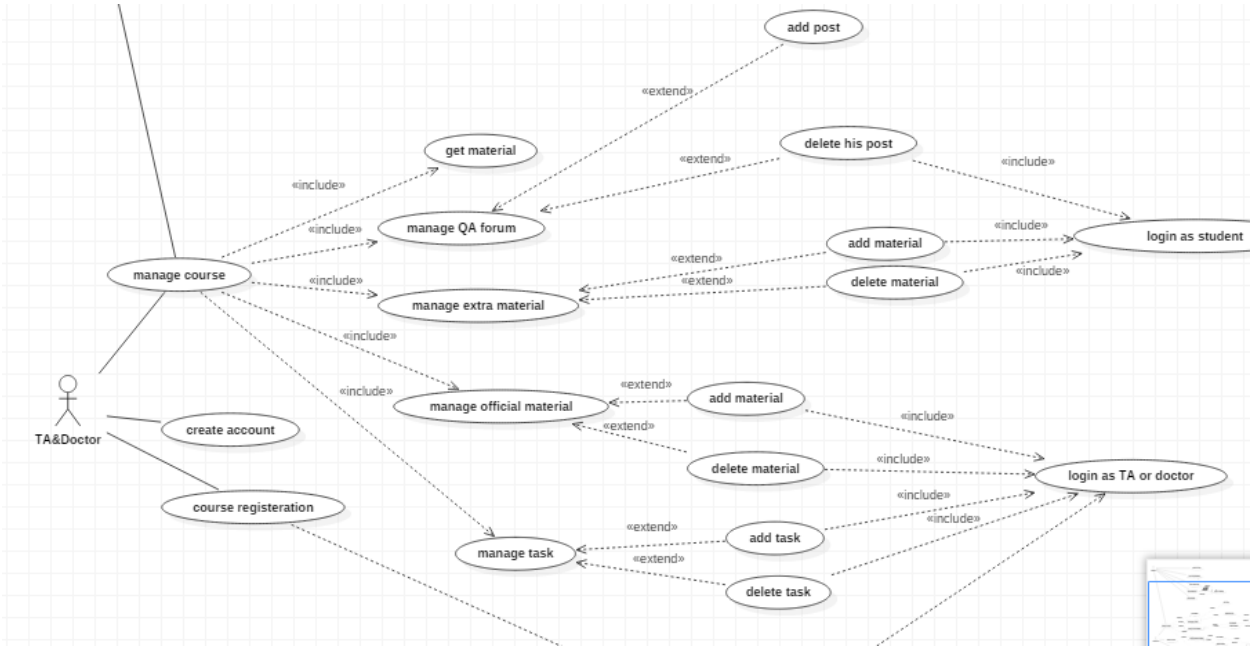
4. Private messages

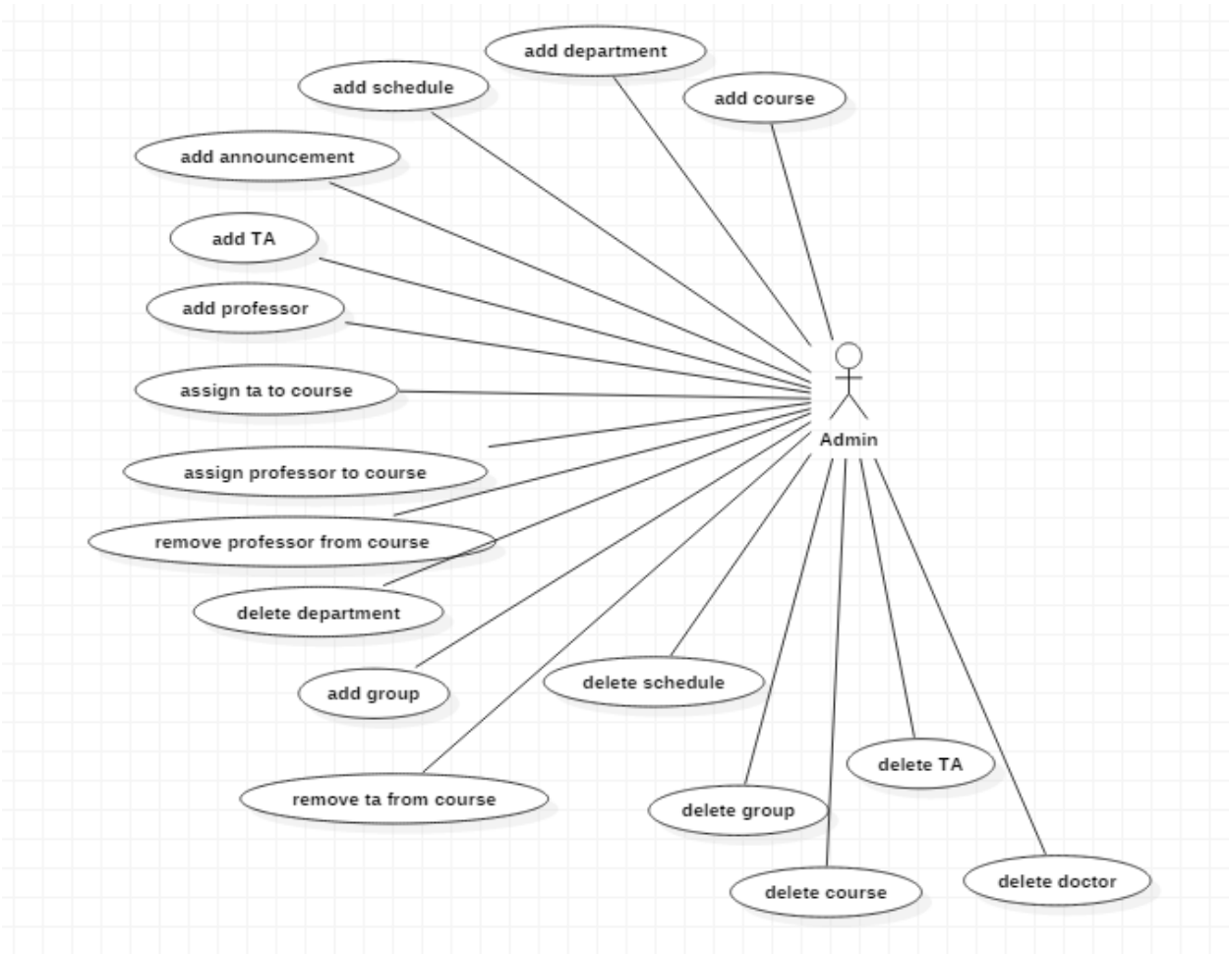
The app will allow users (professors, students or TAs) to send direct private messages to any other user. This is **not a chat service**. The messages will be similar to emails with a title, body & attachments such as images or raw files. The user can search for another user by his name or his ID in our system, then he can send a message to him as described above. Messages will be grouped in an inbox page and categorized and organized by the user it was sent to or received from (similar to chat rooms) so that all messages sent to or received from the same user appear in a single specific place inside the inbox.

Use case Diagrams






add post
«extend»
get material
delete his post
«extend»
«include»
«include»
«include»
manage QA forum
login as student
add material
«include»
«extend»
manage course
«include»
«extend»
delete material
«include»
manage extra material
«include»
«include»
manage official material
«extend»
add material
«include»
TA&Doctor
create account
«extend»
delete material
«include»
login as TA or doctor
course registeration
«include»
«include»
«extend»
add task
manage task
«extend»
delete task


add department
add schedule
add course
add announcement
add TA
add professor
assign ta to course
Admin
assign professor to course
remove professor from course
delete department
add group
delete schedule
delete TA
remove ta from course
delete group
delete course
delete doctor

Use Case Tables

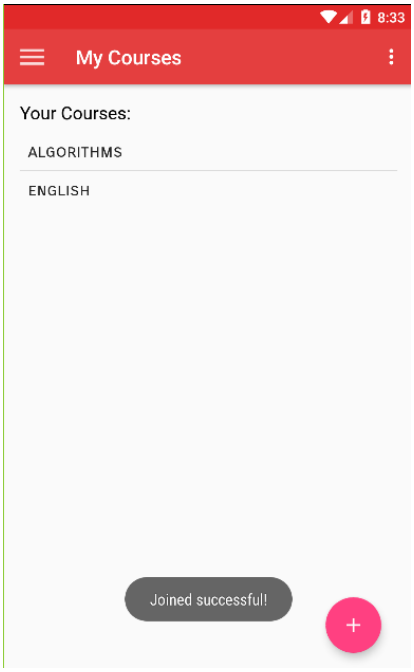
Use Case ID:	1	
Use Case Name:	Login	
Actors:	TA/Doctor – Student – Moderator student	
Pre-conditions:	User register in the app and validate his account	
Post-conditions:	_____	
Flow of events:	**User Action**	**System Action**
	• User Selects to login	
		• System returns Login page
	• User enters his username • User enters his password	
		• System Verifies his information • System logs him in to his account
Exceptions:	**User Action**	**System Action**
	• User Enter username and Password	
		• username does not exist or password is wrong • System rejects the Login • System demands the user to enter correct username and password
Includes:		
Notes and Issues:	Login will identify if the account corresponds to TA/Doctor, Student or Moderator student.	

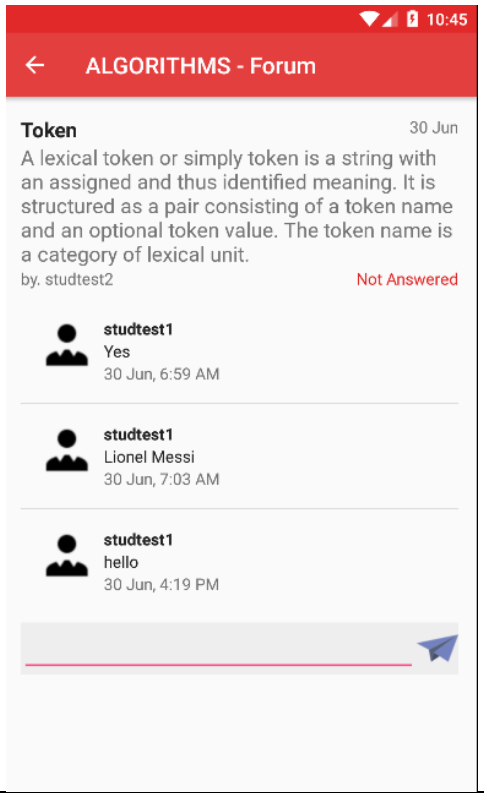
Use Case ID:	2	
Use Case Name:	TA/Doctor register	
Actors:	TA/Doctor	
Pre-conditions:	TA/Doctor has a valid academic E-mail	
Post-conditions:	TA/Doctor validate his account from the mail sent to his academic mail	
Flow of events:	**User Action**	**System Action**
	• TA/Doctor select to register	
		• System returns registration page
	• Enter the required information	
		• System check that neither of his data violate the specifications • System sent a verification code to the entered academic mail
	• TA/Doctor enters the verification code	
		• System match the verification code • creates the account
Exceptions:	**User Action**	**System Action**
	• TA/Doctor entered data that violate the specifications	
		• System recognize that the entered data violate the specifications • System demand the TA/Doctor to enter his data again in right manner.
Notes and Issues:	If TA/Doctor enter invalid E-mail he will not be able to validate his account so he will not be able to complete registration.	

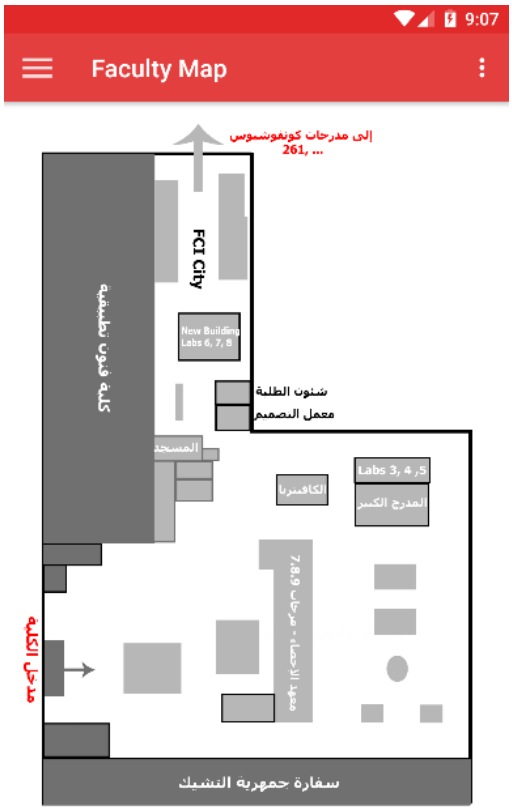
Use Case ID:	3	
Use Case Name:	Course registration	
Actors:	Student	
Pre-conditions:	Login	
Post-conditions:	_____	
Flow of events:	**User Action**	**System Action**
	• Student Show courses	
		• System return List of courses
	• Student select a specific course	
		• System return course information and some choices
	• Student Select register in this course	
		• System return a box to write course code
	• Student enter course code	
		• System check that the course code is right • System add this course to Student courses
Exceptions:	**User Action**	**System Action**
	• Student entered invalid course code	
		• System demand to enter course code again
Includes:		
Notes and Issues:	You should have the course code to register in the course	

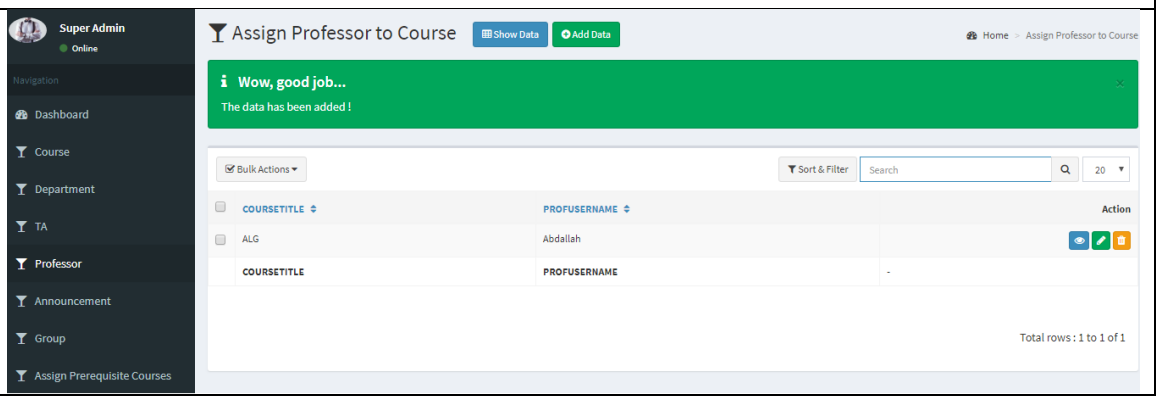
Use Case ID:	4	
Use Case Name:	Add Material	
Actors:	TA/Doctor – Moderator student	
Pre-conditions:	Login – Assign to this course	
Post-conditions:	_____	
Flow of events:	**User Action**	**System Action**
	• User shows the courses he assigned to	
		• System return List of courses
	• User select the course he wanted	
		• System return course information and some choices
	• User select add material	
		• System return a box to upload material
	• User upload material	
		• System assign the uploaded material to the course • System send notification to the students assigned to this course
Exceptions:	**User Action**	**System Action**
Includes:		
Notes and Issues:	If you are student the add material button will not appear to you	

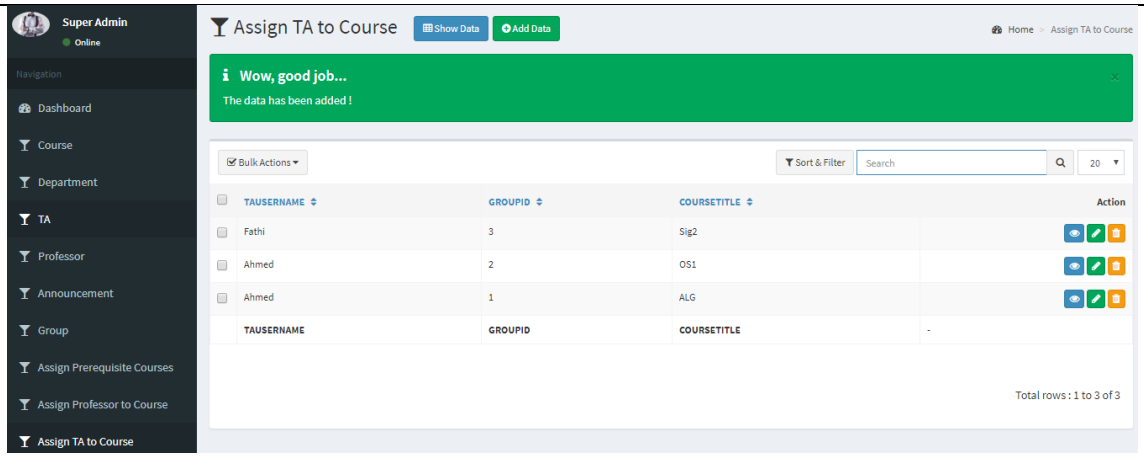
System test cases

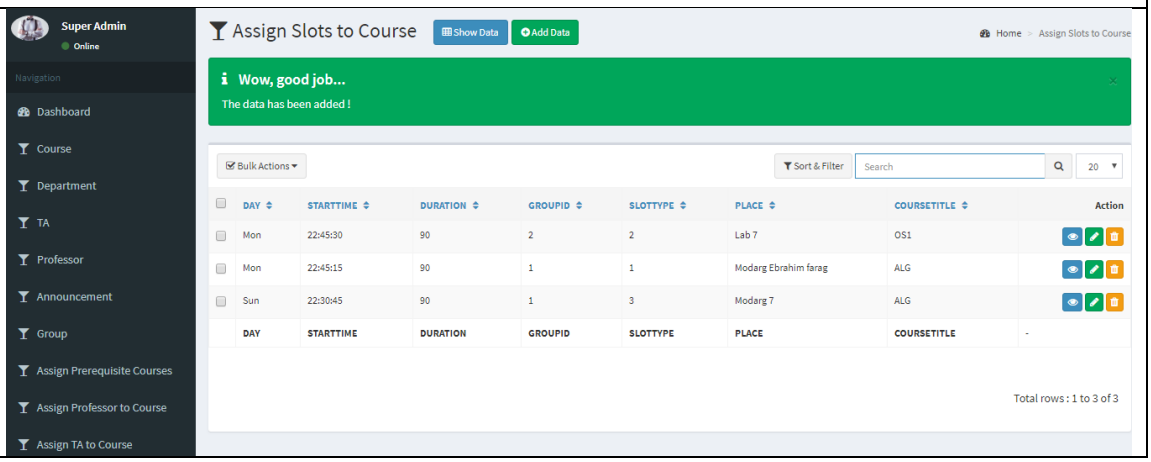
Name	Student Join Course
Scenario	Student join course with valid Course code and pass code
Description	Student will insert the course code and Its pass code to join it
Steps	1-Open app “FCI-ECampus” 2-Select My Courses Fragment 3-Click on “+” Button 4-Enter course code 5-Enter pass code 6-Enter group number 7-Click Join
Data	Course code = CS123 Pass code = ag123 Group number = 2
Expected Output	Joined successfully and redirect to My Courses Fragment Adding to it the new joined course
Actual Output	

Name	Comment on a Post
Scenario	User comment on a forum post
Description	User has ability to comment on any post in course's forum
Steps	1-Open app "FCI-ECampus" 2-Select My Courses Fragment 3-Select particular course 4-Click Open Forum 5-Select any post 6-Type the comment 7-Submit the comment
Data	Comment = hello
Expected Output	Comment added to the post and be visible to other users
Actual Output	

Name	Faculty Map
Scenario	User open faculty map
Description	Student, TA or Professor can look at the map of the faulty
Steps	1-Open app “FCI-ECampus” 2-Select Faculty Map Fragment
Data	
Expected Output	Simple Image of the faculty buildings is being showed
Actual Output	

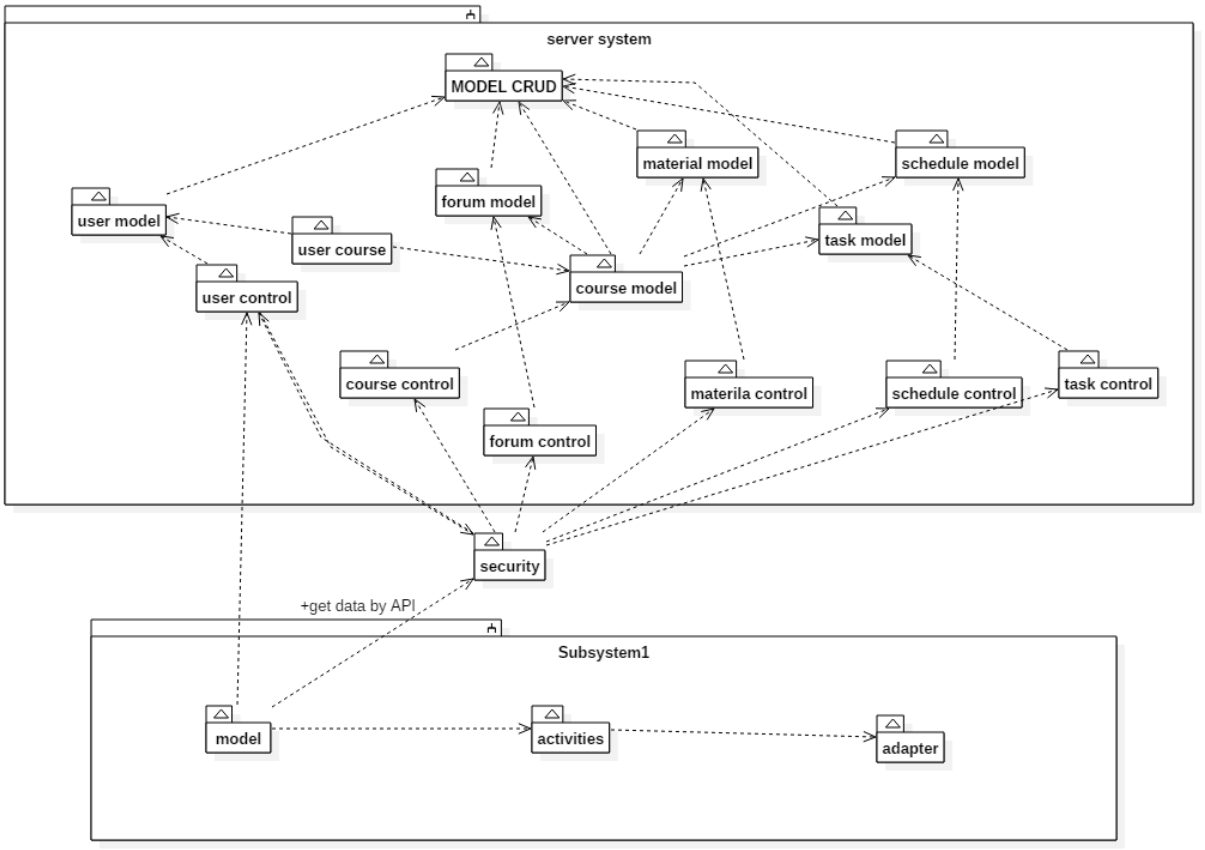
Name	Assign Professor to Course
Scenario	Admin login to his account → select assign professor to course → select the professor and the course → save
Description	It allow the admin to assign professors to the faculty courses
Steps	1. Open admin website 2. Login with admin account 3. Select Assign Professor to Course 4. Choose course title & professor username 5. Select save
Data	Course Title = ALG Professor Username = Abdallah
Expected Output	The data has been added !
Actual Output	

Name	Assign TA to Course
Scenario	Admin login to his account → select assign TA to course → select the TA, the group ID and the course → save
Description	It allow the admin to assign TAs to the faculty courses groups
Steps	1. Open admin website 2. Login with admin account 3. Select Assign TA to Course 4. Choose course title & TA username & group ID 5. Select save
Data	Course Title = ALG TA Username = Ahmed Group ID = 1
Expected Output	The data has been added !
Actual Output	

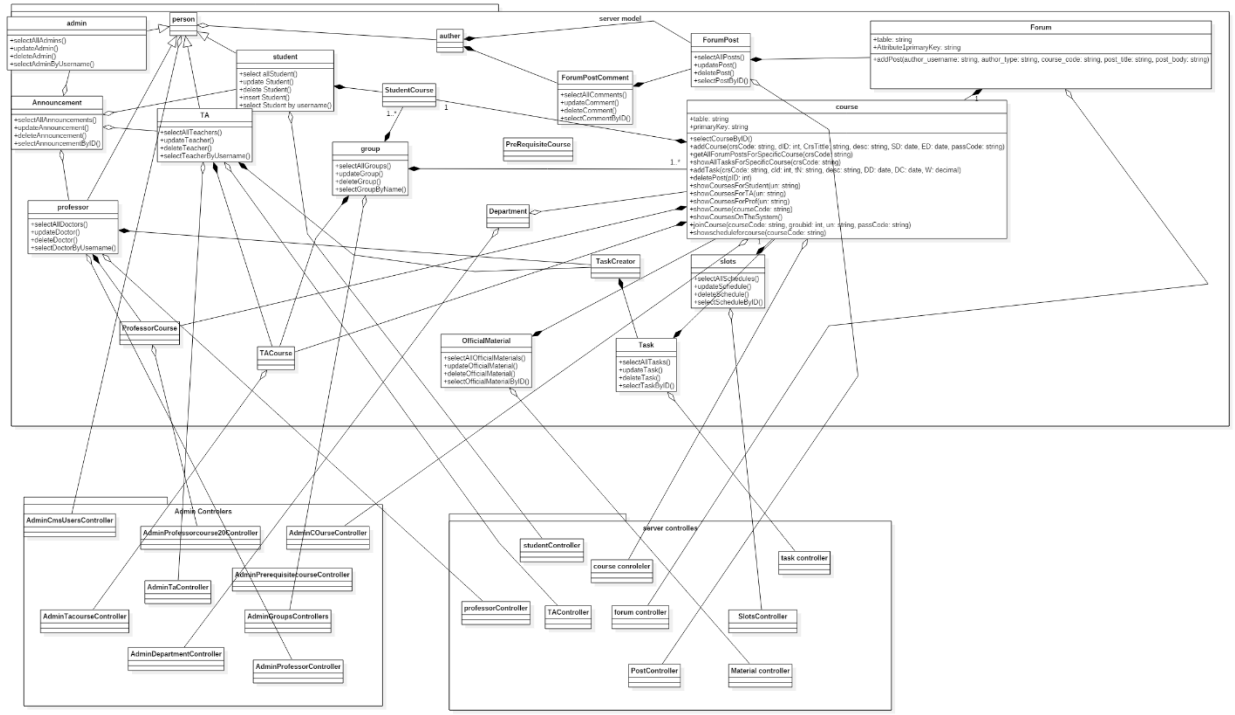
Name	Assign Slots to Courses
Scenario	Admin login to his account → select assign Slots to course → select the course and enter the data → save
Description	It allow the admin to add schedule to the faculty courses “assign lab slots, section slots or lecture slots”
Steps	1. Open admin website 2. Login with admin account 3. Select Assign Slots to Course 4. Choose course title & enter the data 5. Select save
Data	Day = Mon Start Time = 22:45:30 Duration = 90 Group ID = 2 Slot Type = 2 Place = Lab 7 Course Title = OS1
Expected Output	The data has been added !
Actual Output	

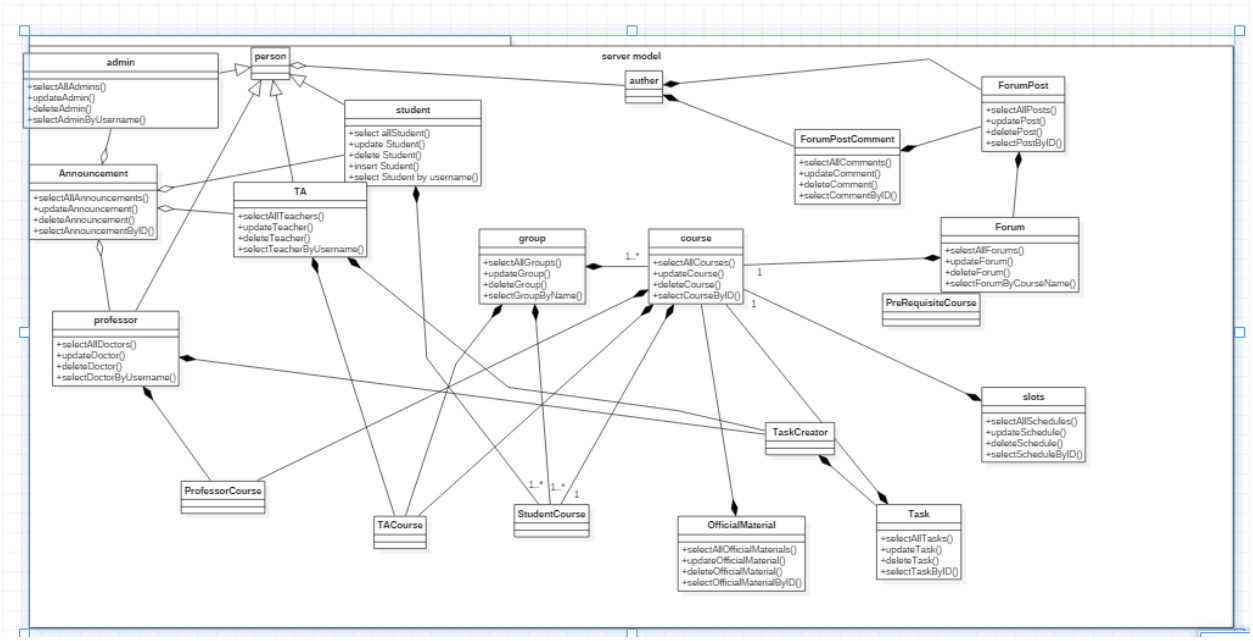
System Design

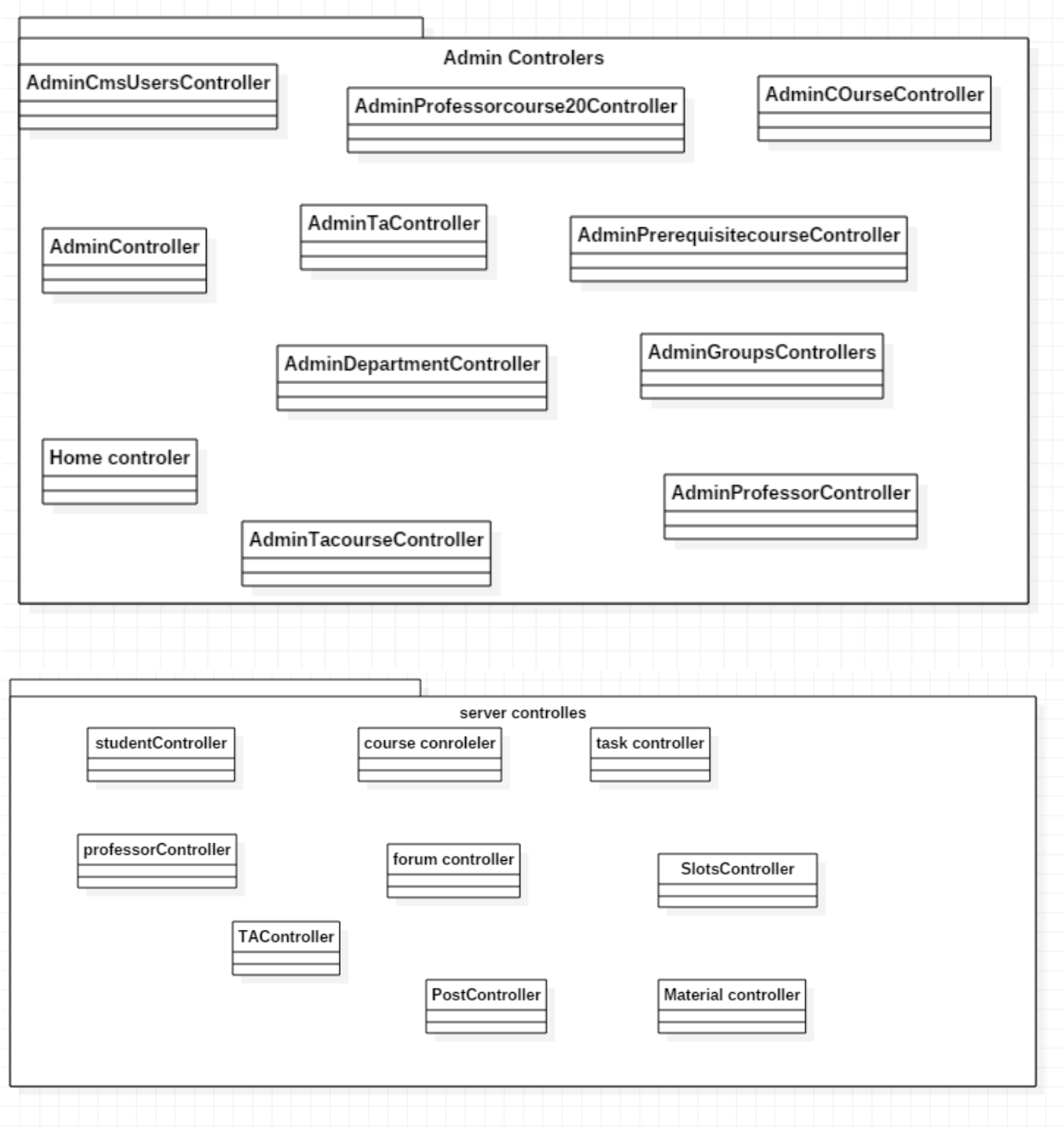
System Component Diagram



System Class Diagrams

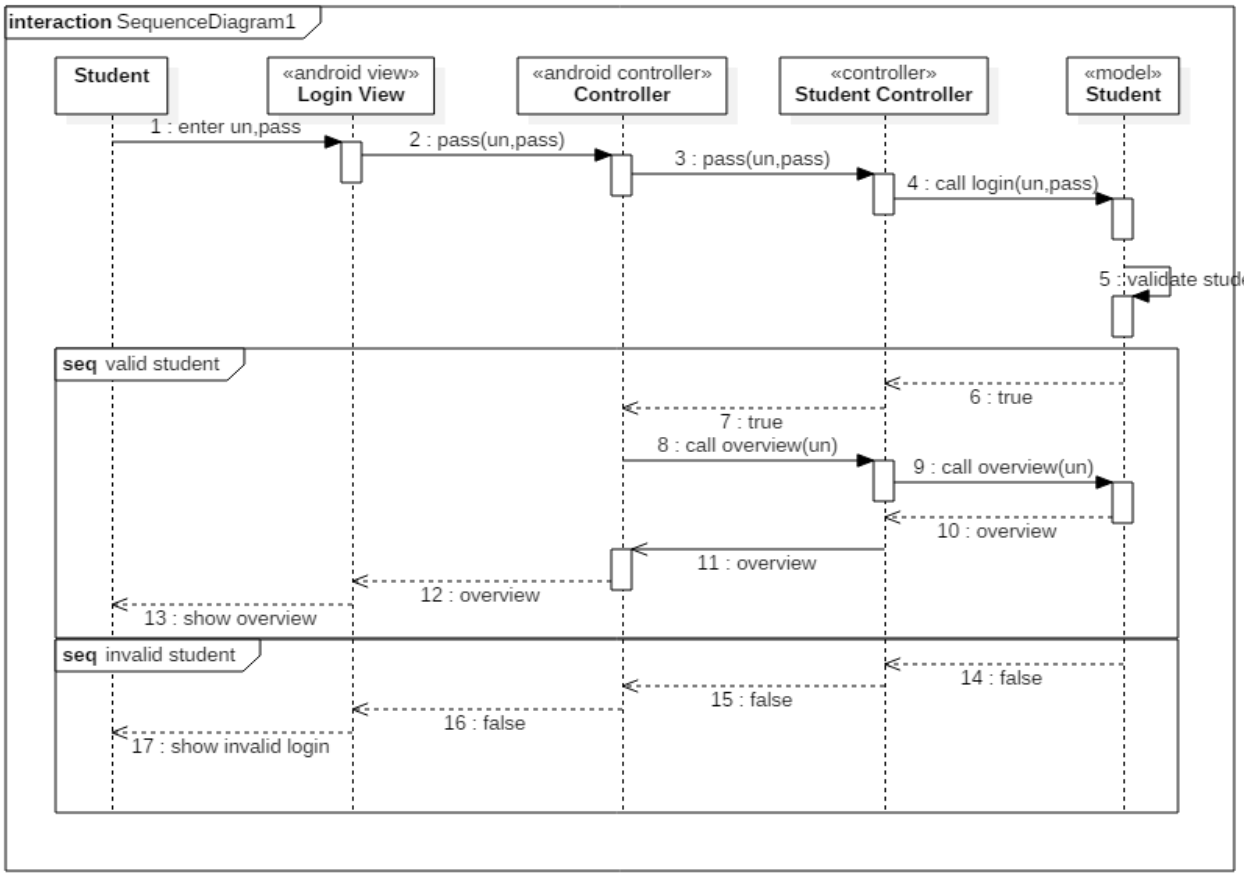




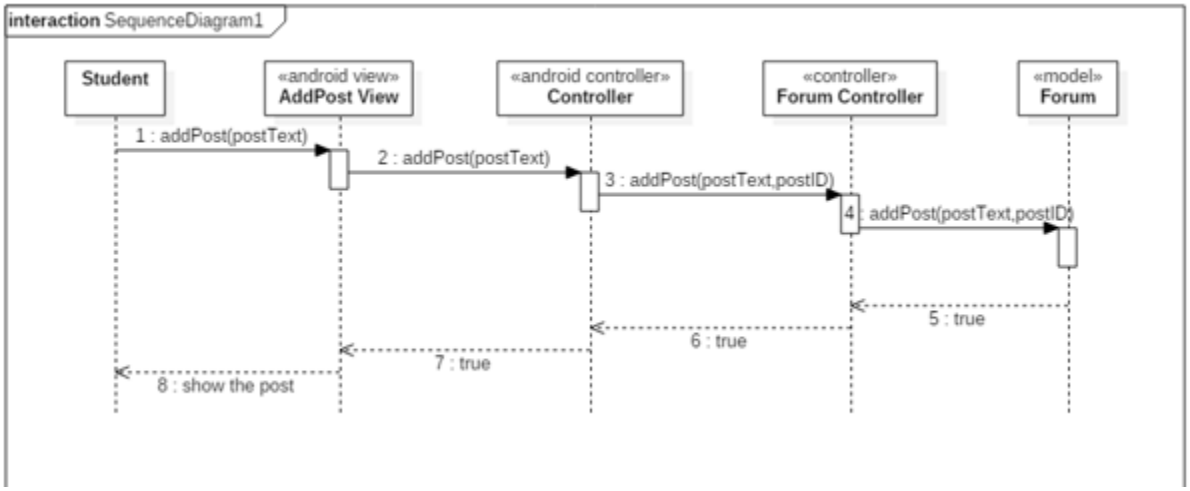

Admin Controlers
AdminCmsUsersController
AdminProfessorcourse20Controller
AdminCOurseController
AdminController
AdminTaController
AdminPrerequisitecourseController
AdminDepartmentController
AdminGroupsControllers
Home controler
AdminProfessorController
AdminTacourseController
server controlles
studentController
course conroleler
task controller
professorController
forum controller
SlotsController
TAController
PostController
Material controller

Sequence Diagrams

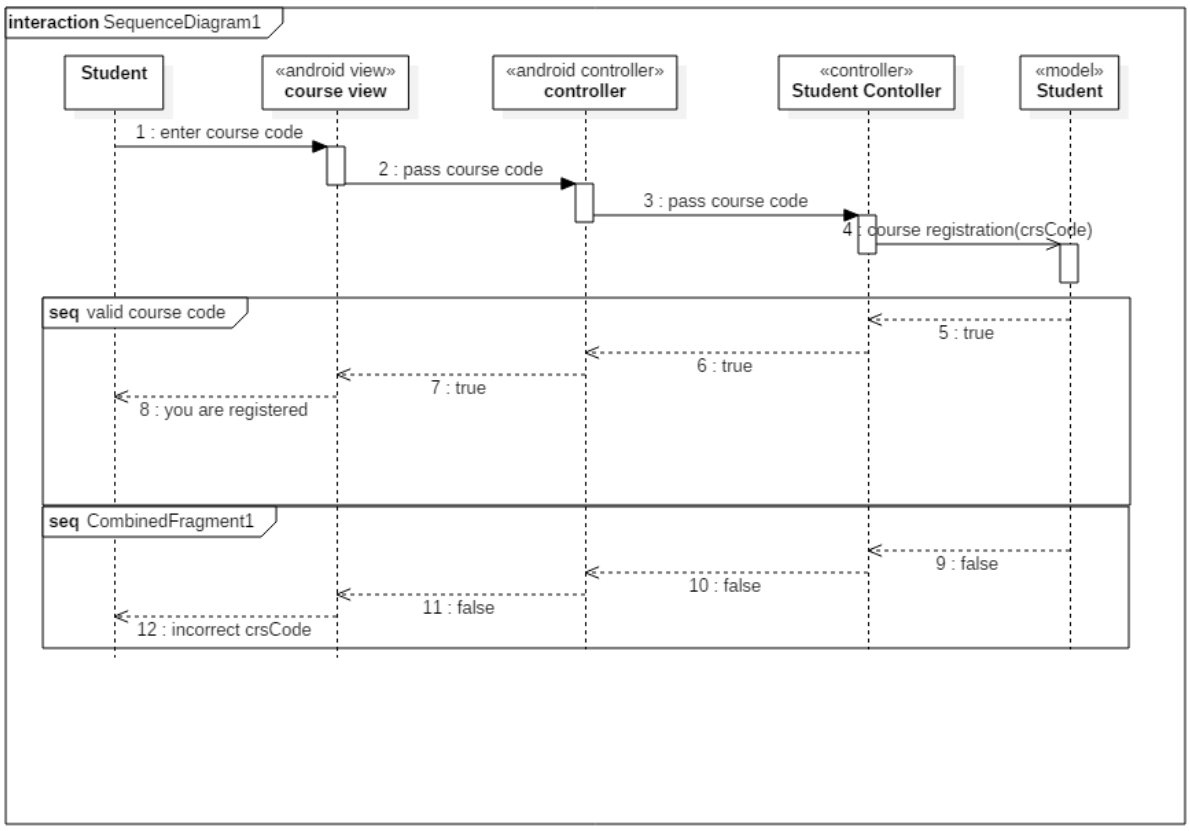
Student Login



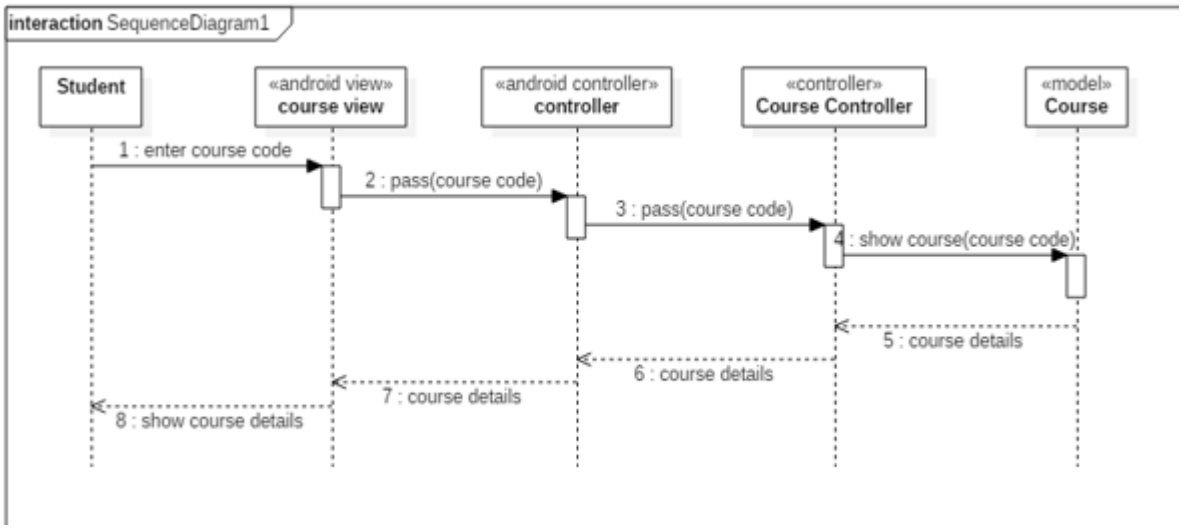
Add Post (Student)



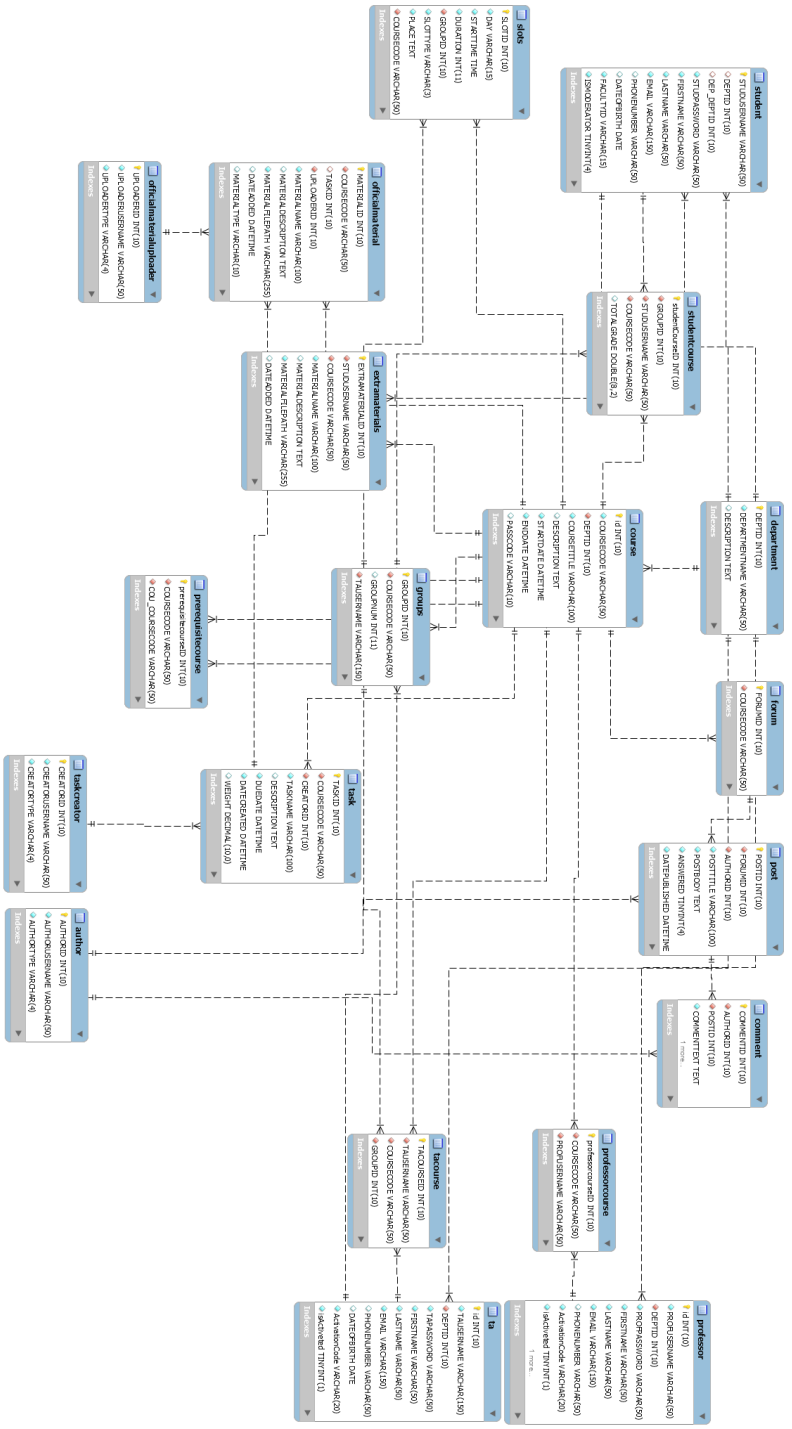
Course Registration (Student)



Show Course Details



Project ERD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DEP_DEPTID INT(10)
STUDPASSWORD VARCHAR(50)
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LASTNAME VARCHAR(50)
EMAIL VARCHAR(150)
PHONENUMBER VARCHAR(50)
DATEOFBIRTH DATE
FACULTYID VARCHAR(15)
ISMODERATOR TINYINT(4)
slots
SLOTID INT(10)
DAY VARCHAR(15)
STARTTIME TIME
DURATION INT(11)
GROUPID INT(10)
SLOTTYPE VARCHAR(3)
PLACE TEXT
COURSECODE VARCHAR(50)
officialmaterial
MATERIALID INT(10)
COURSECODE VARCHAR(50)
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MATERIALNAME VARCHAR(100)
MATERIALDESCRIPTION TEXT
MATERIALFILEPATH VARCHAR(255)
DATEADDED DATETIME
officialmaterialuploader
UPLOADERID INT(0)
UPLOADERUSERNAME VARCHAR(50)
UPLOADERTYPE VARCHAR(4)
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studentCourseID INT(10)
GROUPID INT(10)
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COURSECODE VARCHAR(50)
TOTALGRADE DOUBLE(6,2)
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EXTRAMATERIALID INT(10)
STUDUSERNAME VARCHAR(50)
COURSECODE VARCHAR(50)
MATERIALNAME VARCHAR(100)
MATERIALDESCRIPTION TEXT
MATERIALFILEPATH VARCHAR(255)
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ENDDATE DATETIME
PASSCODE VARCHAR(10)
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DEPTID INT(10)
DEPARTMENTNAME VARCHAR(50)
DESCRIPTION TEXT
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COURSECODE VARCHAR(50)
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FORUMID INT(10)
AUTHORID INT(10)
POSTTITLE VARCHAR(100)
POSTBODY TEXT
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DATEPUBLISHED DATETIME
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AUTHORID INT(10)
POSTID INT(10)
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GROUPID INT(10)
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TAUSERNAME VARCHAR(150)
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COURSECODE VARCHAR(50)
COU_COURSECODE VARCHAR(50)
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COURSECODE VARCHAR(50)
CREATORID INT(10)
TASKNAME VARCHAR(100)
DESCRIPTION TEXT
DUEDATE DATETIME
DATECREATED DATETIME
WEIGHT DECIMAL(10,0)
taskcreator
CREATORID INT(10)
CREATORUSERNAME VARCHAR(50)
CREATORTYPE VARCHAR(4)
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AUTHORID INT(10)
AUTHORUSERNAME VARCHAR(50)
AUTHORTYPE VARCHAR(4)
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TACOURSEID INT(10)
TAUSERNAME VARCHAR(50)
COURSECODE VARCHAR(50)
GROUPID INT(10)
professorcourse
professorcourseID INT(10)
COURSECODE VARCHAR(50)
PROFUSERNAME VARCHAR(50)
professor
id INT(10)
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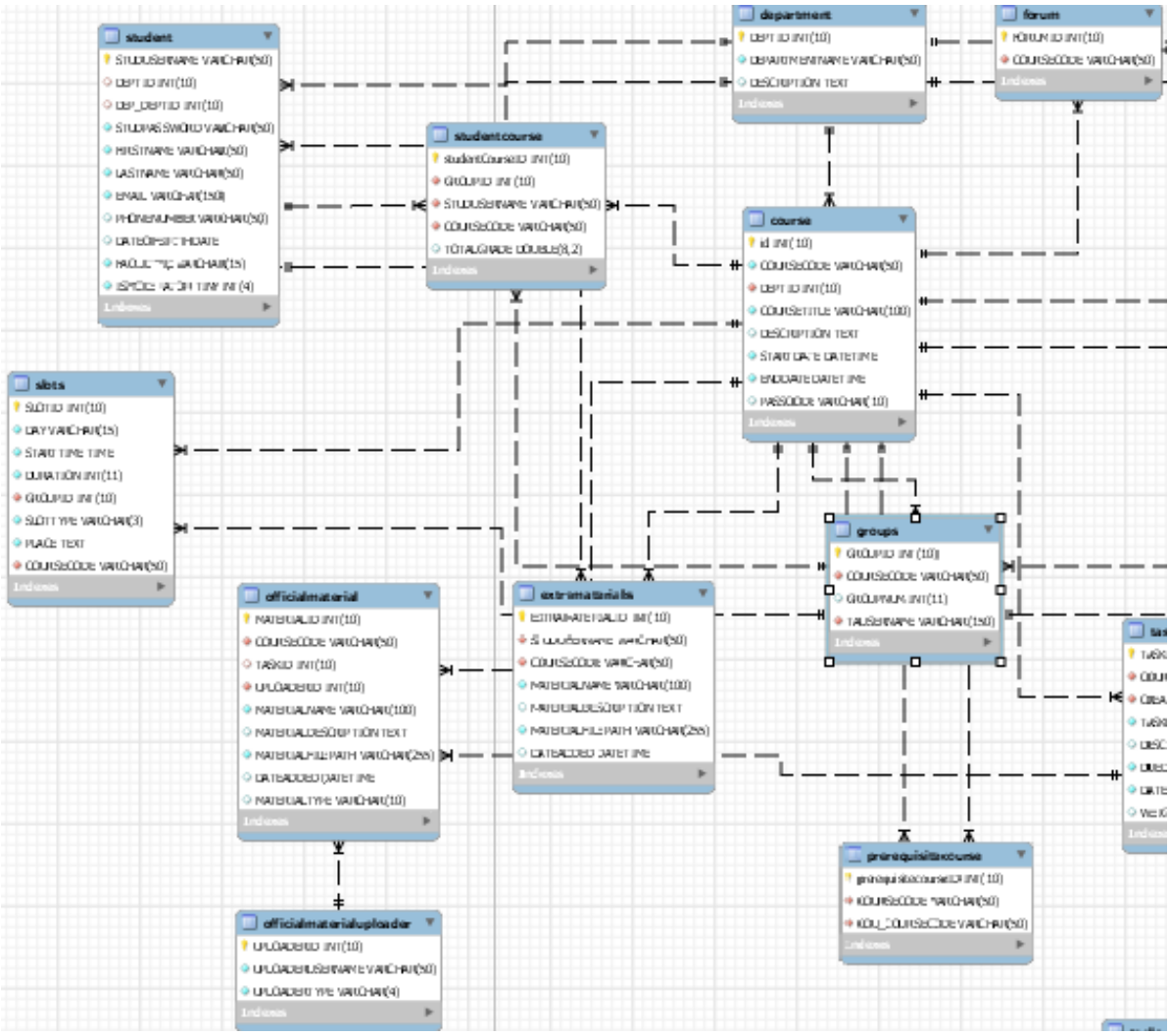
DEPTID INT(10)
PROFPASSWORD VARCHAR(50)
FIRSTNAME VARCHAR(50)
LASTNAME VARCHAR(50)
EMAIL VARCHAR(150)
PHONENUMBER VARCHAR(50)
DATEOFBIRTH DATE
ta
id INT(10)
TAUSERNAME VARCHAR(150)
DEPTID INT(10)
TAPASSWORD VARCHAR(50)
FIRSTNAME VARCHAR(50)
LASTNAME VARCHAR(50)
EMAIL VARCHAR(150)
PHONENUMBER VARCHAR(50)
DATEOFBIRTH DATE
ActivationCode VARCHAR(20)
isActivated TINYINT(1)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DEPT ID INT(10)
DEP_DEPTID INT(10)
STUDPASSWORD VARCHAR(50)
FIRSTNAME VARCHAR(50)
LASTNAME VARCHAR(50)
EMAIL VARCHAR(150)
PHONENUMBER VARCHAR(50)
DATEOFBIRTH DATE
ROLE_TYPE VARCHAR(15)
ISPOSTGRADUATE INT(4)
Indexes
department
DEPT ID INT(10)
DEPARTMENTNAME VARCHAR(50)
DESCRIPTION TEXT
Indexes
forum
FORUM ID INT(10)
COURSECODE VARCHAR(50)
Indexes
studentcourse
studentCourseID INT(10)
GROUPID INT(10)
STUDUSERNAME VARCHAR(50)
COURSECODE VARCHAR(50)
TOTALGRADE DOUBLE(8,2)
Indexes
course
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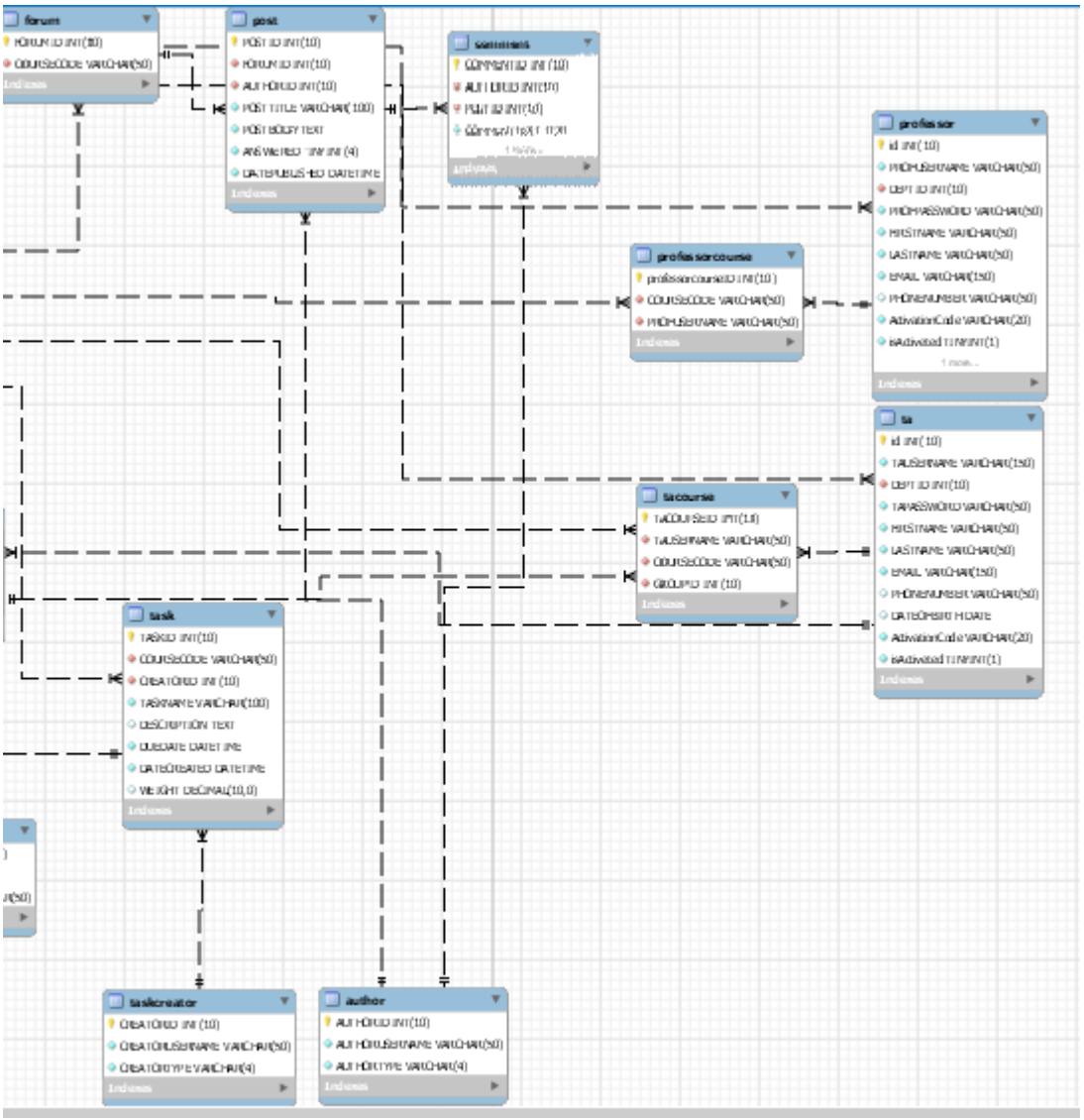
COURSECODE VARCHAR(50)
DEPT ID INT(10)
COURSETITLE VARCHAR(100)
DESCRIPTION TEXT
STARTDATE DATETIME
ENDDATE DATETIME
PASSCODE VARCHAR(10)
Indexes
slots
SLOTID INT(10)
DAY VARCHAR(15)
START TIME TIME
DURATION INT(11)
GROUPID INT(10)
SLOTTYPE VARCHAR(3)
PLACE TEXT
COURSECODE VARCHAR(50)
Indexes
groups
GROUPID INT(10)
COURSECODE VARCHAR(50)
GROUPNUM INT(11)
TASSENAME VARCHAR(150)
Indexes
officialmaterial
MATERIALID INT(10)
COURSECODE VARCHAR(50)
TASKID INT(10)
UPLOADERID INT(10)
MATERIALNAME VARCHAR(100)
MATERIALDESCRIPTION TEXT
MATERIALFILEPATH VARCHAR(255)
DATEADDED DATETIME
MATERIALTYPE VARCHAR(10)
Indexes
extramaterials
EXTRAMATERIALID INT(10)
STUDUSERNAME VARCHAR(50)
COURSECODE VARCHAR(50)
MATERIALNAME VARCHAR(100)
MATERIALDESCRIPTION TEXT
MATERIALFILEPATH VARCHAR(255)
DATEADDED DATETIME
Indexes
prerequisitecourse
prerequisitecourseID INT(10)
COURSECODE VARCHAR(50)
PREQ_COURSECODE VARCHAR(50)
Indexes
officialmaterialuploader
UPLOADERID INT(10)
UPLOADERUSERNAME VARCHAR(50)
UPLOADERTYPE VARCHAR(4)
Indexes


forum
post
professor
professorcourse
ta
tacourse
task
taskcreator
author

System GUI Design

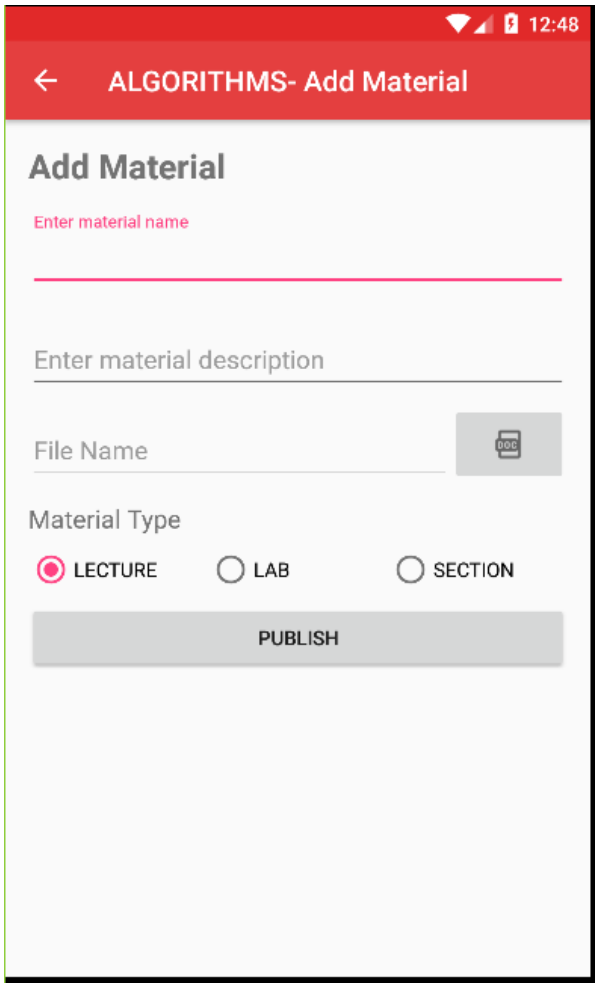


Figure 2 Add Material

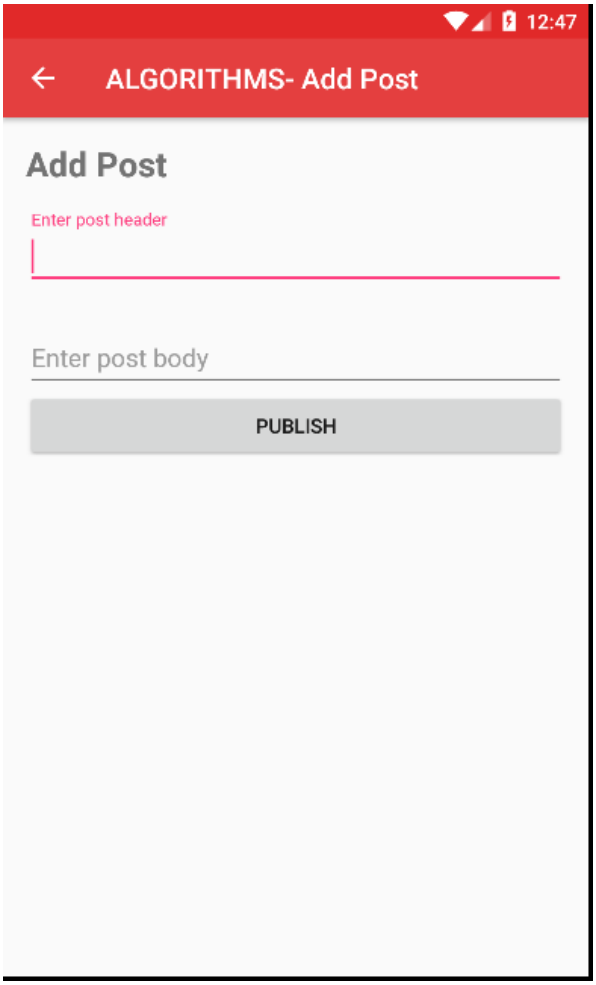


Figure 1 Add post

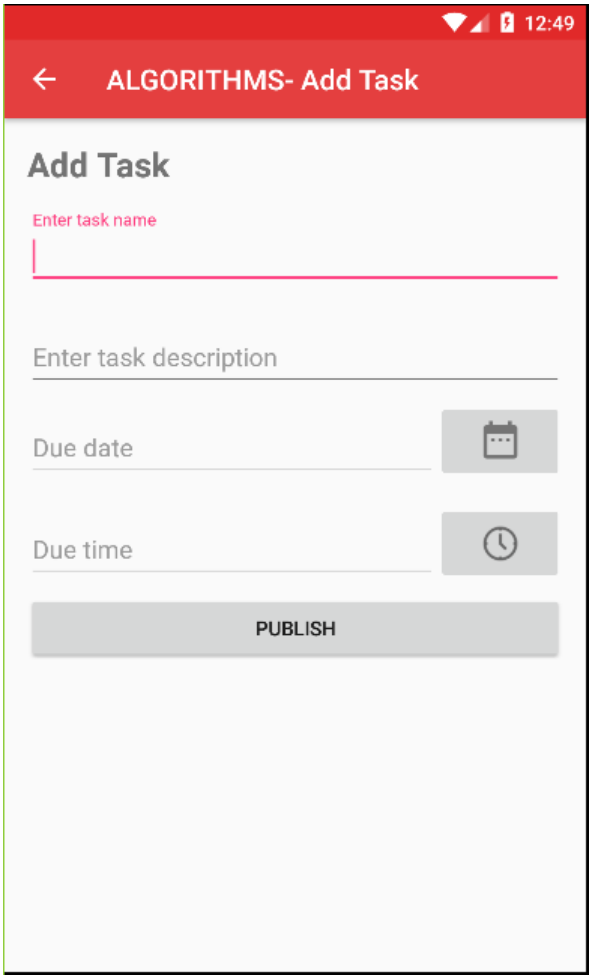


Figure 3 Add task

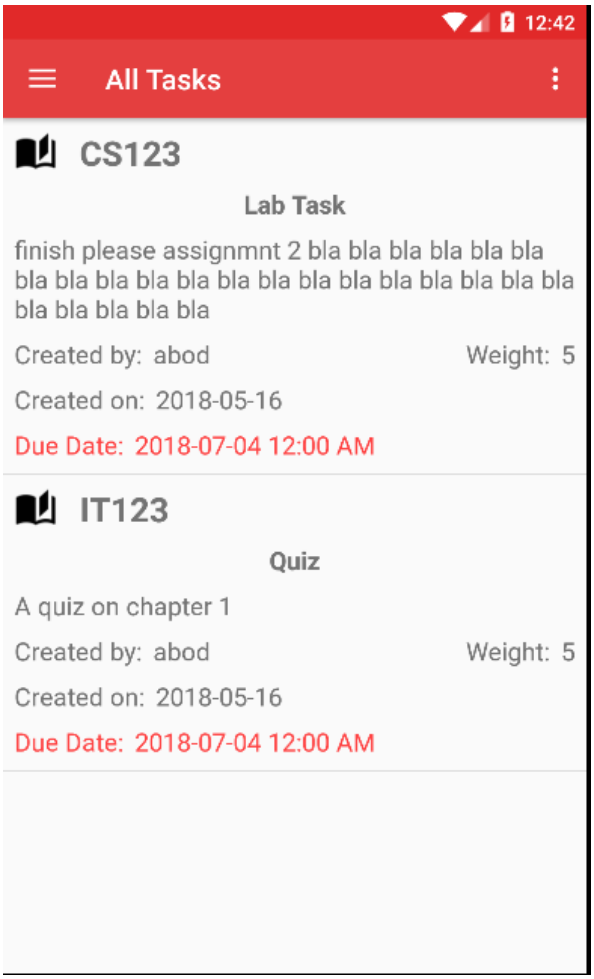


Figure 4 All tasks

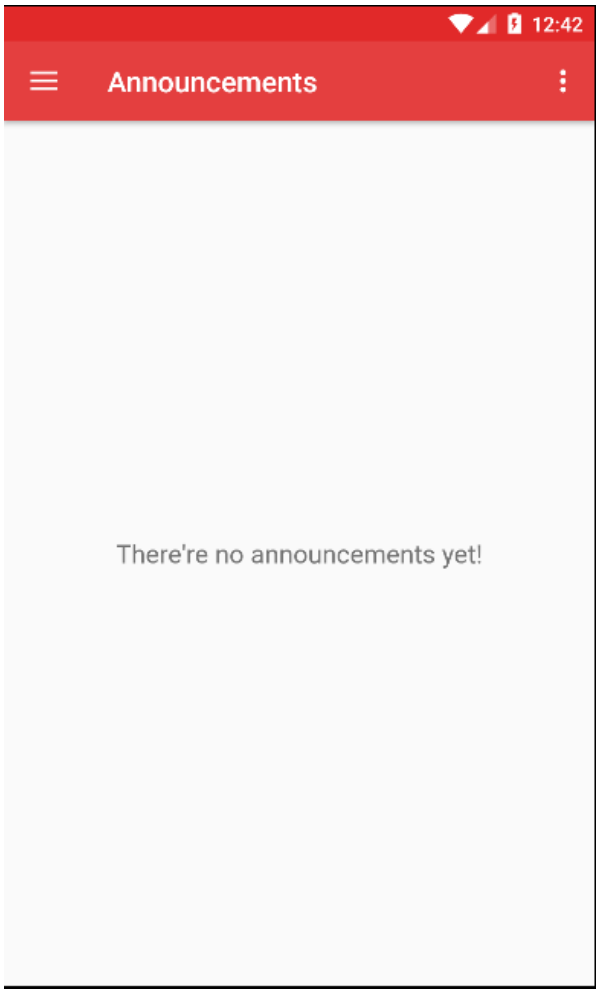


Figure 5 Announcements

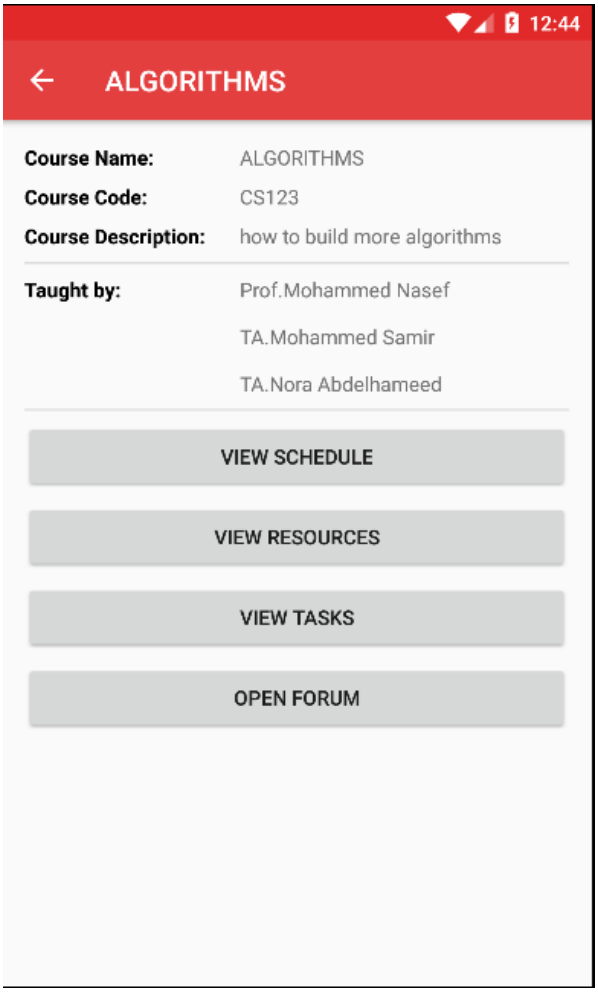


Figure 6 Course

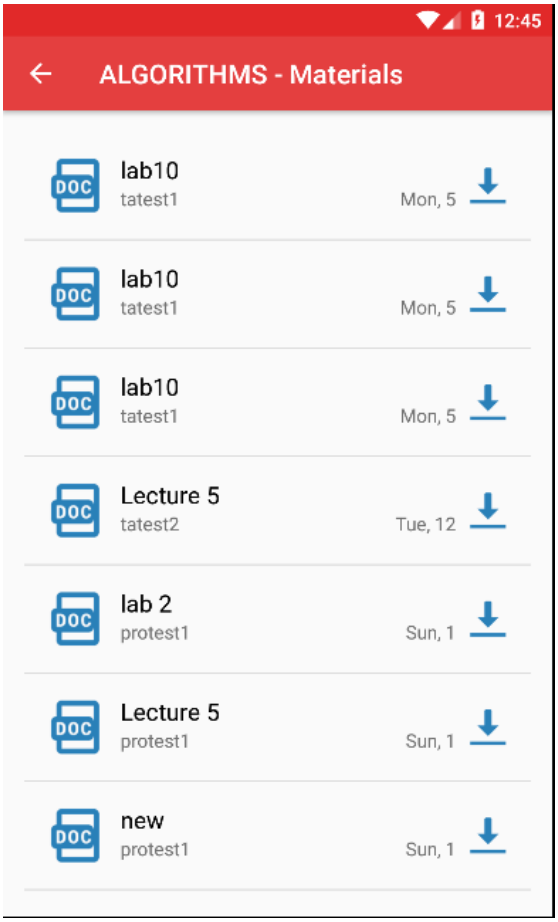


Figure 8 Materials

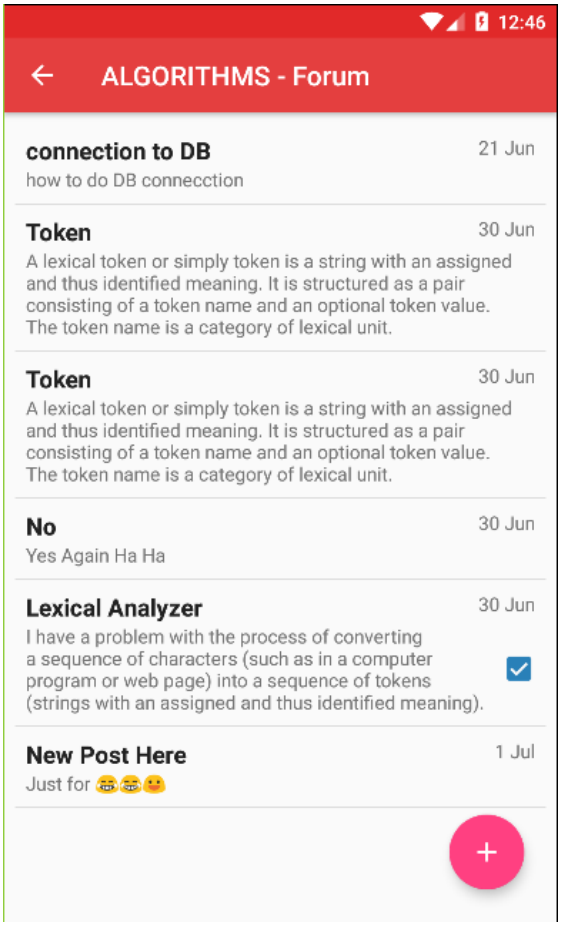


Figure 7 Course Forum

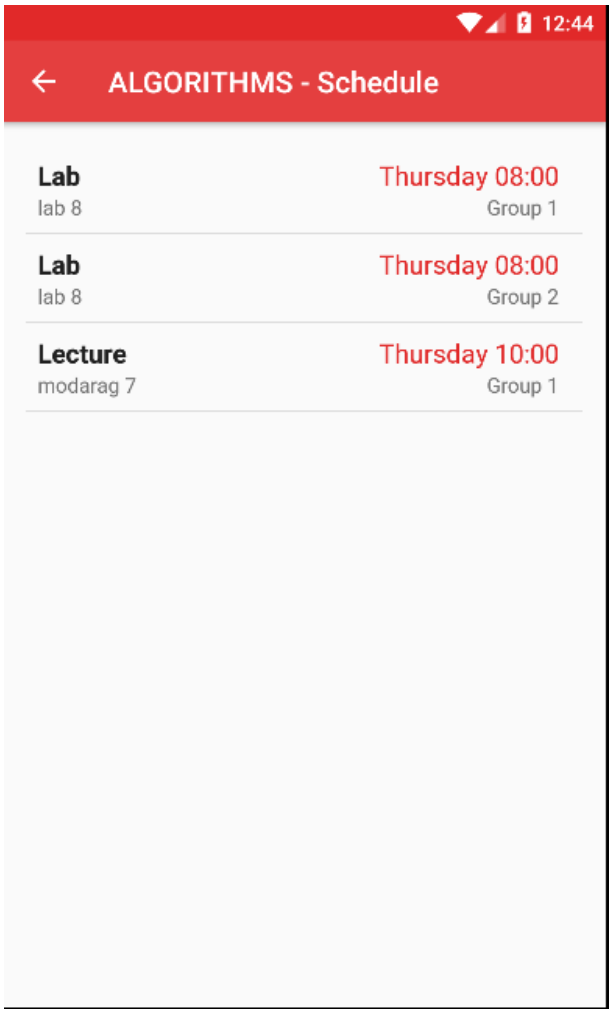


Figure 9 Course Schedule

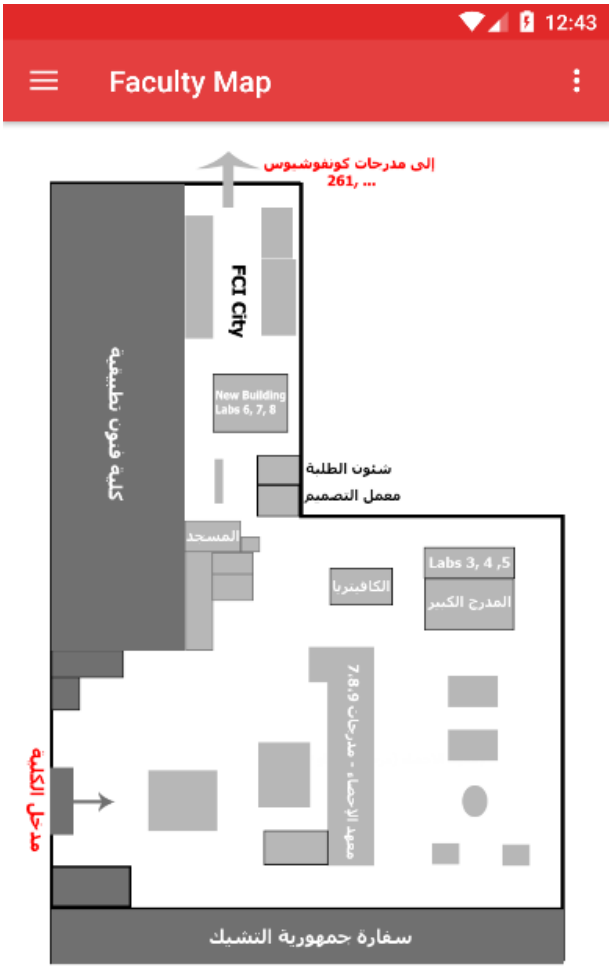


Figure 10 Static Map

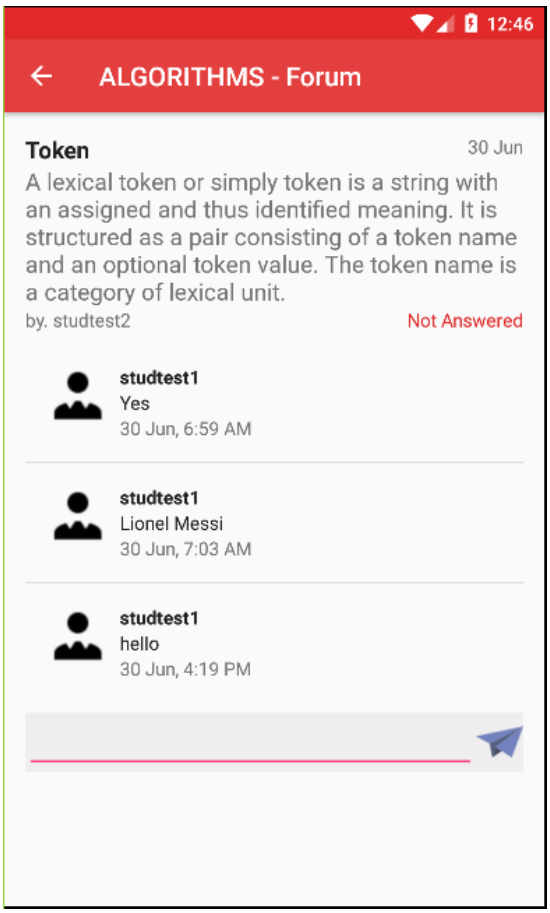


Figure 12 Forum Post

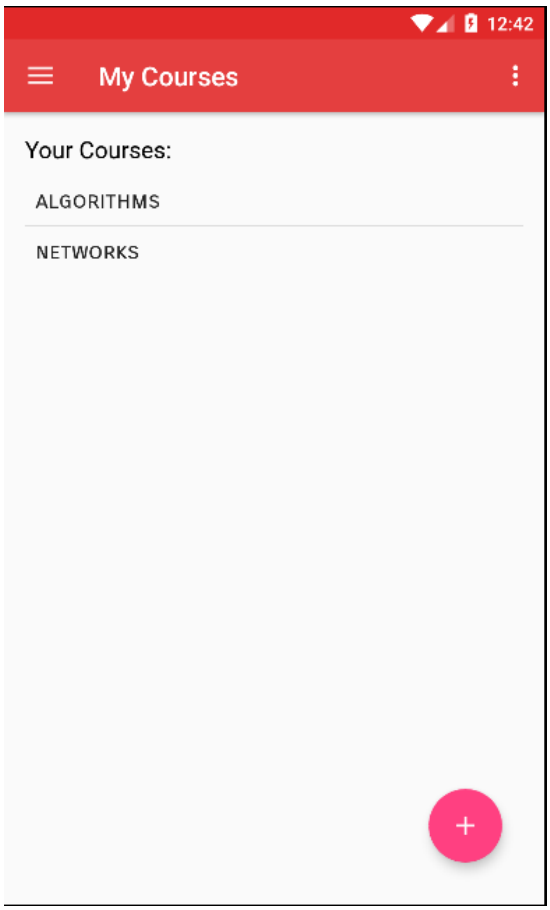


Figure 11 My Courses

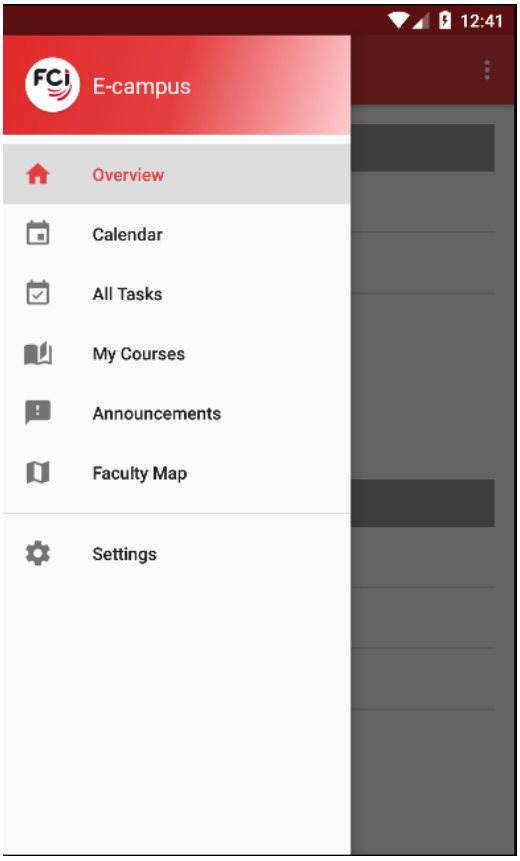


Figure 14 Navigation Drawer

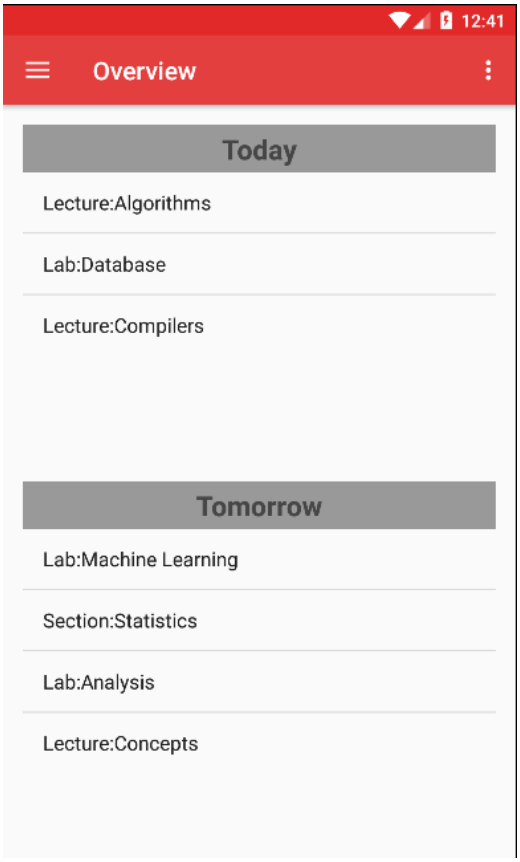


Figure 13 Overview

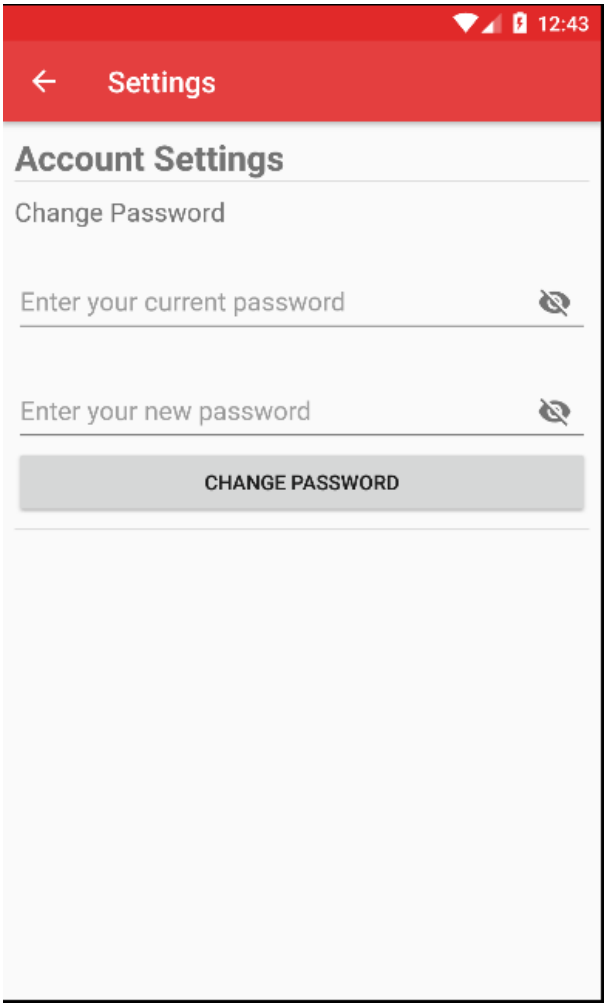


Figure 16 Settings

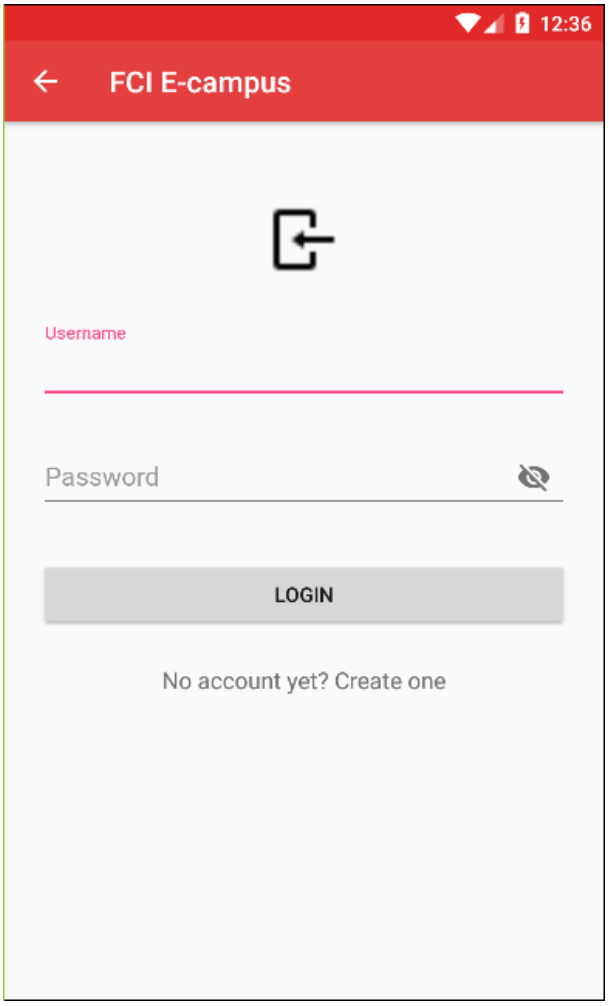


Figure 15 Login screen

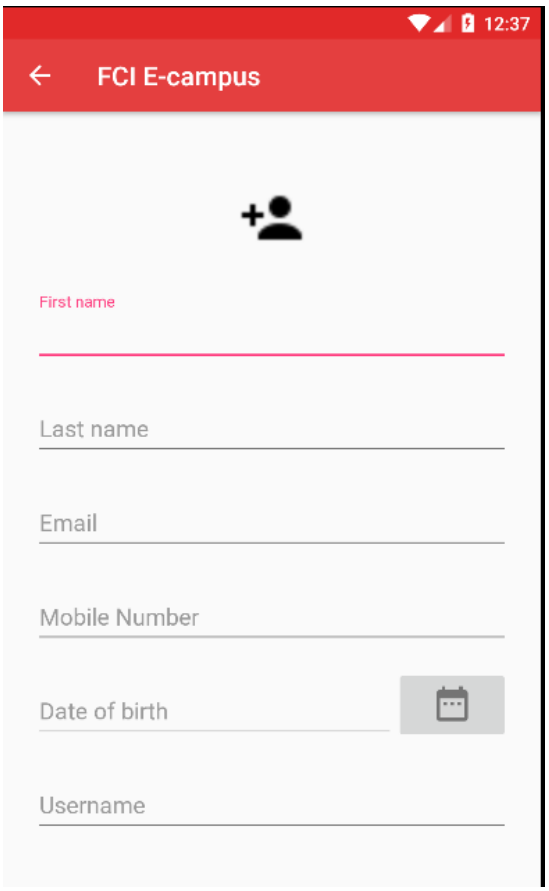


Figure 18 Student signup 1

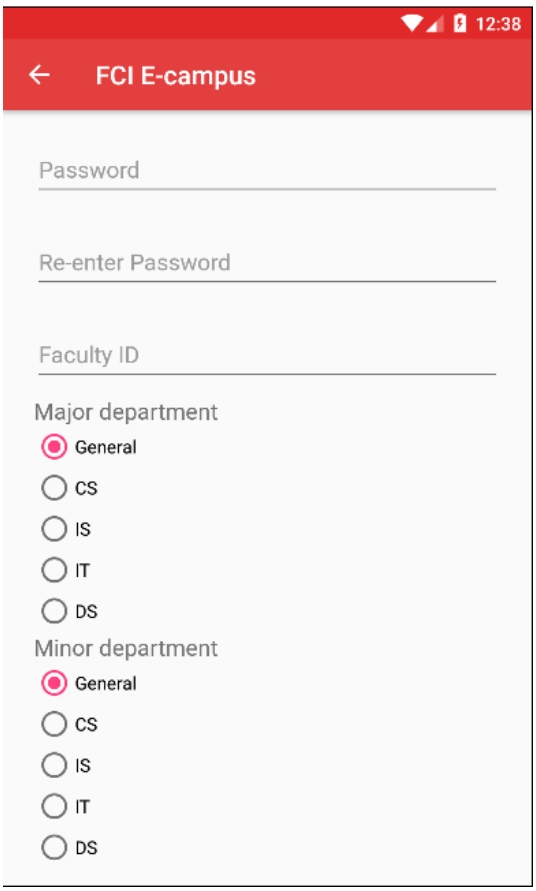


Figure 17 Student signup 2

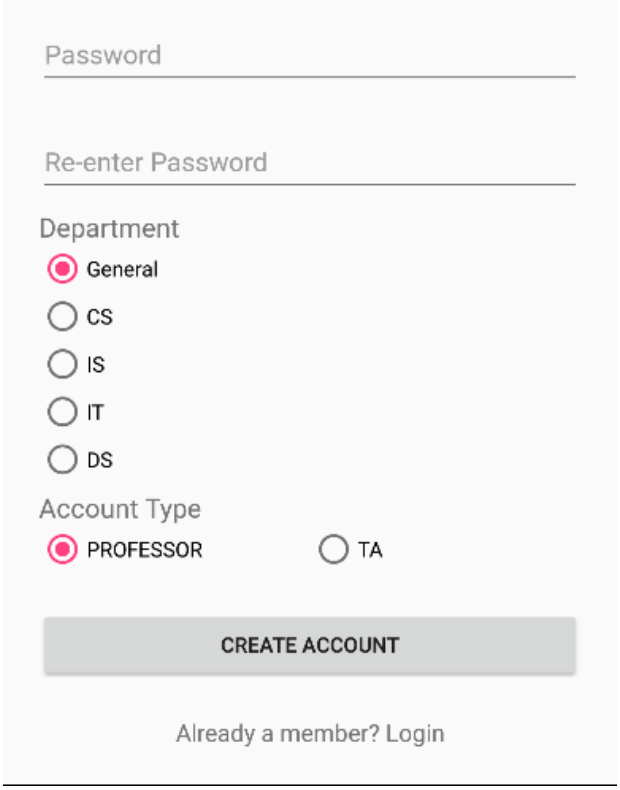


Figure 19 Teacher signup 2

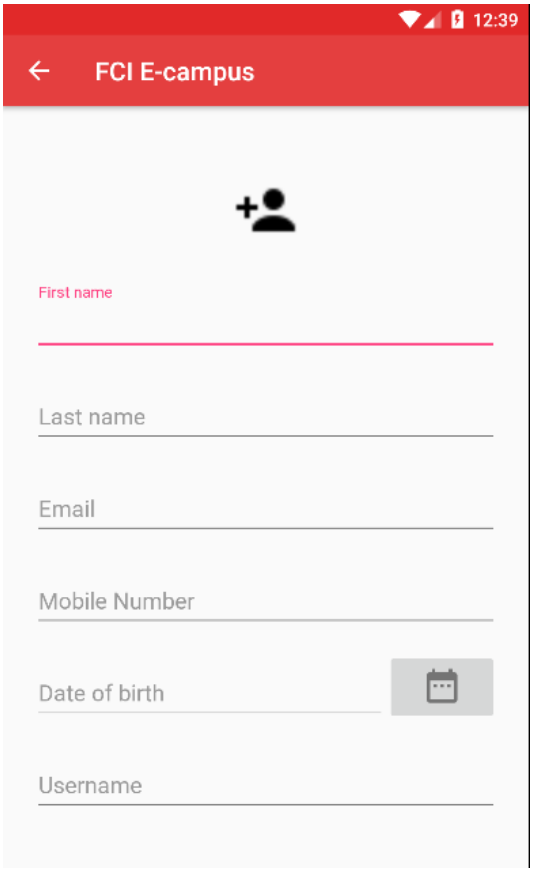


Figure 20 Teacher signup 1

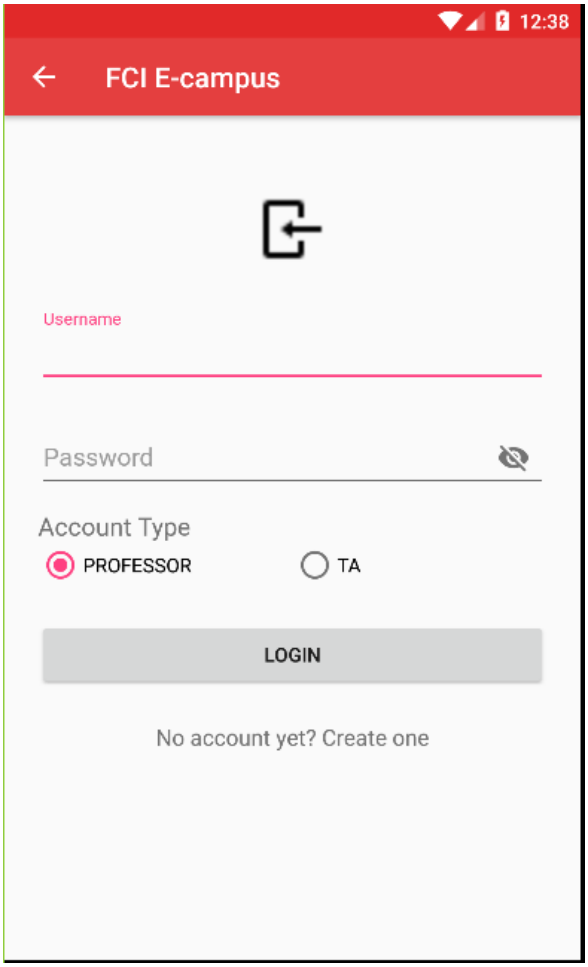


Figure 22 Teacher login

Figure 21 Welcome screen

Implementation and Testing

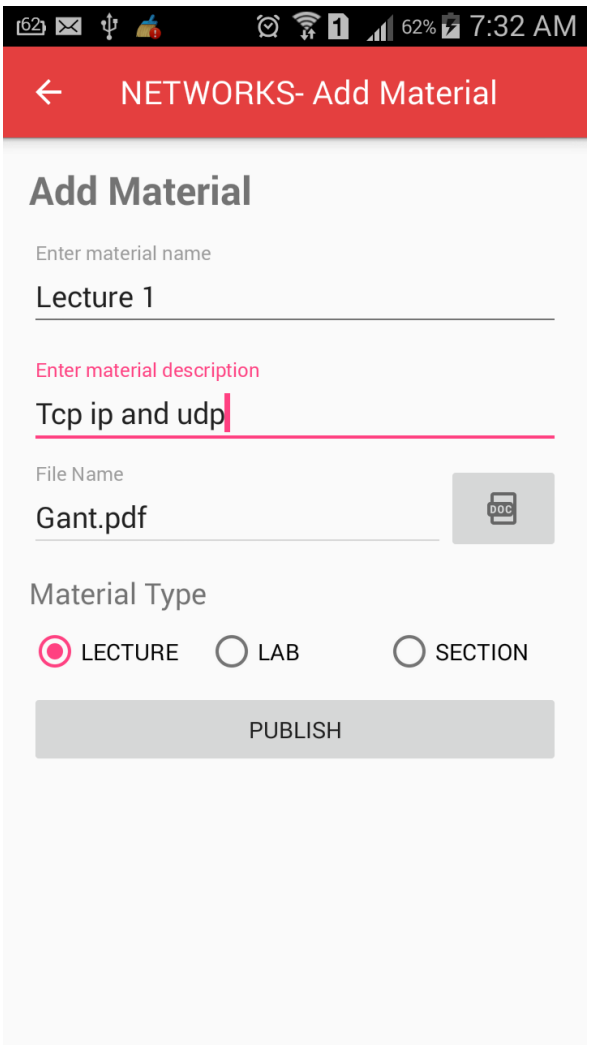


Figure 24 Add material - IN

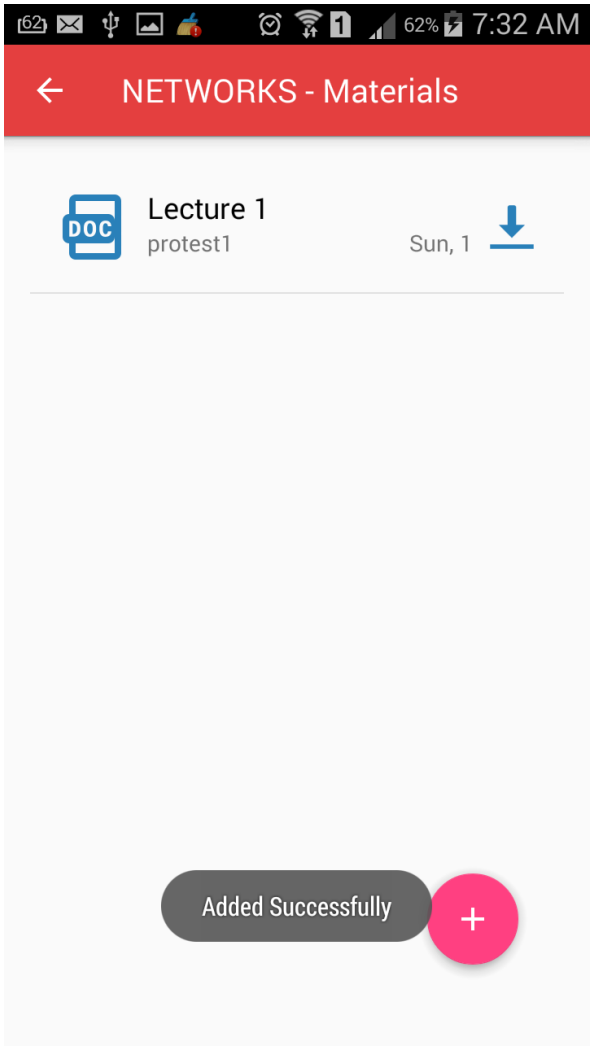


Figure 23 Add Material - OUT

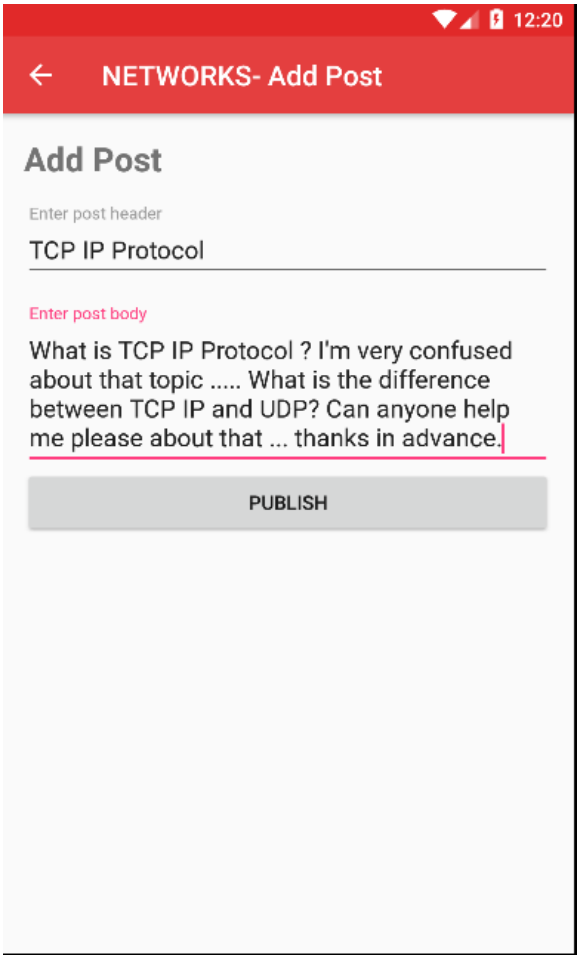


Figure 26 Add post - IN

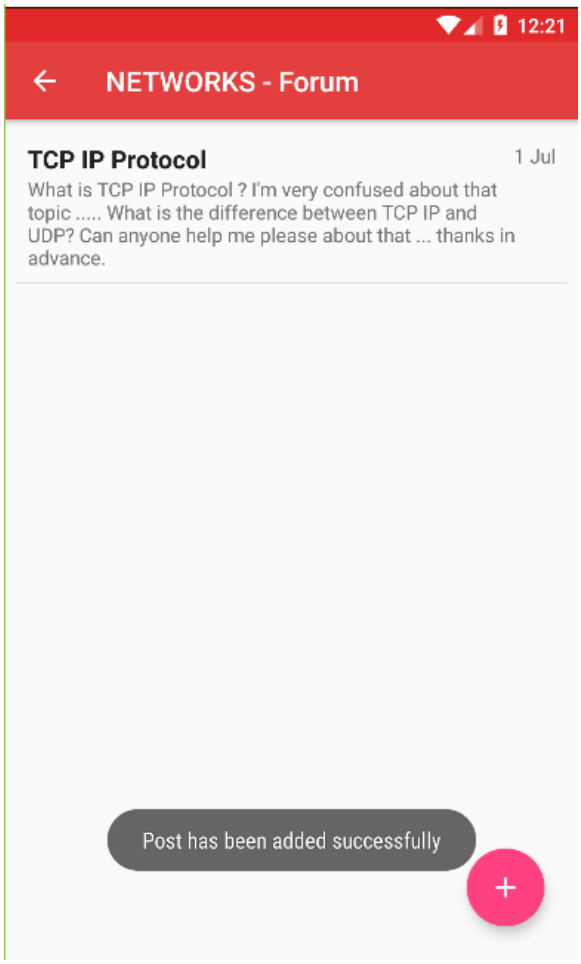


Figure 25 Add post - Out

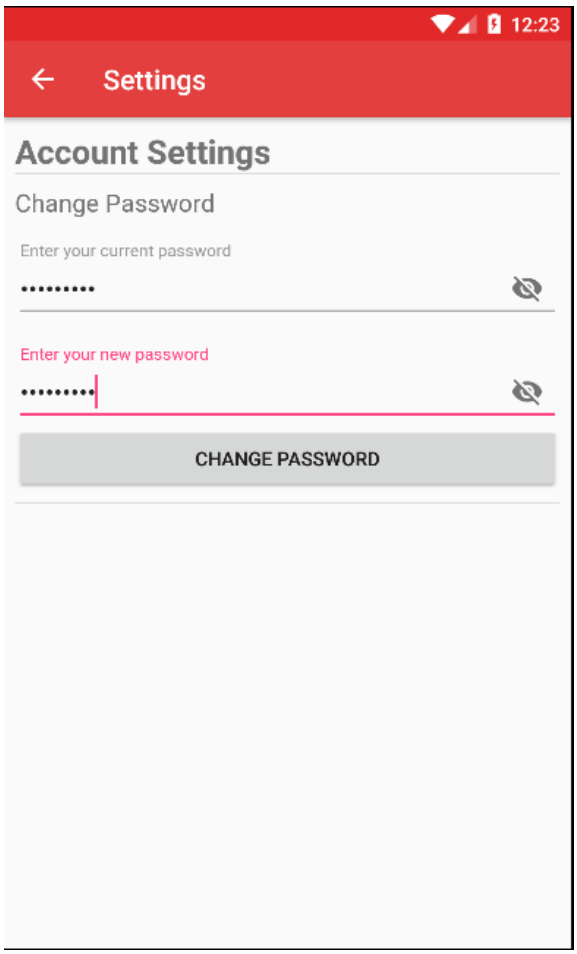


Figure 28 Change password - IN

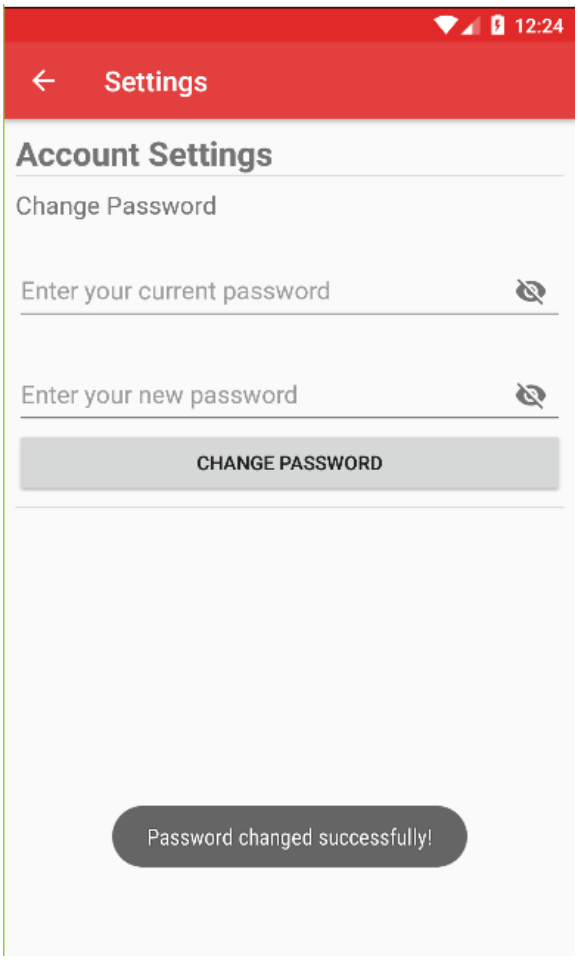


Figure 27 Change password - OUT

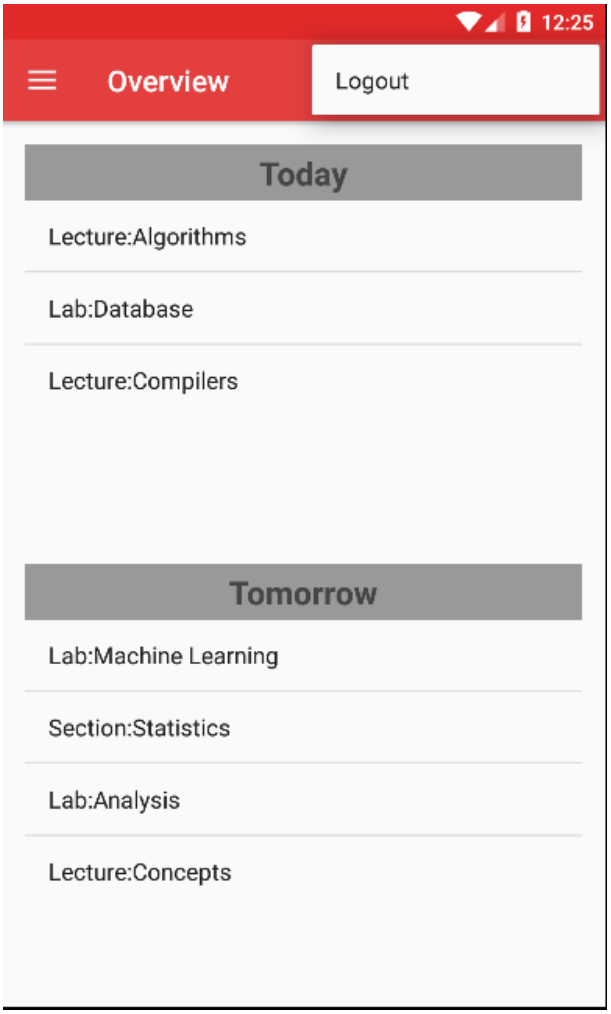


Figure 29 Logout - IN

Figure 30 Logout - OUT

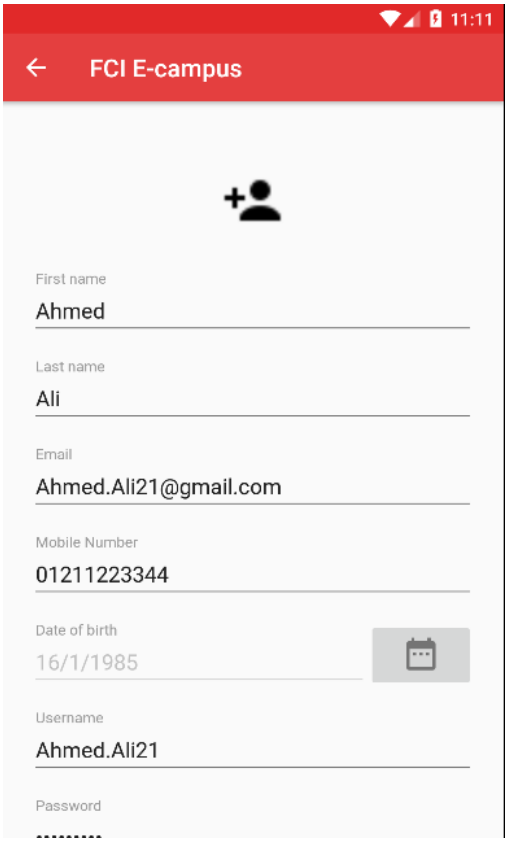


Figure 32 Professor signup 1 - IN

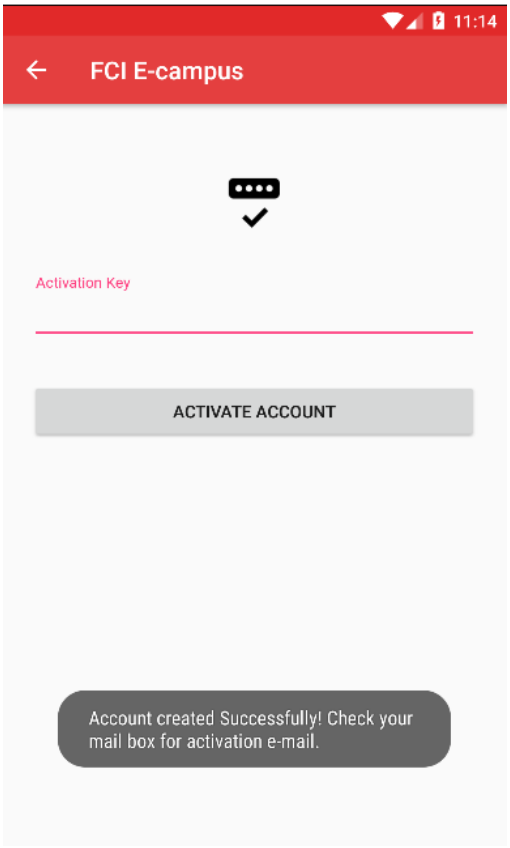


Figure 31 Professor signup - OUT

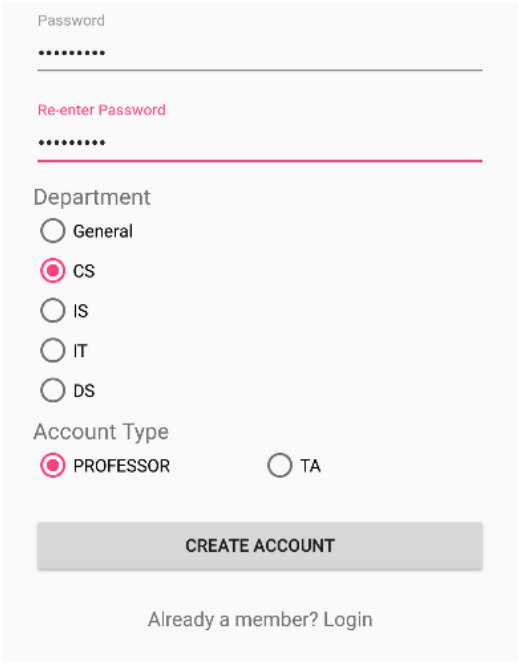


Figure 33 Professor signup 2 - IN

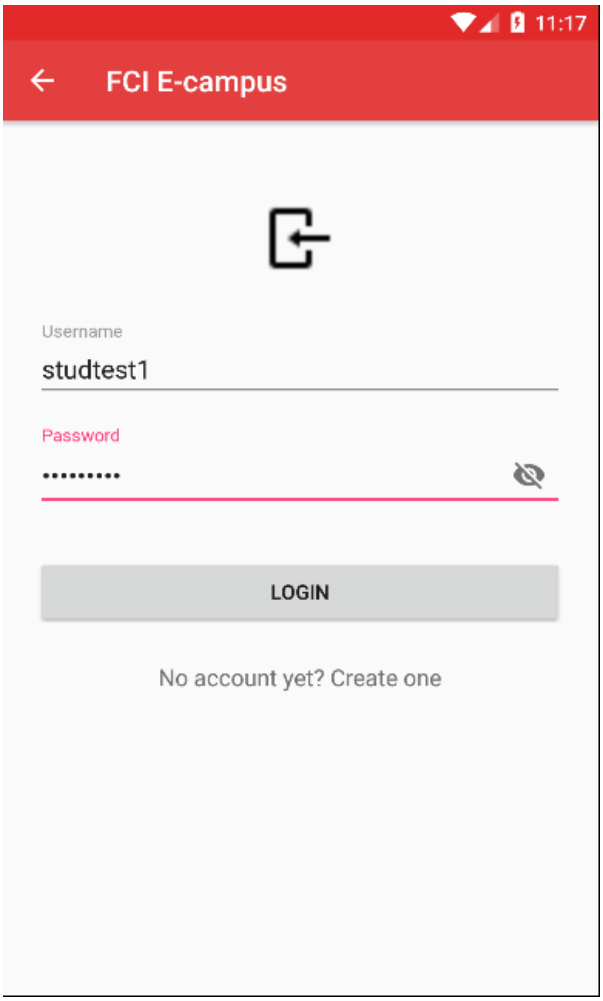


Figure 34 Student login - IN

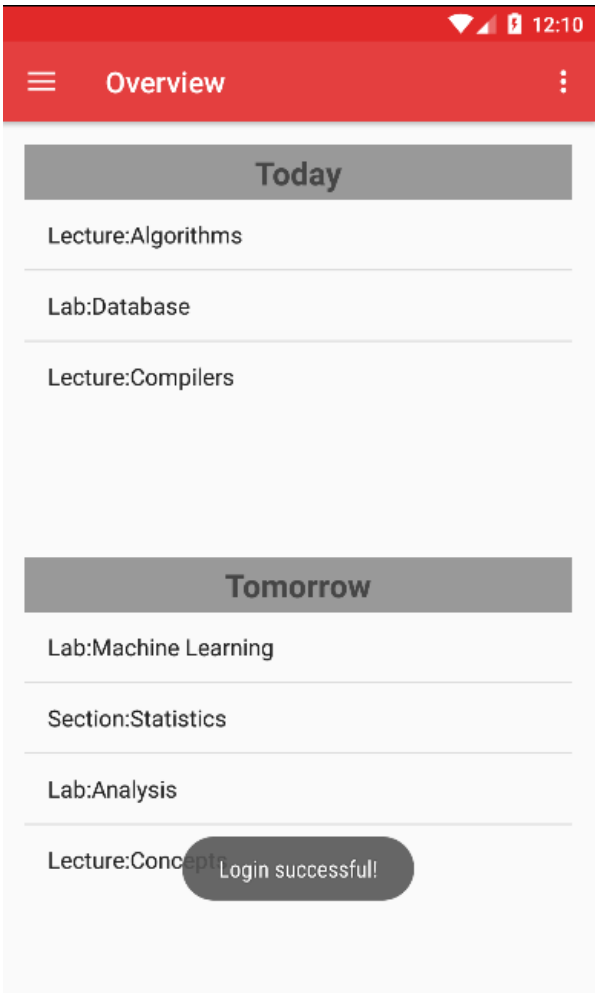


Figure 35 Student Login - OUT

FCI E-campus

Amr, Abdelrahman, Ahmed, Abdelaziz and Abdallah

Supervisor: Dr. Mohammed Nassef

Abstract

Organizing time for a faculty student is an essential part of his success. This has been always a problem with no definite solution.
The students at Faculty of Computer and Information, Cairo University are heavily distracted between many online places. Facebook groups, E-com, Acadox, GDrive and a lot more. Cluttered and unorganized, theses websites do bad to students more than they do them good. Our app is an effective solution for all the problems facing students at FCI. It combines all what they will need in a single place saving them from distraction and ad-flooded websites. Targeted for their needs, it facilitates learning and helps them focus on the more important things, i.e. learning.

Introduction

This project aims to create a mobile application that will help students & staff at FCI stay organized. The app will provide students, teacher assistants & professors with their schedule, depending on the courses they have registered. If the student doesn't know the location of his lecture or lab the app will help him and show him a map to where the lecture/section hall or lab is in the faculty.
Also, users receive new announcements from the faculty notifying them with important events happening at the faculty. To help students keep track with their courses, our app gives an overview of what is due this day and the next. It also gives them a list combining all tasks from all the courses they are registered in. The app will organize downloading and uploading materials. The app will provide a forum for the students to communicate with each other as well as with TAs and professors.

Methods

In this project we used Scrum Methodology. Scrum is an agile method for project management.

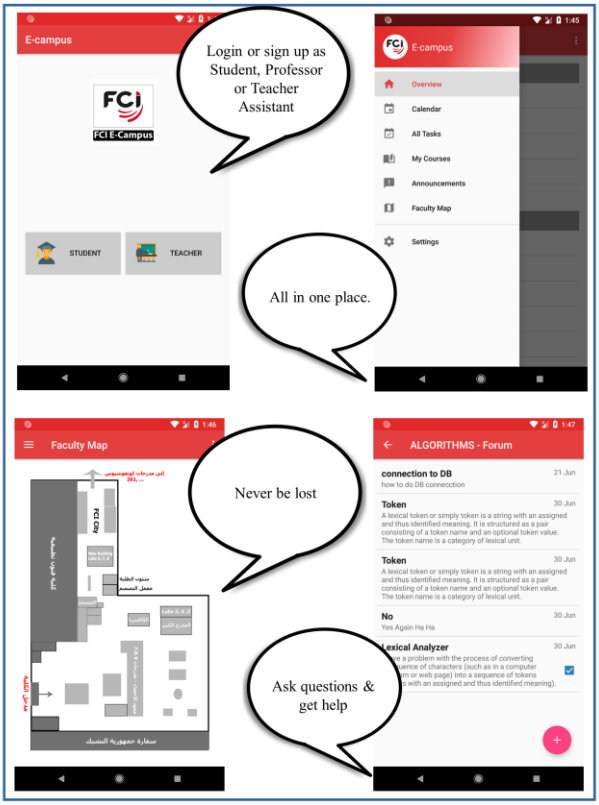
In the backend:

- Developed using the Laravel PHP framework alongside with MySQL DBMS.
- Developed with Jetbrains PhpStorm IDE and XAMPP stack.
- Deployed on Heroku which is a cloud platform-as-a-service (PAAS).

In the frontend (client):

- Android application developed using the native Android framework with Java.
- Developed with Android Studio IDE and Virtual Emulators to test our app.
- Published with the Google PlayStore console.

Scrum Values



PlayStore: @FCI E-campus
GitHub: https://github.com/FCI-E-campus

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