CME 3202 - Concepts of Programming Languages

Project Report

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Lecturers

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İzmir

A)Project Requirements

The main things that should be in the project;
-Login: We must have two types of user profiles, student and teacher. These two types of users can log in to CENGOnline course management system.
-Courses: While we give teachers the right to add / edit / delete lessons, we should only give students the right to view the courses they are enrolled in.
-Assignments: Teachers should be able to add / edit / delete assignments and view works submitted by students. Students should only be able to view assignments and upload their work.
-Announcements: Teachers should be able to add / edit / delete announcements. Students should only be able to view announcements.
-Messaging: All system users should be able to send individual messages to each other.
-Stream: Each lesson must have its own flow. Students and teachers of the course should be able to communicate using posts and comments on the publication page. Teachers should be able to add / edit / delete posts. Teachers and students should be able to post comments in response to a post.

This project should be written using Java language and designed as an OOP. Inheritance, Abstract data type, Foreach loop, Switch-case condition, Named constants, Associative Arrays, Method Overloading these structures should be used in the project.

1) IDE

Since we decided to develop an Android Mobile Application, we wanted to choose an IDE that would make our job easier. We wanted to choose an IDE that makes work easier with many features such as debugging, version control, Syntax error or syntax autocomplete. We chose Android Studio as we will use the Java language and develop Android.

The most important pulses that led us to choose Android Studio are:
It provides built-in support for Google Cloud. It has an emulator for all devices and android versions. It includes Github integration and ready-made templates. Provides UML diagram support. It has its own virtual device (emulator).

2) Data Repository Preference

SQLite Database is chosen to keep the data. The reasons we prefer the Database;
No capacity problems, usage, and access to data are very easy, consistency, greater data integrity provision, improved data security, reduced data entry and storage, and retrieval costs. And SQLite is chosen because of the abundance of online resources and also it is easy to manipulate such as creating tables and accessing asked data.

Tables we created in the database:
User_Table to store user information. Courses_Table to store course information. Std_Course_Table for the student to enroll in the course. Announcement_Table to store announcement data. Assignments_Table to store assignment information data. Assignments_Answer_Table to keep returning homework data. Message_Table for

messaging. Posts_Table for storing posts by teachers. Comments_Table for storing comments on posts.
What we keep in the User Table; email, password, user type.
What we keep in Course Table; course code, course name, lecturer email.
What we store in Std (Student) Course Table; course code, course name, student email.
What we keep in Announcement Table; subject, content, lecturer mail.
What we store in the Assignment Table; course code, description, lecturer mail.
What we store in the Assignment Answer Table; course code, description (of assignment), answer, student email.
What we store in the Message Table; sender email, receiver email, message.
What we store in Posts Table; course code, teacher email, post.
Comments What we store in Table; course code, commentator email, comment, postID.
And we have Delete, Get, Check statuses for these tables.

3)Libraries Used

In this plan, some libraries are used for our purpose. Some of the most important of them are listed below:

```
import java.util.ArrayList;
import java.util.HashMap;
import java.util.Map;
```

They are used for store data in a more efficient way.

```
import android.view.View;
import android.widget.AdapterView;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ListView;
import android.widget.TextView;
```

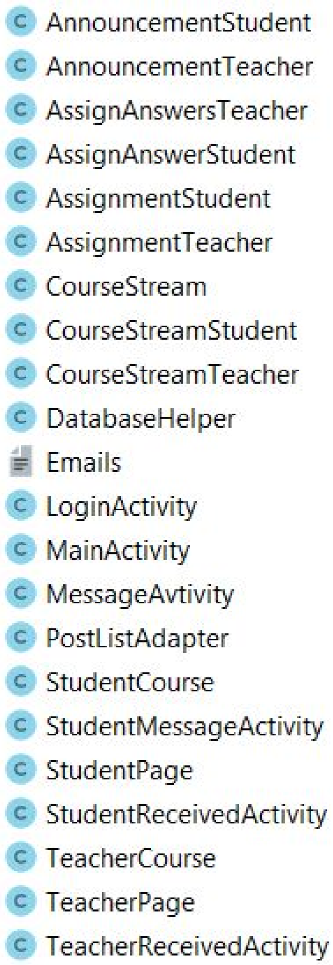
Those are for our UI design components we need to use in the project.

```
import android.content.Intent;
```

This is one of the most crucial imports because intent provides us to jump to the next activity.

4)Classes

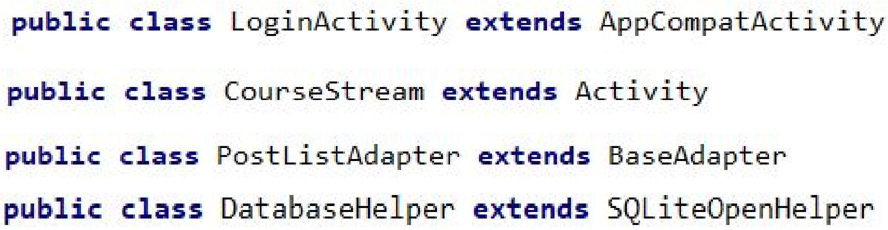
In the project, there are a bunch of classes to provide features that we want. Most of them are activity classes and some of them are helper classes to main features.



- AnnouncementStudent
- AnnouncementTeacher
- AssignAnswersTeacher
- AssignAnswerStudent
- AssignmentStudent
- AssignmentTeacher
- CourseStream
- CourseStreamStudent
- CourseStreamTeacher
- DatabaseHelper
- Emails
- LoginActivity
- MainActivity
- MessageAvtivity
- PostListAdapter
- StudentCourse
- StudentMessageActivity
- StudentPage
- StudentReceivedActivity
- TeacherCourse
- TeacherPage
- TeacherReceivedActivity

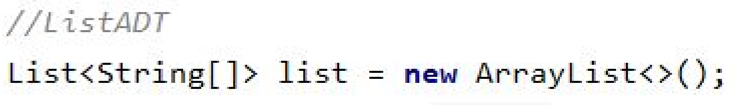
There was a necessity to split almost every activity two-part as AnnouncementStudent and AnnouncementTeacher, they are the same announcement activity but here the teacher has some extra events like posting announcements. PostListAdapter and DatabaseHelper are helper classes to use some features about reaching data from the database and list them in the activity classes.

5) Inheritance



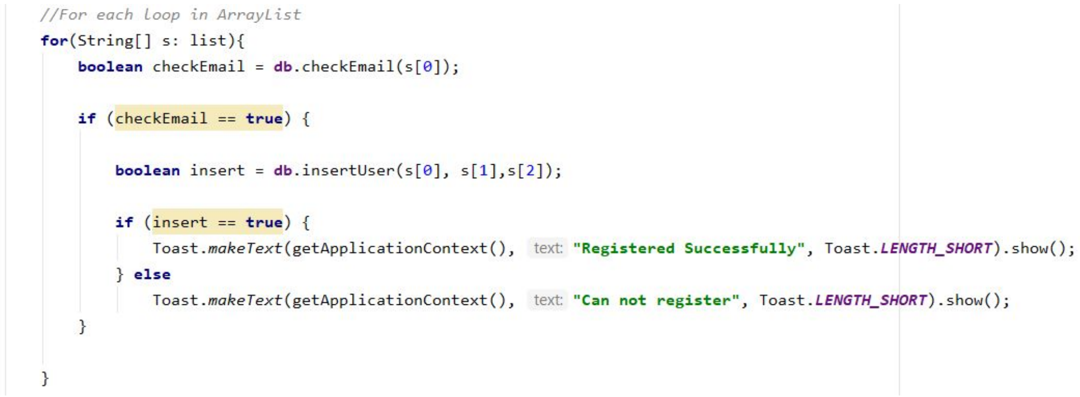
```
public class LoginActivity extends AppCompatActivity

public class CourseStream extends Activity

public class PostListAdapter extends BaseAdapter

public class DatabaseHelper extends SQLiteOpenHelper
```

6) Abstract data type



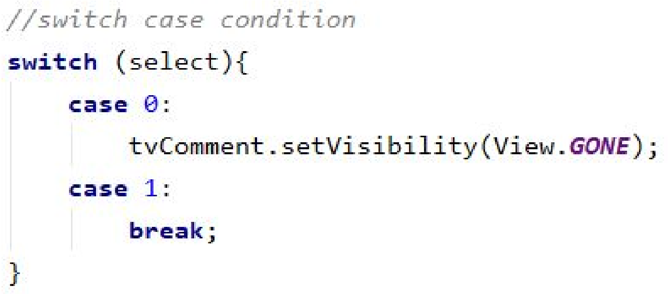
```
//ListADT
List<String[]> list = new ArrayList<>();
```

7) Foreach loop



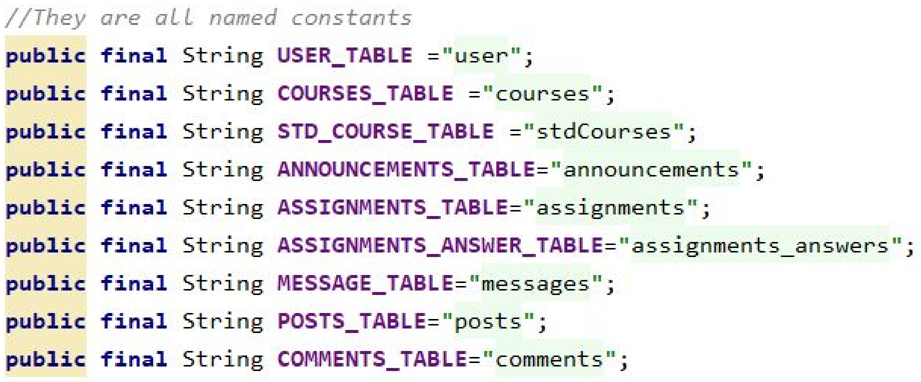
```
//For each loop in ArrayList
for(String[] s: list){
    boolean checkEmail = db.checkEmail(s[0]);

    if (checkEmail == true) {

        boolean insert = db.insertUser(s[0], s[1],s[2]);

        if (insert == true) {
            Toast.makeText(getApplicationContext(),  text: "Registered Successfully", Toast.LENGTH_SHORT).show();
        } else
            Toast.makeText(getApplicationContext(),  text: "Can not register", Toast.LENGTH_SHORT).show();
    }

}
```

8) Switch-case condition



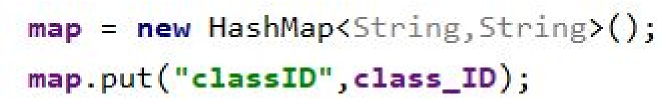
```
//switch case condition
switch (select){
    case 0:
        tvComment.setVisibility(View.GONE);
    case 1:
        break;
}
```

9) Named constants



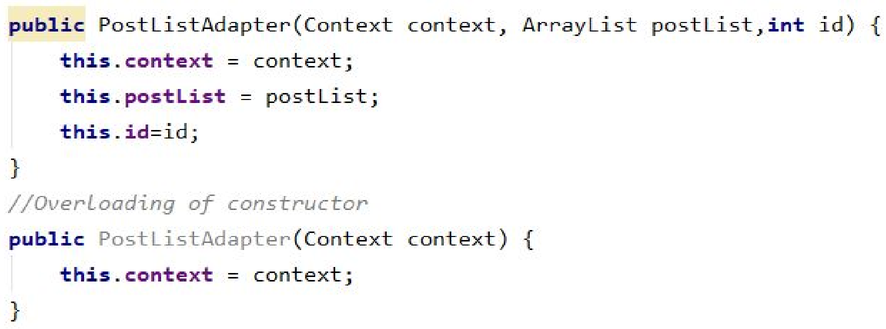
```
//They are all named constants
public final String USER_TABLE ="user";
public final String COURSES_TABLE ="courses";
public final String STD_COURSE_TABLE ="stdCourses";
public final String ANNOUNCEMENTS_TABLE="announcements";
public final String ASSIGNMENTS_TABLE="assignments";
public final String ASSIGNMENTS_ANSWER_TABLE="assignments_answers";
public final String MESSAGE_TABLE="messages";
public final String POSTS_TABLE="posts";
public final String COMMENTS_TABLE="comments";
```

10) Associative Arrays



```
map = new HashMap<String,String>();
map.put("classID",class_ID);
```

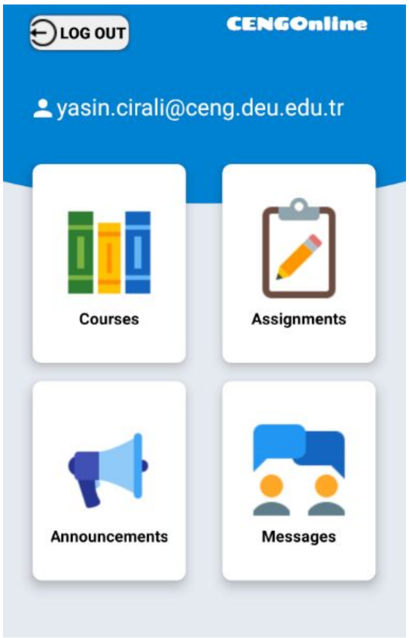
11) Method Overloading

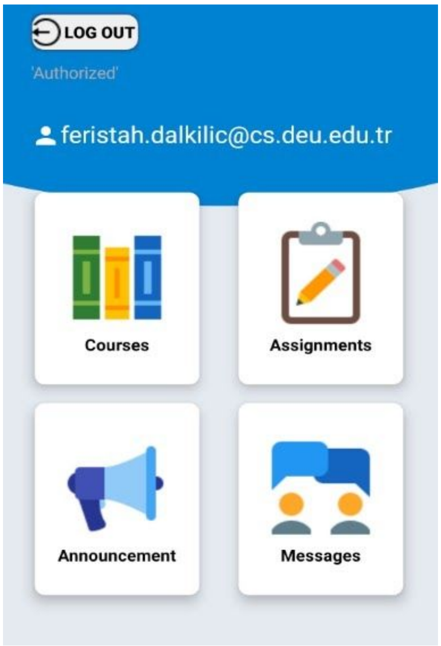


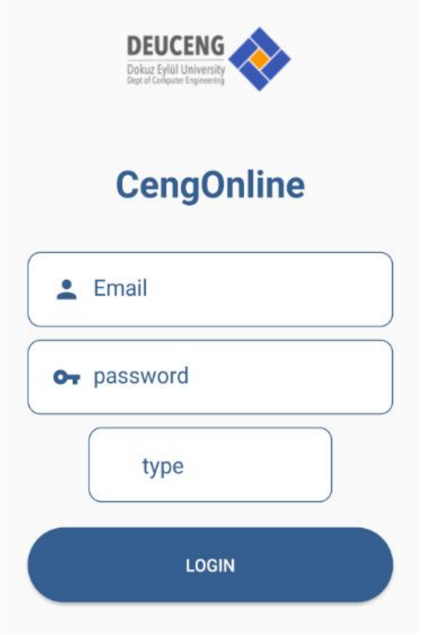
```
public PostListAdapter(Context context, ArrayList postList,int id) {
    this.context = context;
    this.postList = postList;
    this.id=id;
}
//Overloading of constructor
public PostListAdapter(Context context) {
    this.context = context;
}
```

B) UI

-Login Page:
The informations which is user entered in login page are controlled if it is matched with the datas in database and if it verified that as correct, then user is led to the profile homepage.

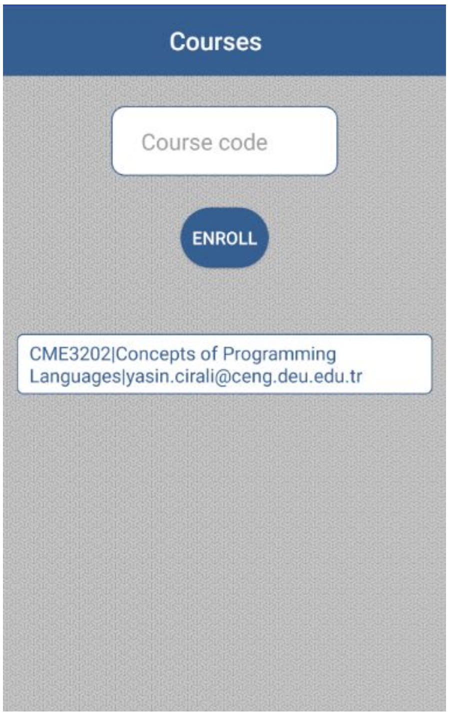




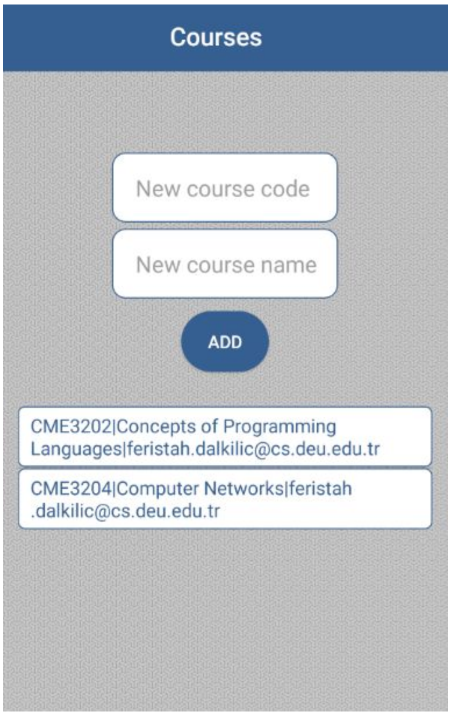


Homepage is the page which includes all of the properties and functionalities. Also , teacher-page, is specified as 'authorized' and besides these ,If logout button is clicked, user is led to the login page.

-Courses:



CME3202|Concepts of Programming Languages|yasin.cirali@ceng.deu.edu.tr

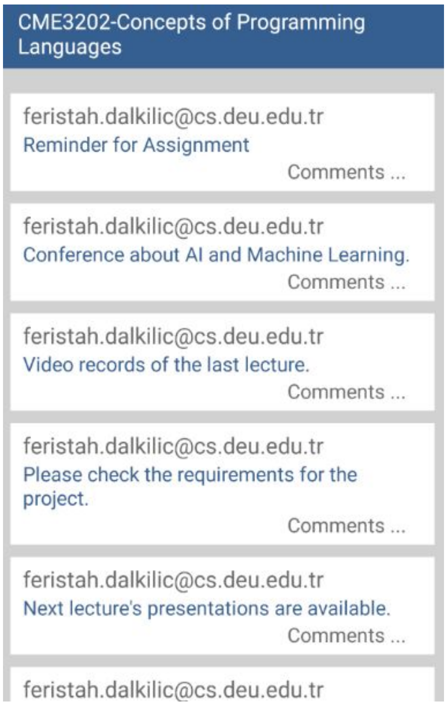


CME3202|Concepts of Programming Languages|feristah.dalkilic@cs.deu.edu.tr

CME3204|Computer Networks|feristah .dalkilic@cs.deu.edu.tr

In this page, there are two sort of course page : a course registration page for the students and the other is for the teachers to add course. Also, the courses that is added or registered are listed on this page. The course can be deleted if it is clicked on listed courses long. If it is clicked one time, it is led to the course stream page. If a course is wanted to enroll by a student but there is no course has that entered code, system does not allow to enroll that course.

-Course Stream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feristah.dalkilic@cs.deu.edu.tr
Reminder for Assignment
Comments ...

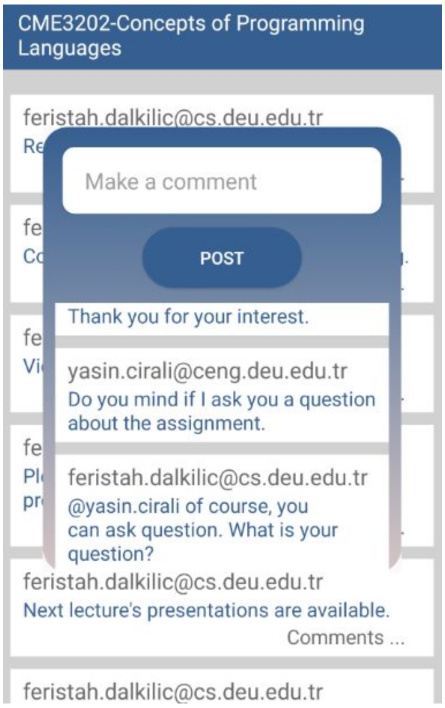
feristah.dalkilic@cs.deu.edu.tr
Conference about AI and Machine Learning.
Comments ...

feristah.dalkilic@cs.deu.edu.tr
Video records of the last lecture.
Comments ...

feristah.dalkilic@cs.deu.edu.tr
Please check the requirements for the project.
Comments ...

feristah.dalkilic@cs.deu.edu.tr
Next lecture's presentations are available.
Comments ...

feristah.dalkilic@cs.deu.edu.tr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feristah.dalkilic@cs.deu.edu.tr

Thank you for your interest.

yasin.cirali@ceng.deu.edu.tr
Do you mind if I ask you a question about the assignment.

feristah.dalkilic@cs.deu.edu.tr
@yasin.cirali of course, you can ask question. What is your question?

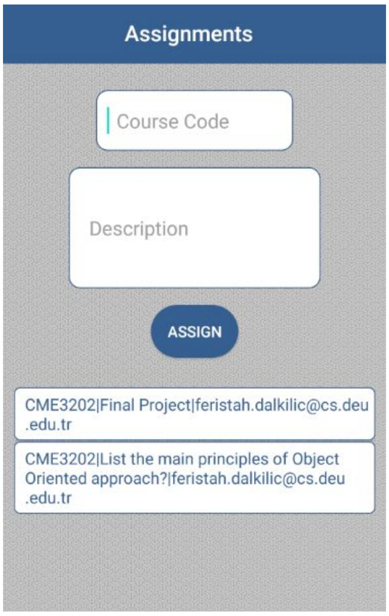
feristah.dalkilic@cs.deu.edu.tr
Next lecture's presentations are available.
Comments ...

feristah.dalkilic@cs.deu.edu.tr

In this page, It is shown everything that teacher posted. These are all posts which are posted by teacher as shown in left picture. It is enough to click on post to see the comments to that post and then pop-up screen opens. It can be commented or deleted all comments by the both types of users. Also, if the post is deleted by the teacher, all comments on it is deleted.

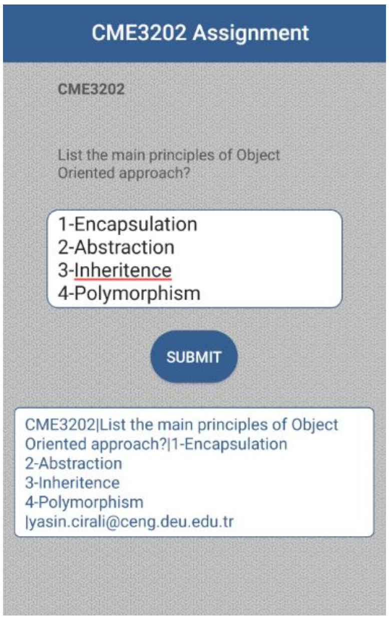
These comments is shown in right picture as an example.

-Assignments:



CME3202|Final Project|feristah.dalkilic@cs.deu.edu.tr

CME3202|List the main principles of Object Oriented approach?|feristah.dalkilic@cs.deu.edu.tr

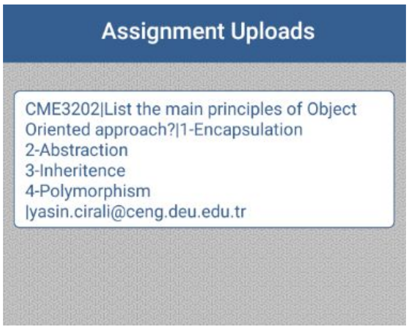


CME3202

List the main principles of Object Oriented approach?

1-Encapsulation
2-Abstraction
3-Inheritence
4-Polymorphism

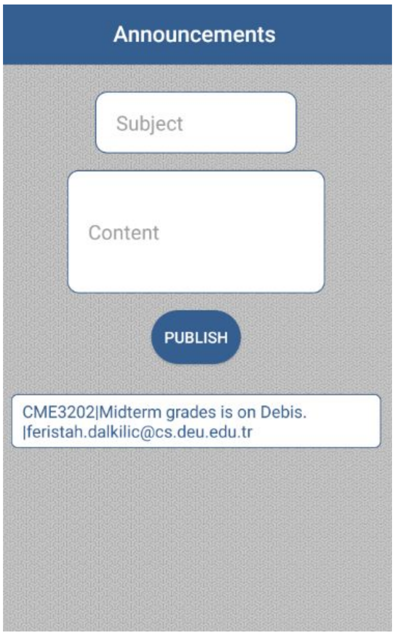
CME3202|List the main principles of Object Oriented approach?|1-Encapsulation
2-Abstraction
3-Inheritence
4-Polymorphism
|yasin.cirali@ceng.deu.edu.tr



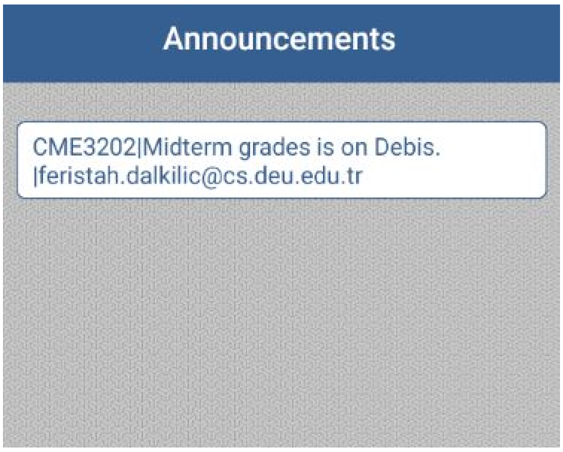
CME3202|List the main principles of Object Oriented approach?|1-Encapsulation
2-Abstraction
3-Inheritence
4-Polymorphism
|yasin.cirali@ceng.deu.edu.tr

Assignment is created by entering course code and explanation about assignment by the teacher as shown in left picture. If a course code which is not exist is written into course code part, assignment will not be added or if it is tried to add an assignment of any course by a teacher and this course is not belong to the that teacher, it will be not added neither. The second picture is student page. It can be replied assignments by the students. After submitted, it can be deleted if desired by clicking on it long. Assignment uploads can be displayed if any assignment which is in list of assignments are clicked by the teacher and the right picture is an example of this.

-Announcements:



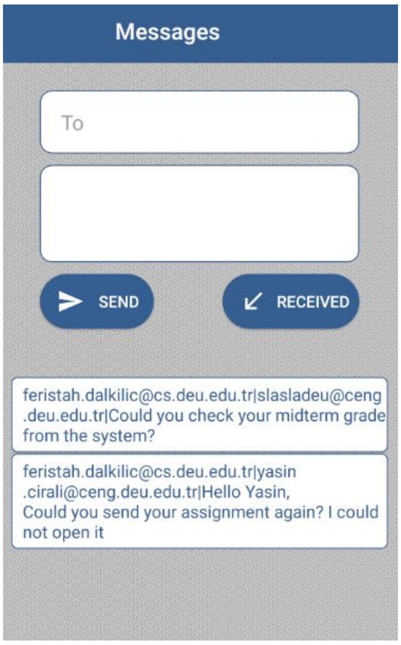
CME3202|Midterm grades is on Debis.
|feristah.dalkilic@cs.deu.edu.tr



CME3202|Midterm grades is on Debis.
|feristah.dalkilic@cs.deu.edu.tr

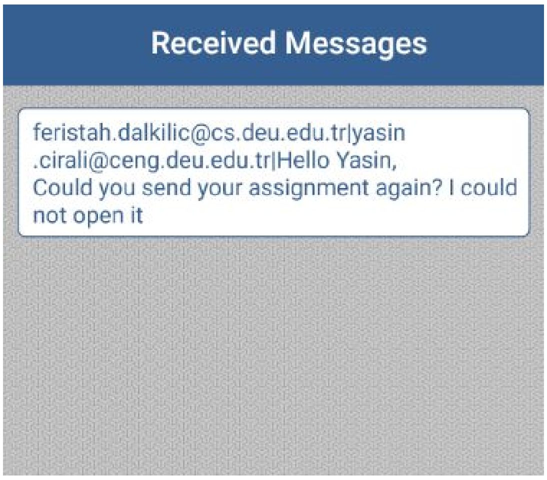
First picture is the page which is made an announcement by teacher. Announcement can be deleted by clicking long on it if it is desired. it is not necessary that subject is a course code. The picture on the right is an example of how assignments page of students looks.

-Messages:



feristah.dalkilic@cs.deu.edu.tr|slasladeu@ceng.deu.edu.tr|Could you check your midterm grade from the system?

feristah.dalkilic@cs.deu.edu.tr|yasin.cirali@ceng.deu.edu.tr|Hello Yasin,
Could you send your assignment again? I could not open it



feristah.dalkilic@cs.deu.edu.tr|yasin.cirali@ceng.deu.edu.tr|Hello Yasin,
Could you send your assignment again? I could not open it

The picture on the left is a message page that belongs to feristah.dalkilic.cs.deu.edu.tr and every messages which are sent by Feriştah Dalkılıç are listed below. And the sent message is displayed as shown in picture on the right in the received messages section of the account “yasin.cirali@ceng.deu.edu.tr”.

12)Contribution of each group member

Predominantly;Course,Stream and Announcement sections are Yasin, Assignment and UI interface sections are Zehra, Login and Messaging sections are SILA did. Report and Presentation titles were divided equally.

13)Additional Improvements

When you click "Comments" to see the comments of the posted posts, the comments open as a Pop-Up screen. Students can delete their registration from the course they enrolled in. Those who comment on the Post can delete their comments by long click. There is another improvement on the database, in the course stream page the teacher can delete any post what she wants, but the program should delete also the comments under those posts in the stream, we provide this to manage the storage efficiently.

14)Incomplete tasks: reasons, explanations

We were expected to use associative arrays structures in our project but we could not find the exact associative array usage in JAVA but we could do the same work with map structure(hash map).

15)Problem Encountered

The first problem we encountered is that when we add a new table to the database we could not see the table and the program gave us a runtime error. But then we discovered to delete the app from the emulator then install it again. It solved the problem.

And second one is that we tried to add the back button to the top of the actionbar but program crashed then we could not solve it and the back button is removed.

The project is finished with all the functionalities and capabilities. But after checking the requirements, we were able to realize some of the requirements can be not as exactly what the project requires. All the requirements are used at least one time in the project but some of them may not satisfy your requirement for example inheritance is used actively in every activity but you may ask an example for the inheritance that we created main and superclass by hand. Most of them are a part of the project by using some ready classes, ADT, and libraries. As a group, we think that our project is working well and meets all the functionality requirements, and despite Android Studio was a new platform for us we made so much effort and did well. While you are evaluating, we hope that you will tolerate some little issues.

16)Conclusion

We did not have any deficiencies affecting the project and we meet the requirements and completed the project. The project works functionally as desired. We do not have a functional deficiency. Teachers and students can do what they need to do. Our data can be stored in tables in SQLite structure without being lost and also we tried to use the database efficiently as we mentioned in additional improvements. Thanks to this project, we got to know the Android Studio IDE and gained experience in Android App development.

17)References

https://guides.codepath.com/android/endless-scrolling-with-adapterviews-and-recyclerview

https://android.jlelse.eu/passing-data-between-activities-using-intent-in-android-85cb097f3016

https://developer.android.com/studio/known-issues