Concordia University
COEN/ELEC 390
Winter 2019
Technical Assignment 1

Deadline:	Tuesday January 22nd, 2019
Late Submission:	-20% for every 1 day late after due date

Objective: Design and implement an android mobile application to view a list of courses with their assignments and grades. By the end of the assignments we will end up with a simple grades management application where students can store assignment grades for the courses they are taking and be able to view the courses with their grades.

Application Description

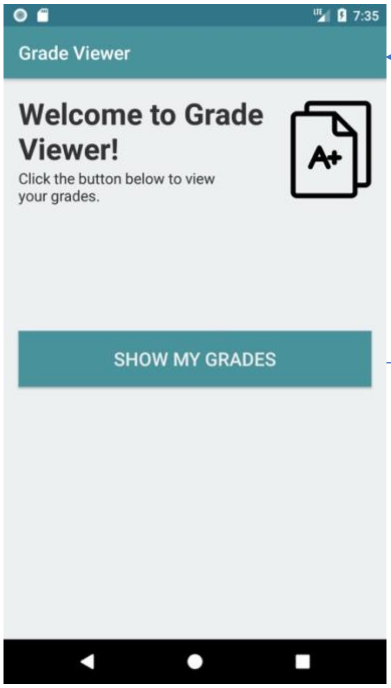
- Two Activities: mainActivity and gradeActivity.
  - gradeActivity is a child Activity to mainActivity.
- mainActivity has:
  - A button labeled "View My Grades" that takes you to the gradeActivity.
- When gradeActivity is created:
  - Generate random number (1 to 5) of Course instances (Course class explained below).
  - Display the Courses with their Assignments in a ListView.
  - Calculate the Average of the grades per Course, assuming all grades are out of 100.
- The Action Bar of the grade Activity must have:
  - Back arrow on the left to provide an Up Navigation to mainActivity when pressed.
  - An Action on the right, when pressed the grades displayed will switch from number grades to letter grades (and vice versa).

Things to help you with the assignment

It might take some time depending on your programming skills but if you **read the tutorials** provided below and **go through the examples** they have then the assignment will basically be applying everything together in one application.

- Providing up navigation (activities hierarchy)
  https://developer.android.com/training/implementing-navigation/ancestral.html
- Android List View
  https://developer.android.com/guide/topics/ui/layout/listview.html
  https://www.tutorialspoint.com/android/android_list_view.htm
- Adding an action to the Action Bar
  https://developer.android.com/training/appbar/actions.html

Sketches of what your App can look like at the end



7:35

Grade Viewer

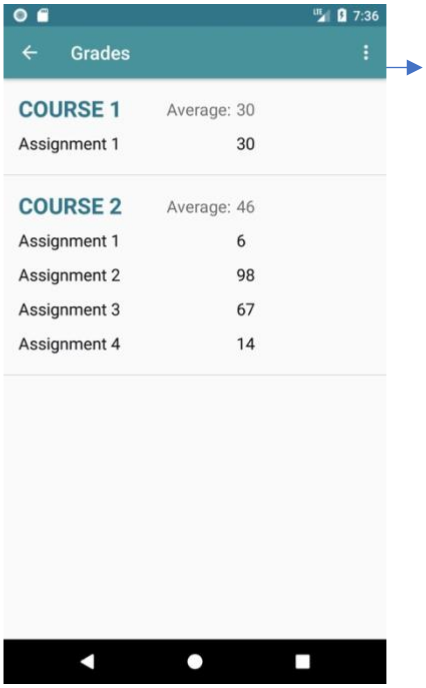
Welcome to Grade Viewer!

Click the button below to view your grades.

SHOW MY GRADES

When arrow is pressed: Go back to main Activity

When button is pressed: Go to Grades Activity



7:36

Grades

COURSE 1 Average: 30
Assignment 1 30

COURSE 2 Average: 46
Assignment 1 6
Assignment 2 98
Assignment 3 67
Assignment 4 14

When pressed, an action will show: when the action is pressed grades will change from number to letter grades and vice versa.

This can also be one Action instead of a menu option with one item in it.

Video Demo of the assignment: https://youtu.be/zRIG5MCWXCM

Generating random courses with random assignments and grades

The following two Java Classes will allow you to generate a Course with auto generated Title and auto generated random number of assignments (max 4) with a random grade out of 100.

A sample code below will show you how to use the Course class to generate the courses that you will be displaying. Every time the user navigates to the Grades Activity a different set of Courses will be randomly generated and displayed in a List View manner.

Assignment.Java

```
import java.util.Random;

/**
 * Created by Tawfiq on 1/13/2017.
 */
public class Assignment {

    private static int assID = 0;        //static ID increments with every new
assignment created
    private String assignmentTitle;             //title of assignment
    private int assignmentGrade;                //grade of assignment

    //private constructor. Increments ID.
    private Assignment(String title, int grade)
    {
        assignmentTitle = title;
        assignmentGrade = grade;
        assID++;
    }

    //returns an Assignment instance with random values
    static public Assignment generateRandomAssignment()
    {
        Random rnd = new Random();
        String tempTitle = "Assignment " + assID;
        int tempGrade = rnd.nextInt(100) + 1;

        return new Assignment(tempTitle, tempGrade);
    }

    //****get methods*****//
    public String getAssignmentTitle()   {return assignmentTitle; }
    public int getAssignmentGrade()   {return assignmentGrade;}
}
```

Course.Java

```
import java.util.ArrayList;
import java.util.Random;

/**
 * Created by Tawfiq on 1/13/2017.
 */
public class Course {
    private static int courseID = 0;             //static ID increments with every new
Course created
    private String courseTitle;                  //cou
    private ArrayList<Assignment> assignments;

    private Course(String title, ArrayList<Assignment> assns)
    {
        courseTitle = title;
        assignments = assns;
        courseID++;
    }

    //returns a Course instant with random assignment values
    static public Course generateRandomCourse()
    {
        Random rnd = new Random();
        int assignmentNo = rnd.nextInt(5);
        ArrayList<Assignment> tempAssns = new ArrayList<Assignment>();

        for(int i=0; i < assignmentNo; i++)
            tempAssns.add(Assignment.generateRandomAssignment());

        return new Course("Course " + courseID, tempAssns);
    }

    //****get methods*****//
    public String getCourseTitle()  {return courseTitle;}
    public ArrayList<Assignment> getAssignments()   {return assignments;}
}
```

Both classes are important to be created inside your Android project.

The following is a sample code main function that you can test the two classes in a console App:

```
public class Driver {

    public static void main(String[] a)
    {
        for(int j=0; j<5; j++) {
            Course course = Course.generateRandomCourse();
            ArrayList<Assignment> assignments = course.getAssignments();
            System.out.println(course.getCourseTitle());
            for (int i = 0; i < assignments.size(); i++) {
                System.out.println(assignments.get(i).getAssignmentTitle()
                        + "    " + assignments.get(i).getAssignmentGrade());
            }
        }

    }
}
```

The output of this main is:

```
Course 0
Assignment 0    3
Course 1
Assignment 1    60
Assignment 2    36
Course 2
Assignment 3    37
Assignment 4    51
Assignment 5    46
Course 3
Course 4
Assignment 6    83
Assignment 7    24
Assignment 8    58
```

Your grades activity will have a member:

```
ArrayList<Course> courses;
```

When the activity is first created you will generate a random number of courses. The above example generates 5 courses at all time. Then you will display the courses in a ListView.

Assignment submission and procedure

You have to submit your assignment before midnight on the due date using moodle Assignment Submission. The file submitted must be a **.zip** file named **StudentID_Ass1** containing your android project. **Before submitting your code make sure you clean the project.**

```
Android Studio --> Build --> Clean
```

Evaluation criteria and grading scheme

Meeting the requirements and use cases	80%
Clean code: well commented, proper naming, easy to read and understand.	15%
User Interface: neat and creative ;)	5%

If the project submitted does not compile and run the student will receive a grade of 0! So, make sure even if the assignment is not completely done that you submit an application that can be built and run. We will not grade none compiling code.