



Department of Computer Science  
COMP2421 (Fall2021/2022)

**Project #1**

Due date 20/10/2021 @ 11:59PM

Department of computer science at Birzeit University offers a set of courses each semester. These courses are listed in a file as follows: course name, course id, year (120, 121 ...), and max number of students.

The course id must start with COMP. The year refers to the student's registration year (e.g., 115 means that the students who registered in this the year 2015 or before are allowed to register this course, while the 116 are not allowed). The file that contains the courses' information is formatted as follows:

Java,COMP231,120,30

Data Structures Java,COMP242,119,30

Algorithms,COMP336,114,30

Introduction to programming,COMP133,116, 27

....

Students' information; name, id, courses to be registered (COMP242, COMP336, COMP231...) are listed in a file as follows:

Ahmad Ali#1189999# COMP242#COMP336#COMP231#COMP338

Khaled Mahmoud#1191123# COMP242#COMP336#COMP231

Amal Mohammad#1199999# COMP242#COMP336#COMP231

....

Please note that the first three digits (from left) of the student's ID represent the registration year.

**To Do:**

1. **Read** the offered courses from the courses file into a linked list, and then **read** the students (from the second file) into another linked list. After that, the students are to be **added** to these courses in an array of linked lists. Before adding any student to any course, you have to make sure that:
  - a. The course is offered by the department (i.e. is available in the list). The student may ask to register for a course (i.e., Security) while it is not offered on that semester!
  - b. The student is allowed to take that course (according to his registration year).
  - c. The student can register for at most 5 courses each semester.

- d. The student can not register in a closed course, e.g. number of registered students reach the maximum number. Alternatively, add this student to a waiting list for this course.
  - e. Show a relevant message in case the student can not register a course, e.g. closed course, course not offered, the student registered 5 courses, etc.
2. Your program should have all functionalities working properly.
  3. There has to be adequate documentation and comments in the code (i.e., functions, loops, etc.).
  4. Your code should follow the code convention (i.e., spaces, indentations, etc.); and
  5. Your program should contain a **menu** to allow the user to select which option (s) he would like to run (Choose any suitable menu that contains all functionalities).

## 6. Reports:

The department's chair needs the following reports by the end of the registration process (give the user the ability to print on a file).

- Print the students' list that contains all students' information (ordered based on student's ID) in each course in a table format (a table for each course).
- Print a course list (ordered based on course name) that contains, the course name, course id, number of registered students in that course, and number of students in the waiting list for that course.
- Print a list of all courses that have less than 5 students.
- Search for any course based on course ID, if found, print all students ids' and names' in this course.
- Search for any student based on student ID, in a given course.

## General notes on the project:

- All submissions should be through ITC Moodle.
- Late submissions are not accepted.