



BIRZEIT UNIVERSITY
Department of Computer Science
COMP242/2321 (Spring - 2016/2017)

Department of computer science at Birzeit University offers a set of courses each semester. Each course has the following information: course name, course id, year (115, 116 ...), start time, finish time, and max number of students.

The course id must start with COMP, the start and finish time are in 24 hours format. The year refers to the student's registration year (e.g., 115 means that the students who registered 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#115#13:00#13:50#30

Data Structures Java#COMP242#115#12:00#12:50#30

Algorithms#COMP336#114#13:00#13:50#30

Introduction to programming#COMP133#116#11:00#11:50#27

....

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

Ahmad Ali#1159999# COMP242#COMP336#COMP231#COMP338#...(add more courses ...)

Khaled Mahmoud#1169999# COMP242#COMP336#COMP231#....

Amal Mohammad#1139999# 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 file into an array, then the students (from the second file) are to be added to these courses in a linked list (array of linked lists). Before adding a student to any course, you have to make sure that:
 - a. The course is offered by the department (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. There is no time conflict in the student's schedule (he cannot register two courses at 13:00!).
 - d. The student can register for at most 5 course each semester.
2. The students should be added to the courses in ascending ordered based on the name field.

Reports:

The department's chair needs the following reports by the end of the registration process (to be printed in a file):

- 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). Use the **Radix Sort**.
- A list of all students in all courses (ordered based on student's name).
- The schedule of a specific student in that semester (in a suitable format).
- A course list that contains, the course name, id and number of registered students in that course (ordered based on the year).

Grading policy and general notes on the project:

1. Your application should have all functionalities working properly. Twenty marks will be graded for the functionality of the project.
2. The following notes will make up the remaining 10 marks of the grade:
 - a. There has to be adequate documentation and comments in the code (i.e., functions, loops, etc.).
 - b. Your code should follow the code convention (i.e., spaces, indentations, etc.); and
 - c. Your application 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).