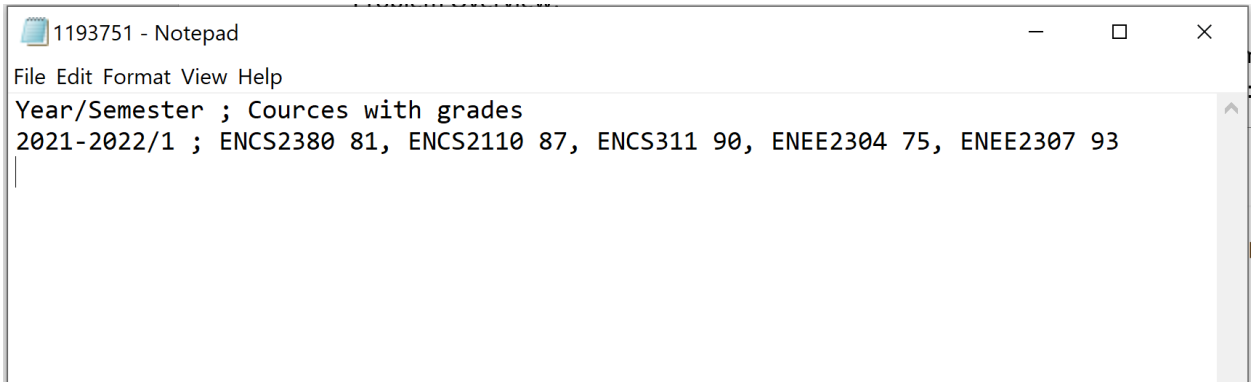
Birzeit University
Department of Electrical & Computer Engineering
First Semester, 2021/2022 ENCS313
Linux Laboratory
Python Project – Students Records Management System

Problem Overview:

In this project, the system will provide operations related to students record system like add a new student record, update, search…. Each student record must be saved in text file. The structure of the file must be as shown below:



Where:

- Year/semester represent the academic year and the current semester. For example: 2021-2022 represent the academic year, 1 represents first semester (2 for second semester, 3 for summer semester)
- Courses with grades: lists of course taken in the academic year/semester.

Each student must have separated file and the name of the file will be the student ID.

Scenario:

- First the user must login to the system. Here there are two types of users: student and admin
- Then, the program will print the available list of options which is based on the user type
- The option available includes the following:
    - **Admin options:**
        1. Add a new record file: here the program must ask to enter student ID. The program must raise an error if the ID is not unique.

2. Add new semester with student course and grades: here the program must ask to enter the required information (student ID, year/semester, courses and grades). The system must raise an error if there is missing information or the information in wrong format.
3. Update: here the system must ask for student ID and the name of the course to be change and the new grade.
4. Student statistics: first the program must ask for student ID. The program will print information such as number of taken hours, remaining courses (you need to create a list/file that contains all ENCS and ENEE courses for computer engineering program), average per semester, overall average
5. Global statistics: here the program must print information regarding all student such as overall students average, average hours per semester, plot the distribution of their grades (histogram).
6. Searching: here the system must retrieve the ID of the students that satisfy the given criteria. Here you can search for the following: based on average, taken hours. For example: retrieve the IDs that have an average grater/less/equal than 70.

- **Students' options:**
    1. Student statistics: here the program must print information such as number of taken hours, remaining courses, average per semester, overall average.
    2. Global statistics: here the program must print information regarding all student such as overall average, average hours per semester, plot the distribution of their grades

Submissions:

- You need to submit the code in .py format. If you made different files, you need to create a module and import them.
- Provide screenshots for #5 results.
- Provide descriptions of the used data structures with clarifications (Why did you use it here?).

Important notes:

- Write the code for the Python program to satisfy the requirements described above.
- You must use functions (at least one function for each option).
- You must use OOP concepts (classes, inheritance …)
- Make sure your code is clean and well indented; variables have meaningful names, etc.
- Make sure your script has enough comments inserted to add clarity.