An-Najah Nation University
Faculty of Engineering

جامعة النجاح الوطنية
كلية الهندسة

Computer Engineering Department
Data Structures and Algorithms (10636211)

HW 2

ILOs [3]	Due to 24/11/2021	10 points

In this assignment, you will implement a linked list to maintain and register students in a university (small scale). The information required for the students as, the NAME, STU_ID, ADDRESS, AGE, MAJOR and LEVEL. By using this STU_ID number, we will be able to retrieve and update information for the students. The STU_ID must be unique.
Initially the levels are not constructed yet, they depend on the file(s) information. For each new Level from the file, you will make new starting node. All students with the same level must be added to the same Level head node. The students must be added in ascending order (STU_ID) for their level. Changing the level of a students, results in removing the record from that level and added it in the correct place in the new level.

You can use the following definitions:

```
struct STUDENT {
        char name[64];
        char address[64];
        char major[64];
        int id;
        int age;
        int level;
        STUDENT* next_student;
};
```

```
struct LEVELs {
        int id;
        int level;
        STUDENT* head_student;
        LEVELs* next_level;
};
```

We can use the following commands:

- **ImportFile:** ImportFile input1.txt // read all data from file input1.txt
- **SaveFile: SaveFile** output1.txt// save all data to file output1.txt
- **printAll:** print all students information in separate lines.
- **ListLevels:** Display all available levels.
- **List_in_level:** List_in_level 3 // list all students in level 3

Commands using the STU_ID

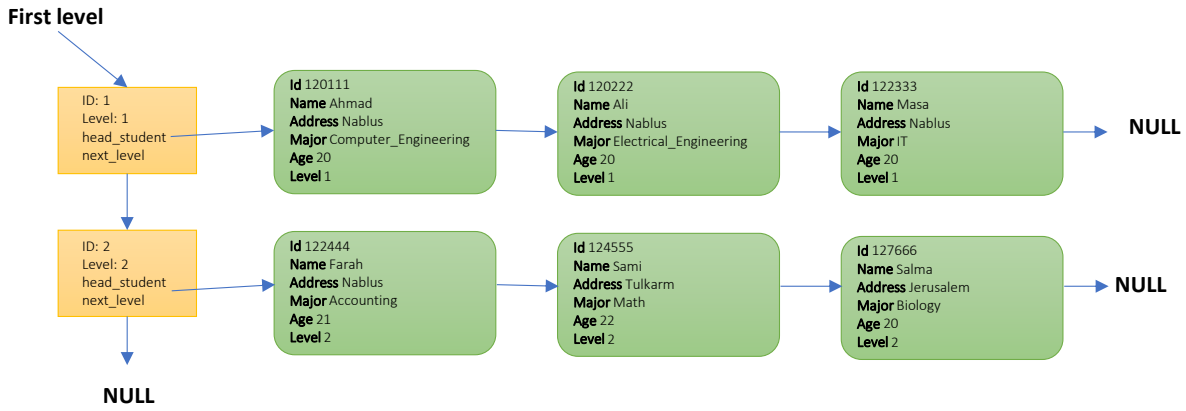
- **Add:** Add 120123 // add new students with Id 120123
- **Set_name** : Set_name *120123* Ali
- **Set_address:** Set_address *120123* Nablus_WestBank
- **Set_major:** Set_major *120123* Computer_Engineering
- **Set_age:** Set_major *120123* 20
- **Set_level:** Set_major *120123* 3 // here you must add the students to level 3 linkedlist.
- **Delete:** Delete *120123* // delete the student node from the linkedlist correctly.
- **Exit:** Exit from program. Save data in backup.txt

Input File: *"input1.txt"*

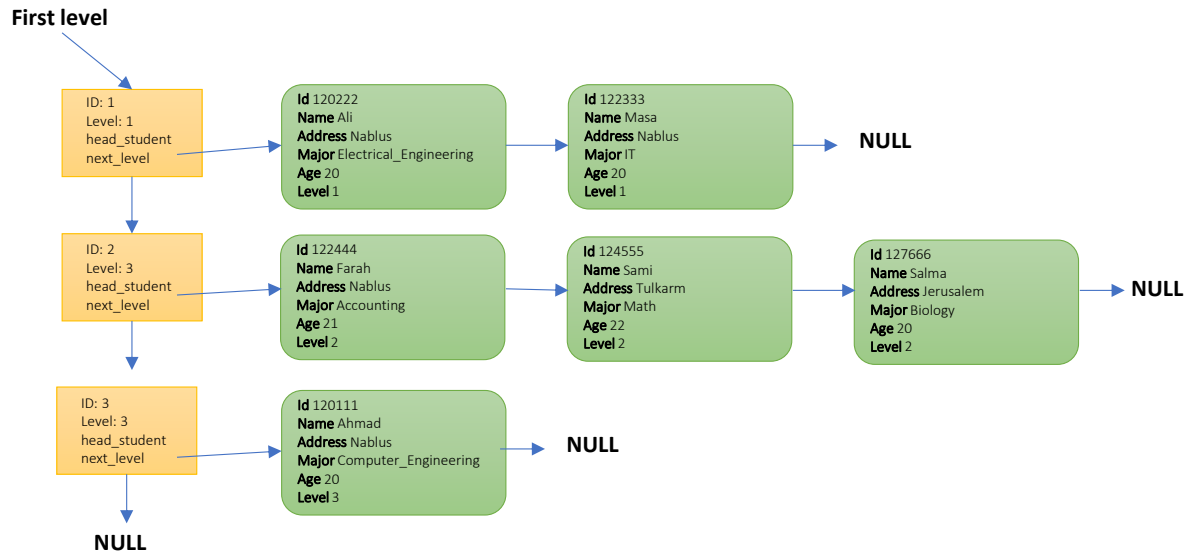
```
// ID name address major age level

120111 Ahmad Nablus Computer_Engineering 20 1
120222 Ali Nablus Electrical_Engineering 20 1
122333 Masa Nablus IT 20 1
122444 Farah Nablus Accounting 21 2
124555 Sami Tulkarm Math 22 2
127666 Salma Jerusalem Biology 20 2
```

The result of the linked list, after command
ImportFile input1.txt



The result of the linked list, after command
Set_level 120111 3



The result of:

ListLevels
1 2 3

List_in_level 1
120222 Ali Nablus Electrical_Engineering 20 1
122333 Masa Nablus IT 20 1

Display an error message if the command is not known, or the ID no match.

You must create function for reading the command from the screen in infinite loop, then it calls the corresponding function. After each command, you must show if they command is executed correctly with message OK, else error. Then you read another command.

There are 13 commands. The homework depends on reading the commands from the screen. You should be able to deal with strings well. In addition, call the suitable function depending on the command.