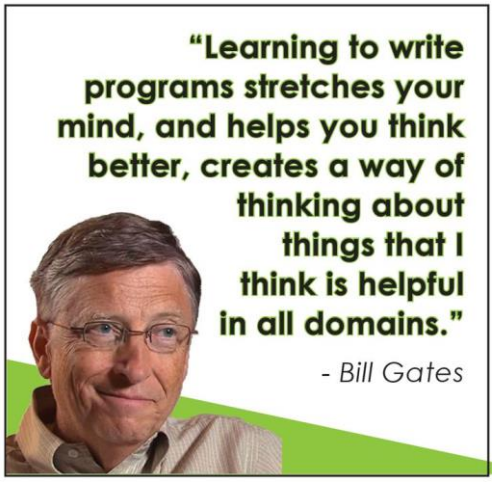

Al Akhawayn University in Ifrane

School of Science and Engineering

CSC2302 Project 3

Fall2022

By: Hanaa Talei

This is your last CSC2302 project that counts 5% of your overall grade

☛ You need to submit your project **Wednesday December 14th** before midnight

- 1 group member will have to send .c file as an email attachment.
- Name your file as follow: StudentName1_StudentName2_Project3.c
- Email to use: H.Talei@aui.ma
- You need to CC your project partner
- An email received Thursday December 15th starting 00:00 will not be accepted: **You get a zero**

☛ Assume the responsibility for the work you will submit

- Any form of plagiarism will imply a WF as course grade

☛ The main goal of this project is to test your understanding of heaps

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Housing is an AUI issue:

Many students prefer to live on campus but currently AUI cannot afford to have all the students on campus given the current high number of students. Still, some considerations are made to have some students live on campus if rooms are available. We consider the following considerations:

1. First year student (15 points priority)
2. Student has health issues (10 points priority)
3. Others (5 points priority)

To work on a small scale, we will work with a heap of size 20.

We will use a structure called **student_info** that consists of three elements: name, ID and priority (a numerical variable).

I am providing you with a file called OnCampusRequests.txt that contains data about students who requested to live on campus for Spring2023.

You need to write a C program used to manage the requests to live on campus using the following menu:

1. Start the program
2. Add a request
3. Grant a student a room on campus
4. View requests in a sorted way
5. Cancel a request
6. Quit

Please note that each menu option should be implemented using a user defined function.

Let's elaborate each menu option:

- **Option 1**: When the user chooses option1, your program should load the content of the file to the heap.
    - A max heap should be constructed
    - Make sure that each element of the heap has the corresponding priority
- **Option 2:** this option is used to add a new student to the list of students requesting living on campus
    - Option 2 should not be executed if the user did not choose option 1 first
    - The heap might be full

        - Main function should print a message informing the user than no more requests can be added!
- **Option 3:** In this option, you need to send to the main function data about the student who was granted a place to live on-campus.
    - The output in the main should be in the following format: **Student…….. with ID:…… was assigned a room on campus because: …….(state the reason)……..**
    - Option 3 should not be executed if the user did not choose option 1 first
- **Option 4** is used by the housing manager to view students' requests sorted using the priority
    - From the highest to lowest
    - Use heapsort
    - Data about students should be display in a tabular format as follows:

      Student ID Student Name Reason

      …….. ……. ……

      …….. ……. ……

      …….. ……. ……

      Etc….

    - Option 4 should not be executed if the user did not choose option 1 first
- **Option 5**: This option is meant to drop a student request to live on campus.
    - Option 5 should not be executed if the user did not choose option 1 first
    - Student may or might not exists
    - When the student is dropped, main should display a message in the following:

Student ……with ID: ….. who applied for living on campus for reason……., was deleted from the heap.

- **Option 6:** For the last option, quit, any student left in the heap should be saved in a file called ToContact.txt:
    - The file should contact only the students email addresses as the housing director needs to contact students by email to inform them that no on-campus housing will be provided for next Spring.
        - Email adopted here in AUI is studentID@aui.ma
    - Option 6 should not be executed if the user did not choose option 1 first

- In addition to the functions stated in this project description, you can add more functions as needed.
- Make sure that you avoid getting input or printing results in functions
- No global variables should be used in this project

Good Luck!