National Institute of Technology Calicut
Department of Computer Science and Engineering
Third Semester B. Tech.(CSE)
CS2092D Programming Laboratory
Assignment #6 Modification (9/10/2023)

Naming Conventions

- The source codes must be named as

`ASSG<NUMBER>MOD_<ROLLNO>_<FIRST-NAME>.c`

(For example: $ASSG6MOD\_BxxyyyyCS\_LAXMAN.c$).

Standard of Conduct

- Violation of academic integrity will be severely penalized. Each student is expected to adhere to high standards of ethical conduct, especially those related to cheating and plagiarism. Any submitted work MUST BE an individual effort. Any academic dishonesty will result in zero marks in the corresponding exam or evaluation and will be reported to the department council for record keeping and for permission to assign F grade in the course. The department policy on academic integrity can be found at: http://cse.nitc.ac.in/sites/default/files/Academic-Integrity_new.pdf.

General Instructions

- Programs should be written in C language.
- Check your programs with sufficiently large values of inputs with in the range as specified in the question.
- Global and/or static variables should not be used in your program.

QUESTIONS

1. Design a menu-driven program for a Flight Booking System where passengers can reserve flight tickets. Each passenger can request to book a ticket and is assigned a priority value p. The flight ticket issuance is based on the passenger priority in the booking queue, Que. A lower priority value implies a higher booking priority (similar to ranking). We assume that the u_{name} (user name of the passenger) is unique. Design and implement this program using a priority queue.

   Your program should be implemented using the following functions:

   - MAIN(): Repeatedly reads an input character from the menu list through the terminal and executes menu-driven operations accordingly. The list of menu options are ['a', 'b', 'd', 'f', 'u', 's'].
   - ADDPASSENGER(Que,u_{name},p): This function is used to add new passengers to the booking queue, Que.
   - FINDPRIORITY(Que): This function is used to retrieve the highest-priority passenger from the booking queue without removing it (print -1 if the queue is empty).
   - BOOKTICKET(Que): This function issues a flight ticket for a passenger with the highest priority and removes the passenger from the booking queue. (**Note**: If there is more than one person with similar priority, the person who is first in the queue will be considered first; print -1 if the queue is empty).
   - UPDATEPRIORITY(Que,u_{name},np): This function updates the priority of the passenger u_{name} to new priority, np.(**Note**: If the queue is empty, print -1; else, if u_{name} is not found in the booking queue, print 'N'. Also, both uppercase and lowercase letters are treated as different).

- displayReq(Que): This function is used to display all the booking requests of the passengers along with their priorities in the booking queue (print -1 if the queue is empty).

Input Format:

- Your input can contain two parts separated by space; the first part is the input character from the menu list. The second part feeds the parameters according to the menu option. Which can have at most two parameter values (either nothing or two).
- Each line of your input contains a character from the following menu list ['a', 'b', 'd', 'f', 'u', 's'] followed by at most two parameters depending on the menu function.
- Input 'a' should be followed by a string (which can be a combination of alphabets a-z or A-Z) for passenger name and an integer (belonging to [1,100]) for priority that is separated by a space.
- Input 'b' is to issue a ticket for the passenger with the highest priority and remove the entry from the booking queue.
- Input 'd' displays all the booking requests of the passengers along with their priorities in the booking queue.
- Input 'f' is used to find the highest priority passenger from the booking queue without removing the entry.
- Input 'u' is used to update the priority of the passenger with the user name u_{name} to np. So, it is followed by a string and integer value, separated by space.
- Input 's' stops the execution of the program.

Output Format:

- Line can contain a string representing the passenger name and an integer representing the booking priority, respectively.
- Line could also contain the character 'N' and an integer '-1' depending upon input.

Sample Input :

```
b
a Arya 4
a Neerav 5
b
f
a Zayan 1
a Amira 1
b
a Aleena 5
d
u Abu 2
u neerav 6
u Neerav 6
d
b
b
b
b
u Nayana 10
d
s
```

Sample Output :

-1
Arya 4
Neerav 5
Zayan 1
Amira 1
Neerav 5
Aleena 5
N
N
Amira 1
Aleena 5
Neerav 6
Amira 1
Aleena 5
Neerav 6
-1
-1
-1