Data Structure Assignment [2]

Programming homework

Queueing in campus cafeteria

There is a campus cafeteria which offers regular and vegetarian food. When a customer enters the cafeteria, he/she has to pick up a plate and get in line to order food. Each plate was indexed by a random number. Cafeteria staff refill the plate stack from time to time.
There are two lines in the campus cafeteria, one for regular food and the other for vegetarian food. A customer can choose a line, as he/she prefers and joins at the end of it. After finishing ordering, he/she will leave the line from the front to check out.
In this assignment, please write a program with the data structure stack to stimulate the plate stack and the data structure queue to stimulate the lines.

Input:
A file containing several rows of the following operations:
PUSH N indicates the staff refills a plate index N into the plate stack.
POP indicates the customer takes a plate from the top of the plate stake.
ENQUEUE X indicates a customer joins the end of the line X.
DEQUEUE X indicates a customer at the front of the line X leaves the line to checkout.
Input stops when EOF (ctrl+z on windows) is read.

Output:
Print out the plate index of the customer who left after each DEQUEUE operation in separate lines.

(optional)Note: Please write your own implementation of stack and queue and its operations.

Input

PUSH 30
PUSH 98
PUSH 54
POP
ENQUEUE A
POP
ENQUEUE B
PUSH 1
PUSH 3
POP
ENQUEUE A
DEQUEUE A
DEQUEUE B
POP
ENQUEUE B
POP
ENQUEUE B
DEQUEUE A
DEQUEUE B
DEQUEUE B
^Z (EOF)

Output

```
54

98

3

1

30
```

General information:

- Deadline: 2020/10/08 12:00.
- Submit your programming assignment to Moodle system.
- Submitted file format: student-ID_Name.zip, e.g. F12345678_王曉明.zip
- Submitted directory structure:

```
| -- F12345678_王曉明
    | -- F12345678_王曉明.pdf
    | -- code
        | -- xxxxx.c
        | -- xxxxx.c
```

- Your submitted file must contain **Source Code** & **Readme file** (Program description)
- Late homework will not be accepted
- There is a “zero tolerance” for plagiarism. You will receive a score of zero if you get caught plagiarizing.

Course Provisions

1. Program execution environment : Windows、Linux
2. Programming language : C (standard: C11) (**Languages other than C are not accepted**)
3. Submitted programming homework must include **source code** in .c data type, and **readme document** in .pdf data type. You are required to address the **(1) result screenshot, (2) program architecture, (3) program functions and (4) how you design your program** in readme file. Do not just write the pseudo code or even just copy and paste your code!
4. **There is a "zero tolerance" for plagiarism. You will receive a score of zero if you get caught plagiarizing.**
5. Please submit your programing homework to moodle.
6. Late homework is not accepted.
7. Programming homework grade is divided into two parts: 80% for the code and 20% for the readme file. **Partial points will still be awarded if the output results of your program are partly correct**. The remaining grading standards are decided by the TAs.
8. **Please name the filename of your submitted compressed file (e.g. F12345678_王曉明.zip) after your student ID number. 20 points will be deducted otherwise.**

TA time of the course:

Mon. 15:00 - 17:00

Wed. 11:00 – 12:00

Lab location: CSIE Bldg. Room 65302

If you have any question, please make an appointment in advance.

You can also mail us about your questions.

TA e-mail: ta_@dblab.csie.ncku.edu.tw