HW3: Queue ADT

제출은 gitLab을 통해서 하며 **http://hconnect.hanyang.ac.kr/2017\_CSE2010\_수업번호/2017\_CSE2010\_수업번호\_학번.git 에 HW3라는 폴더를 만들어 진행.**

\* 프로그램 제출간 유의사항

- 소스코드에는 주석이 있어야 함.

- 주어진 구조체와 input.txt를 사용해야 함

**- 숙제의 소스코드 평가는 linux ubuntu 16.04.2 LTS 버전 gcc 5.4.0에서 함.**

\* 보고서 제출간 유의사항

- 작성한 소스 코드가 첨부되어야 하며, 실행결과가 첨부되어야 함.

- 분량은 제한이 없으나 1~2apge로 간략하게 설명.

- 보고서는 hw3\_학번.확장자(doc, docx, pdf)로 제출.

**제출시간: '17.4.5(23:59) 까지**

**\*지연제출**

- 24시간 이내는 해당 과제 50% 감점, 48시간 이내는 75% 감점.

- 지연제출자는 E-mail(casualab@hanyang.ac.kr)과 gitlab에 모두 제출.

- E-mail제목: "hw3\_학번\_자신의 수업 요일(수, 목)\_이름 " 형식으로 제출.

Implement Circular Queue ADT using an array. Your Circular Queue ADT has two main operations, Enqueue and Dequeue. In addition, you should implement more functions.

* **Enqueue** a new element at the end of the element in the queue. If your queue is full, just print an error message "Queue is full".
* **Dequeue** the node in the front. If your list does not have any element, just print an error message "Queue is empty".
* **Peek** print the first element (i.e., the same element in the return value of Dequeue()) in the queue. If your queue is empty, just print an error message "Queue is empty" .
* **is\_empty** check if your queue is empty.
* **is\_full** check if your queue is full at enqueue operation.

1. Input

Obtain a list of operations from the given input files, and execute the given operations in order. A detailed specification of the operations is provided below. Each line represents a single operation. Each operation and the necessary parameters are separated by a space. You may assume that the input values are any characters. Note that MAX\_QUEUE\_SIZE-1 is the number of maximum elements (from: front +1, to: rear) that can be stored in the queue. Initial value of front and rear indices are set to 0.

* **e x**: enqueue a new element “x” sequentially
* **d** : dequeue the first element in the queue
* **p** : print the peek element in the queue

An input file is shown below.

|  |
| --- |
| Input1:  Input2: |

2. Output

An output file is shown below

1. CircularQueue ADT

(1) Data Specification for the objects

typedef int element;

typedef struct {

element queue[MAX\_QUEUE\_SIZE ];

int front, rear;

} QueueType;

(2) Function specification

* void init(QueueType \*q);
* void error(char \*message);
* int is\_empty(QueueType \*q);
* int is\_full (QueueType \*q);
* void enqueue( QueueType \*q, element item );
* element dequeue(QueueType \*q);
* element peek(QueueType \*q);

4. Program description

* name : hw3\_학번.c
* input : a list of operations in a file (an input file name is given as a command line argument. See an example in “1. input” on the first page)
* output : the corresponding result in the standard output

Submit to the course gitlab website (http://hconnetion.hayang.ac.kr) your source code and a written report. Your report should include the description of your own implementation.