**CSCI 520.001**

**Programming Assignment #7**

Due: Oct. 23, 11:59pm, Drop Box for Week 7

1. Complete the following **circular** **array** **implementation** of FIFO QUEUE in C++ to add the following member function**:**

* + **void peekAll():** display all the elements in the queue. The elements stay in the queue after this operation.

**class QUEUE**

**{**

**private:**

**int \*q; int N, head, tail;**

**public:**

**QUEUE(int maxN)**

**{ q = new int[maxN+1];**

**N = maxN+1; head = N; tail = 0; }**

**int empty() const**

**{ return head % N == tail; }**

**void put(int item)**

**{ q[tail++] = item; tail = tail % N; }**

**int get()**

**{ head = head % N; return q[head++]; }**

**void peekAll()**

**{ /\* implement this part \*/**

**}**

**};**

1. Write a C++ program that creates a queue of up to 100 integers, and then it does the following on user’s input (**your program must check for conditions: e.g. no get when the queue is empty**):

P x: puts x into queue

G : outputs the element at the head of the queue, and removes this element from the queue

E : outputs “empty” if queue is empty; otherwise “not empty”

F : displays the entire content of the queue in first-in first-out order; no change in the queue

Example Dialogue (input can be read from a specific file, or can be directed to a file):

E <ENTER>

empty

P 1

P 10

E <ENTER>

not empty

F

1 10

P 19

G

1

G

10

E <ENTER>

not empty

P 5

P 20

F

19 5 20

G

19

G

5

G

20

E <ENTER>

empty

G

nothing to get; queue is empty

F

nothing to peek; queue is empty

P 2

E <ENTER>

not empty

F

2

In this assignment, both **correctness** and **efficiency** of your programs are important.