Data Structure Lab Program - 2016

Lab exercise – 4

Note: All programs must be written in C following coding rules as mentioned on the course website.

1. Implement a simple queue using array that performs following operations. Appropriate error messages such as 'overflow' and 'underflow' should be printed.
   a. enqueue(sq, value)
   b. dequeue(sq)
   c. size(sq)
   d. top(sq)
   e. front(sq)

2. Implement a circular queue using array that performs following operations. Appropriate error messages such as 'overflow' and 'underflow' should be printed.
   a. enqueue(sq, value)
   b. dequeue(sq)
   c. size(sq)
   d. top(sq)
   e. front(sq)

3. Implement two circular queues as mentioned in Q2 using a single array.

4. Implement a queue using two stacks.

5. Implement a circular queue using the following structure in such a way that index of the rear element is computed automatically:

```
struct queue {
        size_t size;
        int front;
        int data[100];
};
```

6. Implement a double-ended queue using array that performs following operations. Such a queue can perform enqueue/dequeue operations at both ends. Appropriate error messages such as 'overflow' and 'underflow' should be printed.
   a. enqueue_rear(dq, value)
   b. enqueue_front(dq, value)
   c. dequeue_rear(dq)
   d. dequeue_front(dq)