

## CSE 143 Su01 Quiz 4 – August 9, 2001

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**1(a).** One of the data structures used frequently in programming is a Queue (implemented here with a linked list). Given the following data structure for a queue of integers, implement the **int remove()** method in the space below.

```
struct Node {
    int data;
    Node *next;
};

class Queue {
public:
    Queue();
    int remove();
    void insert(int item);
    ~Queue();
private:
    Node *front;
    Node *rear;
};

int Queue::remove() {

    assert(front != NULL);
    int returnValue = front->data;
    Node * temp = front;
    front = front->next;
    if (front == NULL)
        rear = NULL;
    delete temp;
    return returnValue;
}
```

**1(b).** What is the running time, in bigOh notation (e.g.  $O(n)$ ,  $O(1)$ ,  $O(n^2)$ , etc.) of this function?

**$O(1)$**

**2.** A Queue could also be implemented with an array instead of with a linked list. Give one advantage or one disadvantage of implementing a Queue with an array rather than using a linked list.

- an array is simpler because it avoids using pointers
- an array is less efficient because the remove method takes  $O(n)$  time
- etc.