First Name Last Name

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Review: QUEUES

1. Queues play a major role in:

A. postfix calculation.
B. infix to postfix conversion.
C. simulation of traffic conditions.
D. balanced parentheses checking.
E. None of the above.

2. A typical queue application is in operating systems:

(A) Categorizing data. (B) Operating systems often maintain a queue of processes that are ready to execute or that are waiting for a particular event to occur. (C) Computer systems must often provide a "holding area" for messages between two processes, two programs, or even two systems. This holding area is usually called a "buffer" and is often implemented as a queue.

Another typical queue application is in (fill in the blanks then explain) _____

3. Stack and Queue Algorithms: What would be the contents of **stack** and **que** after the following algorithm is executed? Input sequence: `10, 20`

```
k = 0
loop( k < 2 )
   read(data)
   stack.push(data)
   stack.push(data)
   que.enqueue(data)
   k = k + 1
end loop
```

4. Stack and Queue Algorithms: What would be the contents of **stack** and **que** after the following algorithm is executed? Input sequence: `10, 20`

```
k = 0
loop( k < 2 )
   allocate( data and store its address in dataPtr )
   read( data using dataPtr)
   stack.push(dataPtr)
   stack.push(dataPtr)
   que.enqueue(dataPtr)
   k = k + 1
end loop
```

Review: QUEUES

5.

(A) What is the Big O notation of the **`catQueue`** algorithm given below?

```
Algorithm catQueue( q1, q2 )
      This algorithm appends q2 at the end of q1
      Pre: q1, q2
      Post: q1 –  contains at the end the elements of q2
            q2 – empty

      loop( !q2.isEmpty(q2) )
         q2.dequeue(data)
         q1.enqueue(data)
      end loop
end catQueue
```

(B) Rewrite the catQueue algorithm as a new algorithm (code oriented pseudocode or C++ function). Its efficiency should be constant.