

## Queue Problems:

1. What would be the value of queues Q1 and Q2, and Stack S after the following statements are executed?

```
S = createStack(); Q1 = createQueue(); Q2 = createQueue();
```

```
enqueue(Q1, 5);
```

```
enqueue(Q1, 6);
```

```
enqueue(Q1, 9);
```

```
enqueue(Q1, 0);
```

```
enqueue(Q1, 7);
```

```
enqueue(Q1, 5);
```

```
enqueue(Q1, 0);
```

```
enqueue(Q1, 2);
```

```
enqueue(Q1, 6);
```

```
loop (not emptyQueue (Q1) )
```

```
    dequeue(Q1, x);
```

```
    if (x == 0)
```

```
        z = 0;
```

```
        loop (not emptyStack(S) )
```

```
            popStack(S,y);
```

```
            z = z + y;
```

```
        end loop;
```

```
        enqueue(Q2, z);
```

```
    else
```

```
        pushStack(S, x);
```

end if

2. What would be the contents of queue Q after the following code is executed and the following data are entered?

Q = createQueue();

loop (not end of file)

    read number;

    If (number not 0)

        enqueue(Q, number);

    Else

        x = queueRear(Q);

        enqueue(Q,x);

    end if

end loop

Data are: 5, 7, 12, 4, 0, 4, 6, 8, 67, 34, 23, 5, 0, 44, 33, 22, 6, 0.

```
3. Q1 = createQueue(); Q2 = createQueue();
   loop (not end of file)
       read number
       enqueue(Q1, number);
       enqueue(Q2, number);
       loop (not empty Q1)
           dequeue(Q1, x);
           dequeue(Q2, x);
       end loop
   end loop
Data are: 5, 7, 12, 4, 0, 4, 6.
```

```
4. Q1 = createQueue(); S1 = createStack();
   loop (not end of file)
       read number
       if (number not 0)
           pushStack(S1, number);
       else
           popStack(S1, x);
           popStack(S1, x);
           loop (not empty S1)
               popStack(S1, x);
               enqueue(Q1, x);
           end loop
       end if
   end loop
```

end loop

Data are: 5, 7, 12, 4, 0, 4, 6, 8, 67, 34, 23, 5, 0, 44, 33, 22, 6, 0.

5. Imaging the contents of Q1 and Q2 are shown:

Q1: 42 30 41 31 19 20 25 14 10 11 12 15

Q2: 4 5 4 10 13

Q3 = createQueue();

count = 0;

loop (not empty Q1 and not empty Q2)

count = count + 1;

dequeue(Q1, x);

dequeue(Q2, y);

if (y equal count)

enqueue(Q3, x)

end if

end loop

Simple Applications:

1. Using Queue ADT, write procedure copyQueue() to copy contents from one queue to another.

2. Using Queue ADT, write procedure catQueue() that concatenates two queue contents.

3. Implement Stack using Queue.

4. Implement Queue using Stack.