Algorithms and Data Structures for Data Science
lab_quacks

CS 277

Brad Solomon

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UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

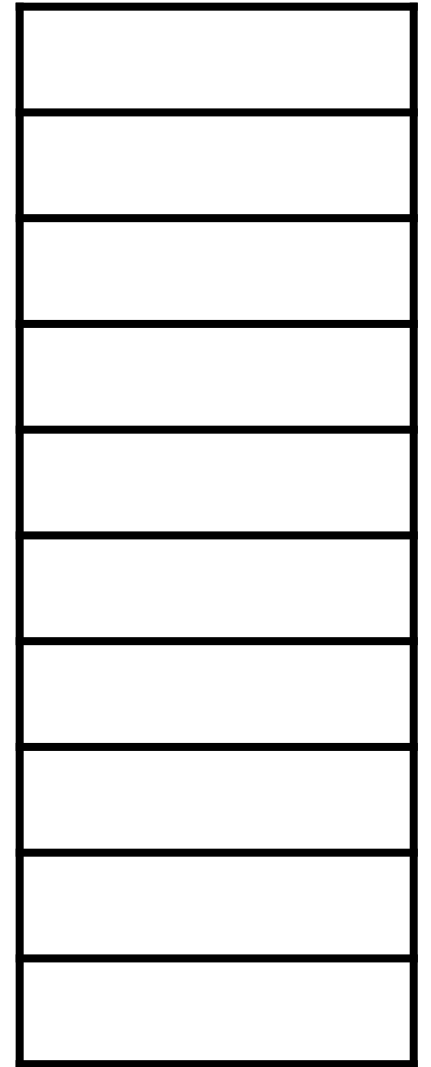Department of Computer Science

Learning Objectives

Practice using the stack and the queue

Stack

```
 1  s = stack()
 2
 3  print(s.empty())
 4
 5  for i in range(0,20, 2):
 6      s.push(i)
 7
 8  print(s)
 9
10  x = s.pop()
11  print(x, s)
12
13  print(len(s))
14
15  print(s.top())
16  s.pop()
17  print(s.top())
18
19  print(s.empty())
20
21
22
23
```

Queue

```
1  q = queue()
2
3  print(q.empty())
4
5  for i in range(0,20, 2):
6      q.enqueue(i)
7  print(q)
8
9  x = q.dequeue()
10 print(x, q)
11
12 print(len(q))
13
14 print(q.front())
15 q.dequeue()
16 print(q.front())
17
18 print(q.empty())
```
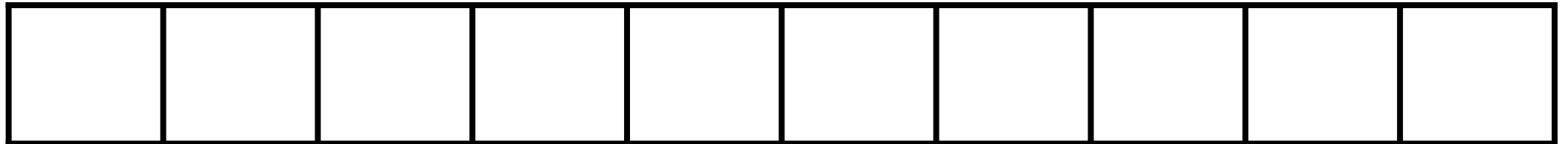
isBalanced

Consider when you know a string is unbalanced

Consider whether a stack or queue would be more useful to track this

Hint: The size of the quack will likely be very relevant to the answer!

spyEncode

'Solve' each operation separately. In other words, given three items:

1. How do I put them into a queue in the same order?

2. How do I put them into a queue in a rotated order?

3. How do I put them into a queue in reverse order?

Hint: You will likely need at least one variable to answer (2)

You will likely need at least one variable (or quack) to answer (3)

spyEncode

Once you've solved each operation, how do you cycle between them?

Hint: You will likely need at least one variable to keep track!

spyDecode

The spyDecode code is 90% identical to spyEncode

Hint: Which operation is not a direct mirror from spyEncode?

What minor change will undo that operation?