

MITx: 6.00.1x Introduction to Computer Science and Programming Using Python

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## L11 PROBLEM 6 (5/5 points)

For this exercise, you will be coding your very first class, a Queue class. Queues are a fundamental computer science data structure. A queue is basically like a line at Disneyland - you can add elements to a queue, and they maintain a specific order. When you want to get something off the end of a queue, you get the item that has been in there the longest (this is known as 'first-in-first-out', or FIFO). You can read up on queues at Wikipedia if you'd like to learn more.

In your Queue class, you will need three methods:

- 1. \_\_init\_\_\_: initialize your Queue (think: how will you store the queue's elements? You'll need to initialize an appropriate object attribute in this method)
- 2. insert : inserts one element in your Queue
- 3. remove: removes (or 'pops') one element from your Queue and returns it. If the queue is empty, raises a ValueError.

When you're done, you should test your implementation. Your results should look something like this:

```
>>> queue = Queue()
>>> queue.insert(5)
>>> queue.insert(6)
>>> queue.remove()
5
>>> queue.insert(7)
>>> queue.remove()
6
>>> queue.remove()
7
>>> queue.remove()
Traceback (most recent call last):
  File "<stdin>", line 26, in <module>
  File "queue.py", line 15, in remove
    raise ValueError()
ValueError
```

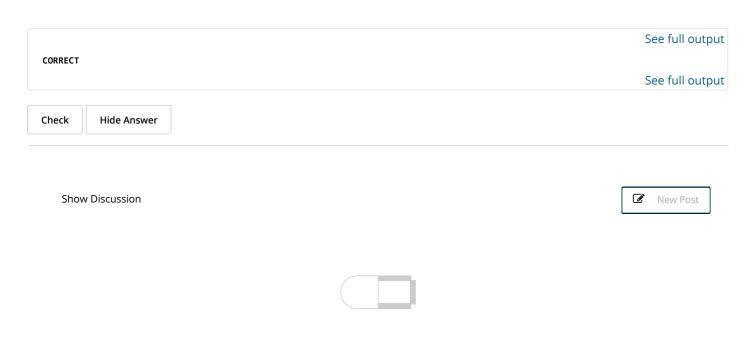
Be sure to handle that last case correctly - when popping from an empty Queue, throw the appropriate error.

```
1 class Queue(object):
      """ Queues are a fundamental computer science data structure.
 3
      A queue is basically like a line at Disneyland - you can add
 4
      elements to a queue, and they maintain a specific order.
 5
      When you want to get something off the end of a queue,
 6
      you get the item that has been in there the longest (this is
 7
      known as 'first-in-first-out', or FIFO). """
 8
9
            _init__(self):
           """Create an empty queue of integers"""
10
11
          self.vals = []
12
13
      def insert(self, e):
14
           """Assumes e is an integer and inserts e into self"""
15
          if not e in self.vals:
```

```
Help
```

```
class Queue(object):
   def __init__(self):
        "Initializes 1 attribute: a list to keep track of the queue's elements"
       self.qlist = []
   def insert(self, element):
        "Adds an element to the attribute list using append"
       self.qlist.append(element)
   def remove(self):
       "Removes an element from the attribute list"
       # Check if the list is empty; if so then raise a ValueError
       if self.qlist == []:
           raise ValueError()
       else:
           # Otherwise we want to remove the first element from the list
           # and return that to the user.
           element = self.qlist[0]
           self.qlist.remove(element)
            return element
           # Could also do this in 1 line:
           # return self.qlist.pop(0)
```

## Test results





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