Tutorial 11

Queues

1. Write out the content of the resulting queue after the following code is executed:

|  |
| --- |
| myQueue = Queue()  for i in range( 16 ):  if i % 3 == 0:  myQueue.enqueue(i) |

a.

The contents of the queue:

[0]:0 [1]:3 [2]:6 [3]:9 [4]:12 [5]:15

|  |
| --- |
| myQueue = Queue()  for i in range( 16 ):  if i % 3 == 0:  myQueue.enqueue(i)  elif i % 4 == 0:  myQueue.dequeue() |

b.

The contents of the queue:

[0]:6 [1]:9 [2]:12 [3]:15

|  |
| --- |
| myQueue = Queue()  for i in range( 16 ):  if i % 3 == 0:  myQueue.enqueue(i)  myQueue.enqueue(i + 1)  elif i % 4 == 0:  myQueue.dequeue() |

c.

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Data Structures & Algorithms



The contents of the queue:

[0]:3 [1]:4 [2]:6 [3]:7 [4]:9 [5]:10 [6]:12 [7]:13 [8]:15 [9]:16

|  |
| --- |
| myQueue = Queue()  for i in range( 16 ):  if i % 4 == 0:  myQueue.dequeue()  elif i % 3 == 0:  myQueue.enqueue(i) |

d.

AssertionError: Cannot dequeue from an empty queue.

1. Write a Python function – reverseQueue(Q) with no more than 6 lines of code, that reverses the order of the items in a queue. Your solution may only use the methods defined by the Queue ADT, but you are free to use other data structures if necessary

1. A double-ended queue, or deque (pronounced as “deck” to avoid confusion with the dequeue method of the regular Queue ADT) is a queue-like data structure that supports insertion and deletion at both the front and the back of the queue.

Define a Deque ADT by listing and describing the methods that should be supported by a Deque.

Deque() : Creates a new empty deque, which is a deque containing no items.

IsEmpty(): Returns a Boolean value indicating whether the deque is empty.

length(): Returns the number of items currently in the deque.

enqueue\_front(item): Adds the given item to the front of the deque.

enqueue\_back(item): Adds the given item to the back of the deque.

dequeue\_front(): Removers and returns the front item from the deque. An item cannot be dequeued from an empty deque.

dequeue\_back(): Removes and returns the back item from the deque. An item cannot be dequeued from an empty deque.

-- End of Tutorial --

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