Python Chapter 7: Stacks and Queues using Dequeue

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Basics of Stacks

When we want to utilize the full capabilities of a linked list we can use a Stack. Stacks are LIFO, Last in First out, meaning whoever joins the stack last is out first.

When we want to grab the element from the top of the stack, we use .pop() and it returns the last element.

For our implementation of a stack we will use the deque library from collections

Stack Example

```
# Python code to demonstrate Implementing
# Stack using deque
from collections import deque
queue = deque(["Ram", "Tarun", "Asif", "John"])
print(queue)
queue.append("Akbar")
print(queue)
queue.append("Birbal")
print(queue)
print(queue.pop()) # Returns Birbal
print(queue.pop()) # Returns Akbar
print(queue)
```

Basics of Queues

Queues are FIFO, First in First out, meaning whoever joins the queue first is out first. A great a analogy is thinking of a line to a movie, whoever is in front of the line is helped first.

For our implementation of a queue we will use the deque library from collections; however, we will use popLeft() to grab the first element

Queue Example

```
# Python code to demonstrate Implementing
# Stack using deque
from collections import deque
queue = deque(["Ram", "Tarun", "Asif", "John"])
print(queue)
queue.append("Akbar")
print(queue)
queue.append("Birbal")
print(queue)
print(queue.popleft()) # Returns Ram
print(queue.popleft()) # Returns Tarun
print(queue)
```

Dequeue Methods

```
# Python code to demonstrate Implementing
# Stack using deque
from collections import deque
queue = deque(["Ram", "Tarun", "Asif", "John"])
queue.append("Akbar")
queue.append("Birbal")
queue[-1] # Returns the first last element in O(1)
queue[0]  # Returns the last element
queue     # Returns True if the list has elements
```