

Python CS-521

Eugene Pinsky
Department of Computer Science
Metropolitan College, Boston University
Boston, MA 02215
email: epinsky@bu.edu

April 26, 2020

Abstract

This course will present an effective approach to help you learn Python. With extensive use of graphical illustrations, we will build understanding of Python and its capabilities by learning through many simple examples and analogies. The class will involve active student participation, discussions, and programming exercises. This approach will help you build a strong foundation in Python that you will be able to effectively apply in real-job situations and future courses.

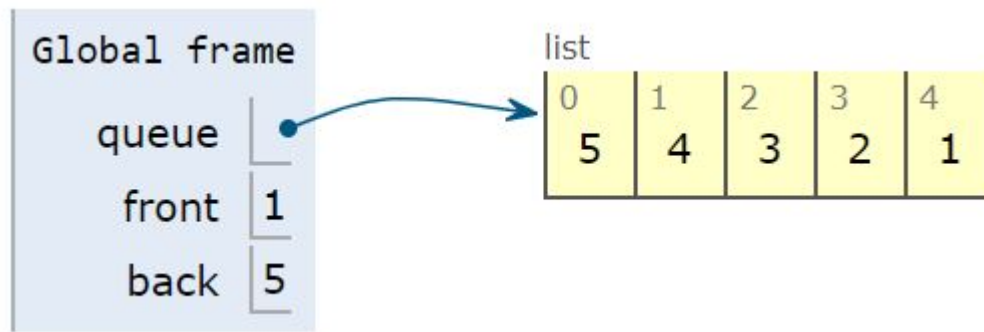
QUEUES

Queue

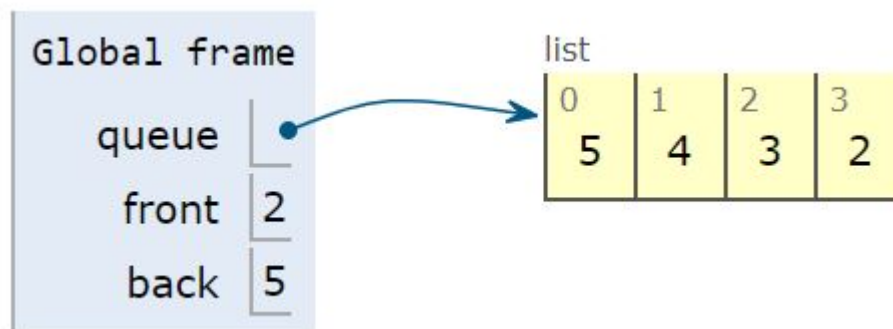
- a sequential collection
- Last-In-Last-Out
- principal operations:
 1. enqueue - add to the back of the queue
 2. dequeue - remove from front
- built-in types in some languages

Queue Example

- 1, 2, 3, 4, 5 are enqueued



- 1 is dequeued



Queue w. Python Lists

```
queue = []
```

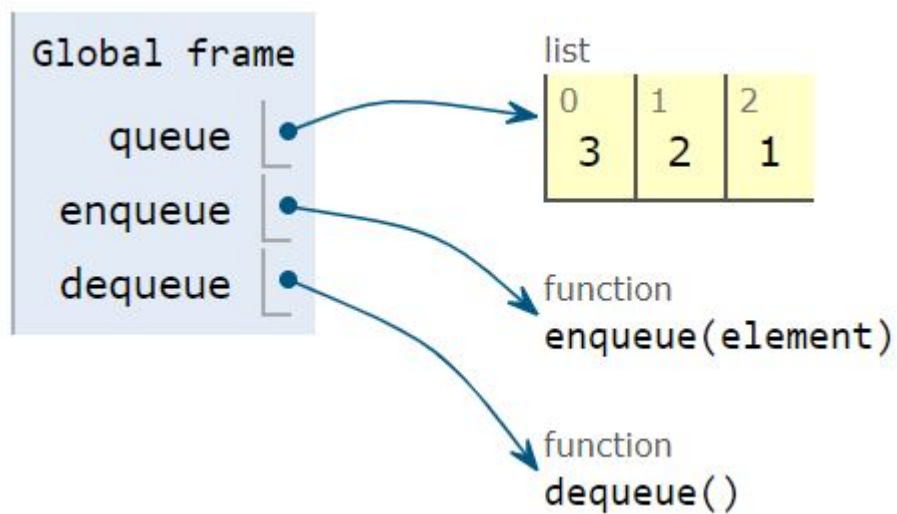
```
def enqueue(element):  
    global queue  
    return queue.insert(0, element)
```

```
def dequeue():  
    global queue  
    if len(queue) > 0:  
        return queue.pop(-1)  
    else:  
        return None
```

- use list mutability

Queue w. Lists (cont'd)

```
enqueue(1)
enqueue(2)
enqueue(3)
```

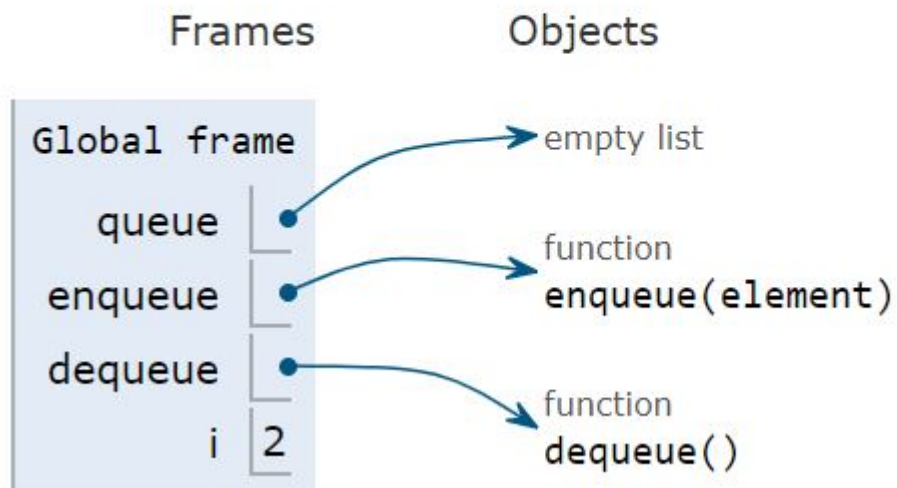


Queue w. Lists (cont'd)

```
for i in range(len(queue)):
    print(dequeue(), end=' ')
```

Print output (drag lower right corner to resize)

1 2 3



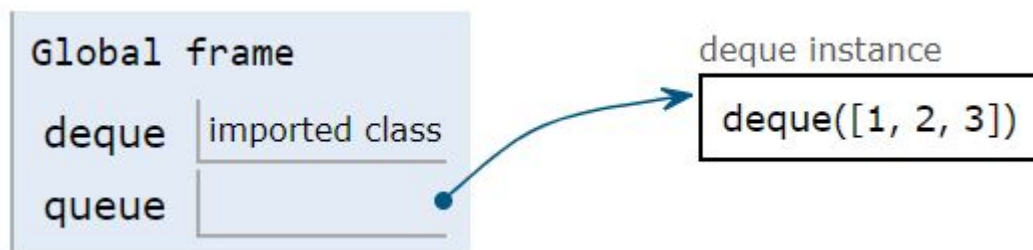
- First-In-First-Out (FIFO)

Queue with Collections

- use *deque* from *collections*
- *append()* implements *enqueue()*
- *popleft()* implements *dequeue()*

```
from collections import deque
```

```
queue = deque()  
queue.append(1)    # implements enqueue  
queue.append(2)  
queue.append(3)
```

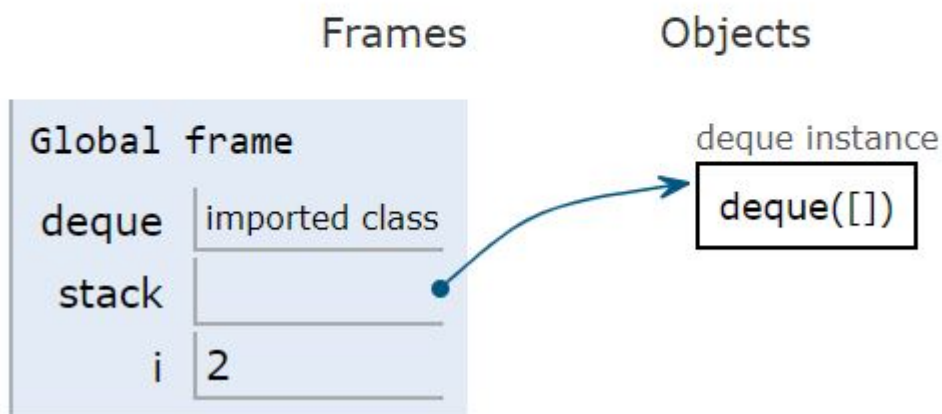


Queue with Collections

```
for i in range(len(queue)):
    print(queue.popleft(), end = ' ')
```

Print output (drag lower right corner to resize)

3 2 1



Python Queue Type

- import as a new type
- *put()* implements *enqueue()*
- *get()* implements *dequeue()*

```
from queue import Queue

queue = Queue(maxsize = 10)

queue.put(1)
queue.put(2)
queue.put(3)

for i in range(queue.qsize()):
    print(queue.get(), end=' ')
```