Quiz 4: Abstract Data Types

Read the code for the function **unravel**.

```
1  def unravel(L):
2      """Print elements of <L> and its nested sub-lists in level order.
3
4      @type L: list
5      @type q: Queue
6      @rtype: None
7      """
8      q = Queue()
9      for e in L:
10         q.enqueue(e)
11
12     while not q.is_empty():
13         i = q.dequeue()
14         # isinstance(i, list) returns True iff i is a list.
15         if not isinstance(i, list):
16             print(i)
17         else:
18             for e in i:
19                 q.enqueue(e)
```

For this quiz, when asked to draw the state of a queue, draw it with the front labelled, and queue elements separated by vertical lines. For example, if we enqueue 10, then 20, then 30, draw the queue like this: `front` → `10 | 20 | 30`

Consider the following code snippet that uses a queue:

```
1 >>> L = ['a', ['b', ['c', 'd'], 'e', 'f'], ['g', 'h', 'i'], 'j']
2 >>> unravel(L)
```

1. Draw the state of **q** during the function call `unravel(L)` at line 12 in **unravel**.

2. For each iteration of the `while` loop in `unravel`, write/draw two things:

   (i) What, if any, output is printed at line 16.

   (ii) The state of `q` at the *end* of the iteration (right after line 19).

Output (if any)	State of **q**

continue on reverse if needed