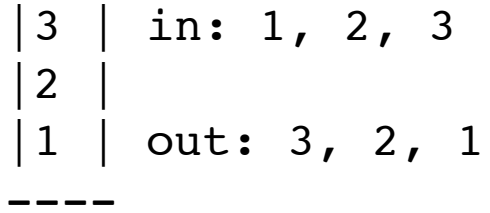
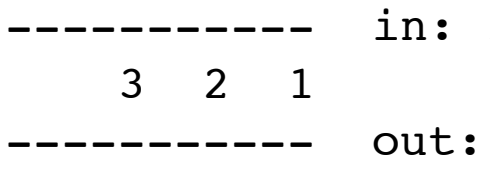
Stack - FILO (first in, last out)



in = push
out = pop

push 1
push 2
push 3
pop ------- 3
push 4
pop ------- 4
pop ------- 2

Queue - FIFO (first in, first out)



enQ 1
enQ 2
enQ 3

```
deQ ------ 1
enQ 4
deQ ------ 2
deQ ------ 3

class Stack {
    void push(int x);
    int pop();
    boolean isEmpty();
}


class Queue {

    // --- variable here
    Stack s;

    void enQ(int x) {
        s.push(x);
    }

    int deQ() {
        Stack helper;
        while (! s.isEmpty()) {
            helper.push(s.pop());
        }
        int result = helper.pop();

        while (! helper.isEmpty()) {
            s.push(helper.pop());
```

```
        }

        return result;
    }

}
```

```
A = [ 1, 4, 6, 8 ] len=4
B = [ 2, 3, 7 ] len=3

C = [ 1, 2, 3, 4, 6, 7, 8 ]
* assume all unique - fix it later
```

```
int[] mergeSortedArrays(int[] A, int[] B)
{
    int[] C = new int[A.length + B.length];
    int i=0, j=0, k=0;
    while (i < A.length || j < B.length)
    {
        if (i >= A.length) {
            C[k] = B[j];
            j++;
        }
        else if (j >= B.length) {
            C[k] = A[i];
            i++;
        }
        else if (A[i] < B[j]) {
            C[k] = A[i];
            i++;
        } else {
            C[k] = B[j];
            j++;
        }
        k++;
    }
    return C;
}
```

```
int[] mergeSortedArrays(int[] A, int[] B)
{
    int[] C = A.merge(B); // A and B
combined [ 1, 4, 6, 8, 2, 3, 7 ]
    C.sort();
    return C;
}
```