# Introduction to algorithms solution
# 3rd Edition
# chapter 10

Mark

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## 10.1-1

### Initalize

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

### PUSH(S,4)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 4 | 0 | 0 | 0 | 0 | 0 |

### PUSH(S,1)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 4 | 1 | 0 | 0 | 0 | 0 |

### PUSH(S,3)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 4 | 1 | 3 | 0 | 0 | 0 |

### POP(S)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 4 | 1 | 0 | 0 | 0 | 0 |

### PUSH(S,8)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 4 | 1 | 8 | 0 | 0 | 0 |

### POP(S)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 4 | 1 | 0 | 0 | 0 | 0 |

## 10.1-2

```
array_1.top = 0
array_2.top = n+1

PUSH(array_1,x)
1 if(array_1.top != array_2.top)
2     array1.top = array_1.top + 1
3     array_1[array_1.top] = x
4 else
5     error "stack is full"

PUSH(array_2,x)
1 if(array_1.top != array_2.top)
2     array2.top = array_2.top - 1
3     array_2[array_2.top] = x
4 else
5     error "stack is full"

STACK-EMPTY(array_1)
1 if array_1.top == 0
2     return false
3 else return true

STACK-EMPTY(array_2)
1 if array_2.top == n+1
2     return false
3 else return true

POP(array_1)
1 if STACK-EMPTY(array_1)
2     error "underflow"
3 else array_1.top = array_1.top - 1
4     return array_1[array_1.top]

POP(array_2)
1 if STACK-EMPTY(array_2)
2     error "underflow"
3 else array_2.top = array_2.top + 1
4     return array_1[array_2.top]
```

## 10.1-3