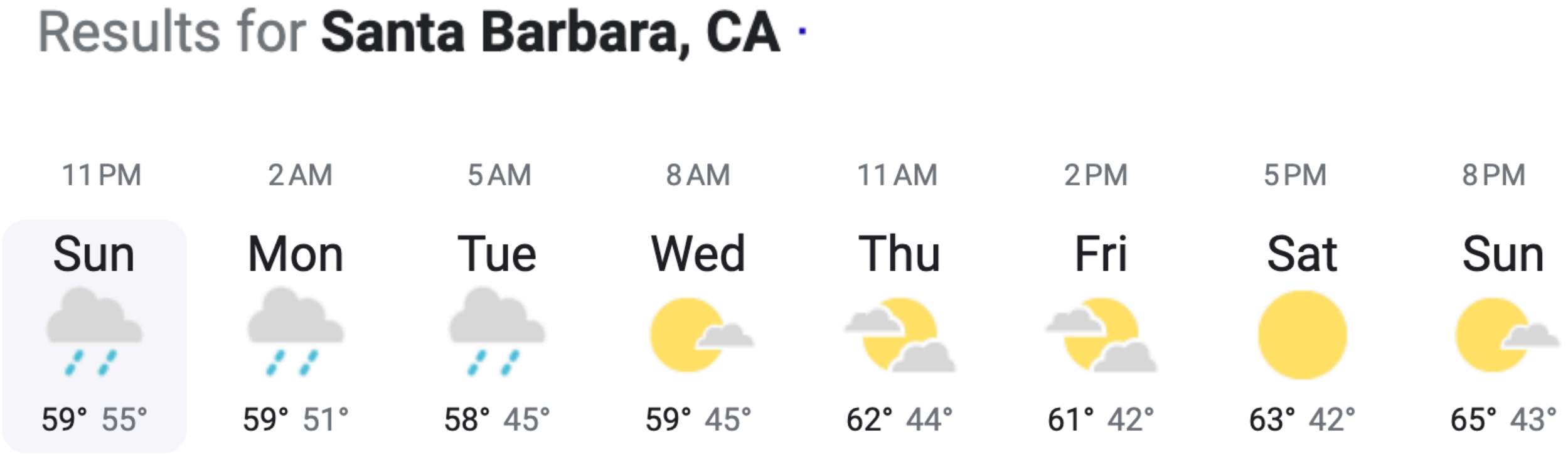
STACK

Problem Solving with Computers-II



https://leetcode.com/problems/daily-temperatures/

A stack is like a chisel — simple, yet powerful!

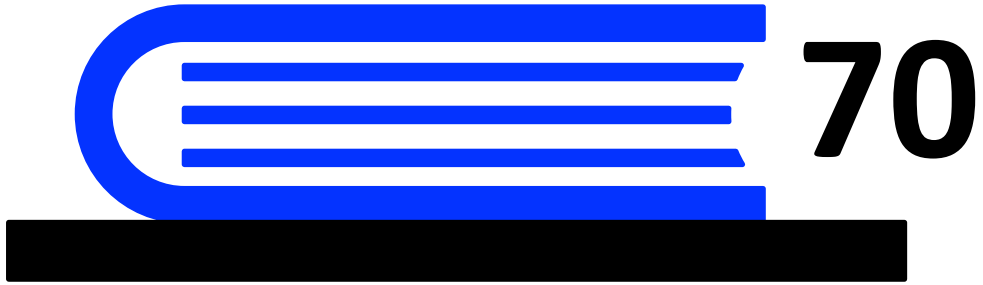
stack<int> s

Empty stack

Operations: **push()** **pop()** **top()**

stack<int> s

s.push(70)



Operations: **push()** **pop()** **top()**

stack<int> s

s.push(70)

s.push(50)

Operations: **push()** **pop()** **top()**

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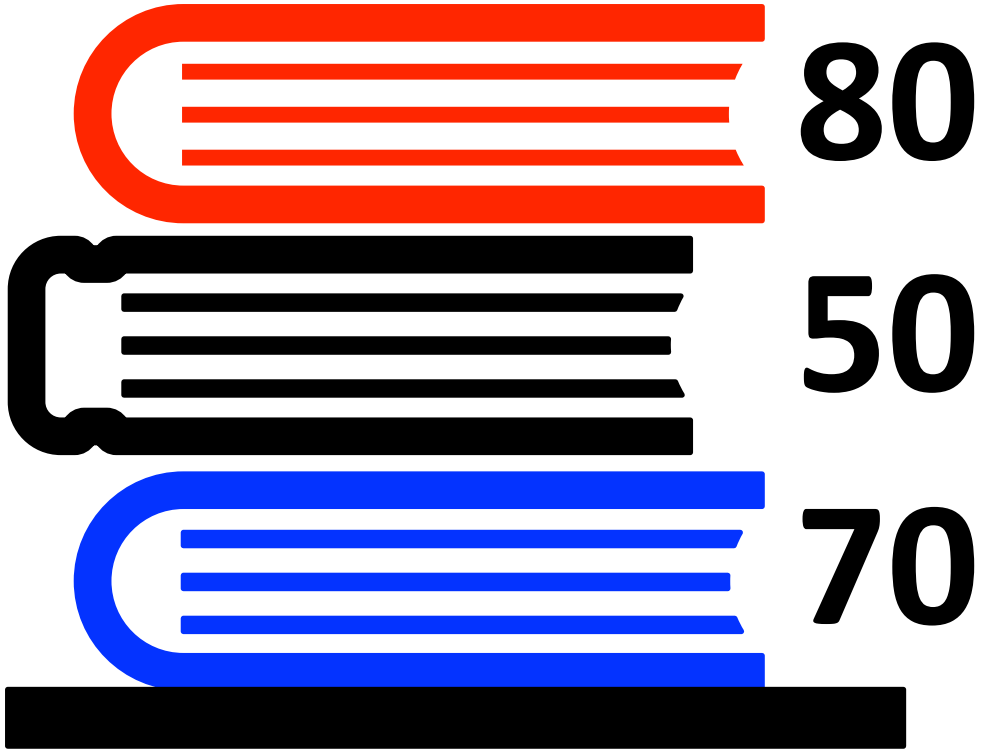
s.push(50)

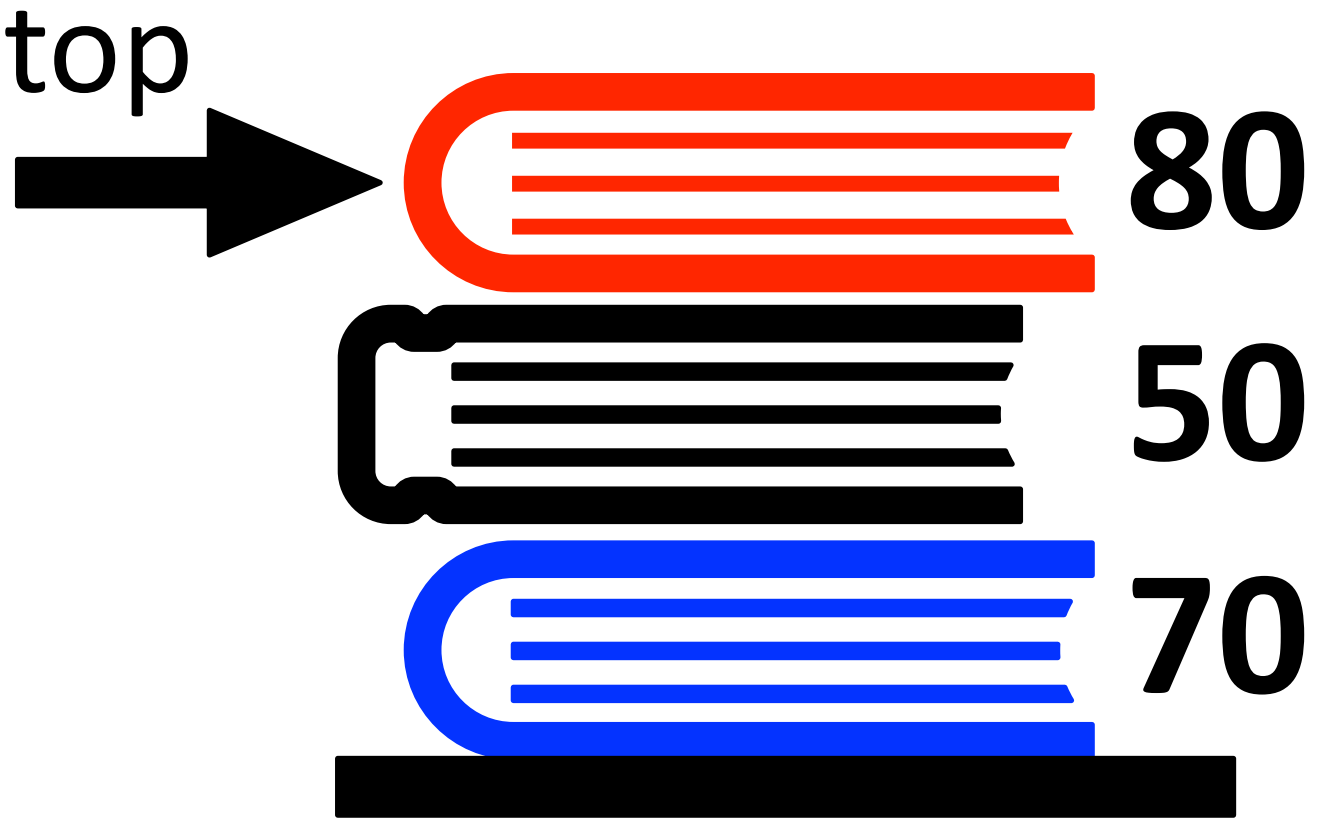
s.push(80)



Operations: **push()** pop() top()

```
stack<int> s
s.push(70)
s.push(50)
s.push(80)
```

s.top() returns 80



Operations: push() pop() **top()**

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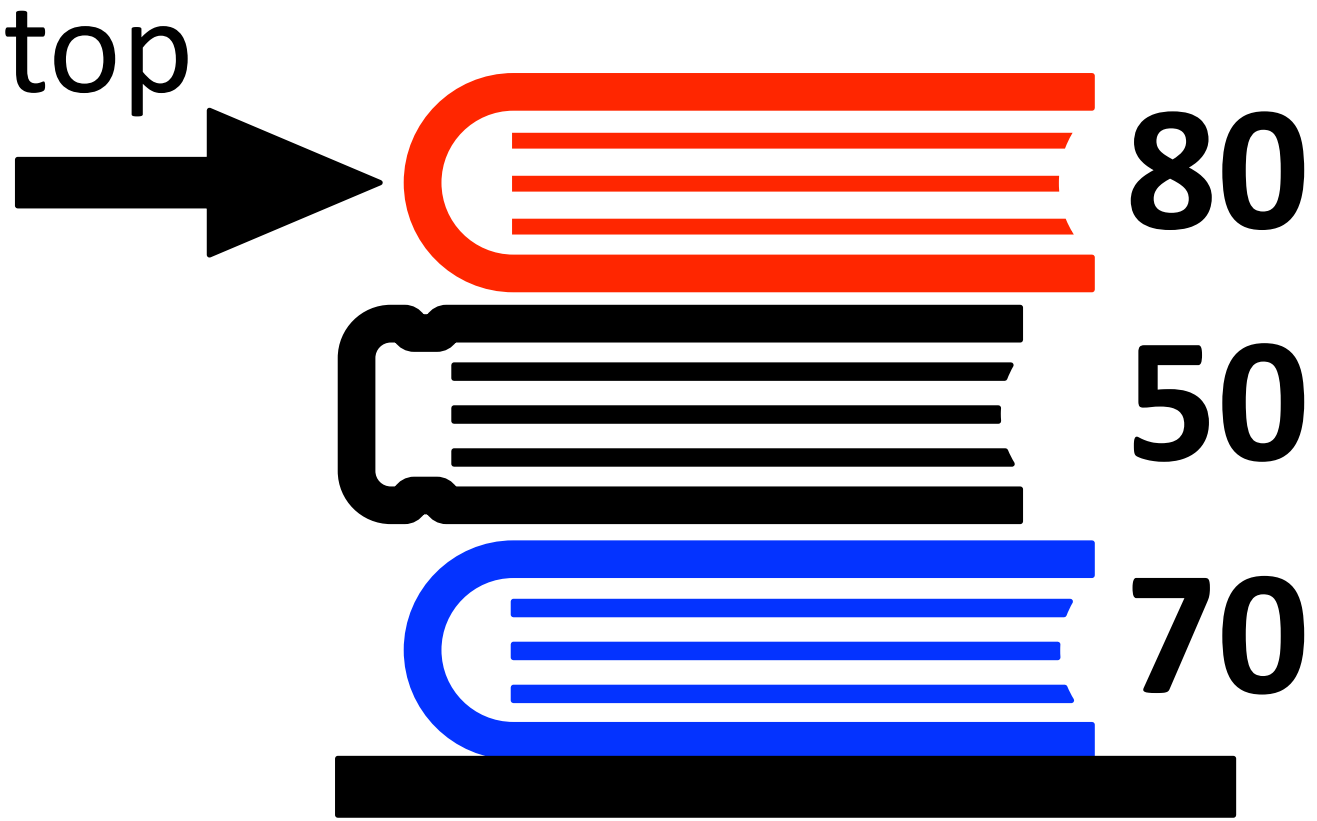
s.push(50)
s.push(80)


s.top()
```



s.pop() removes value that was pushed in *last*

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s.push(50)
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s.top()
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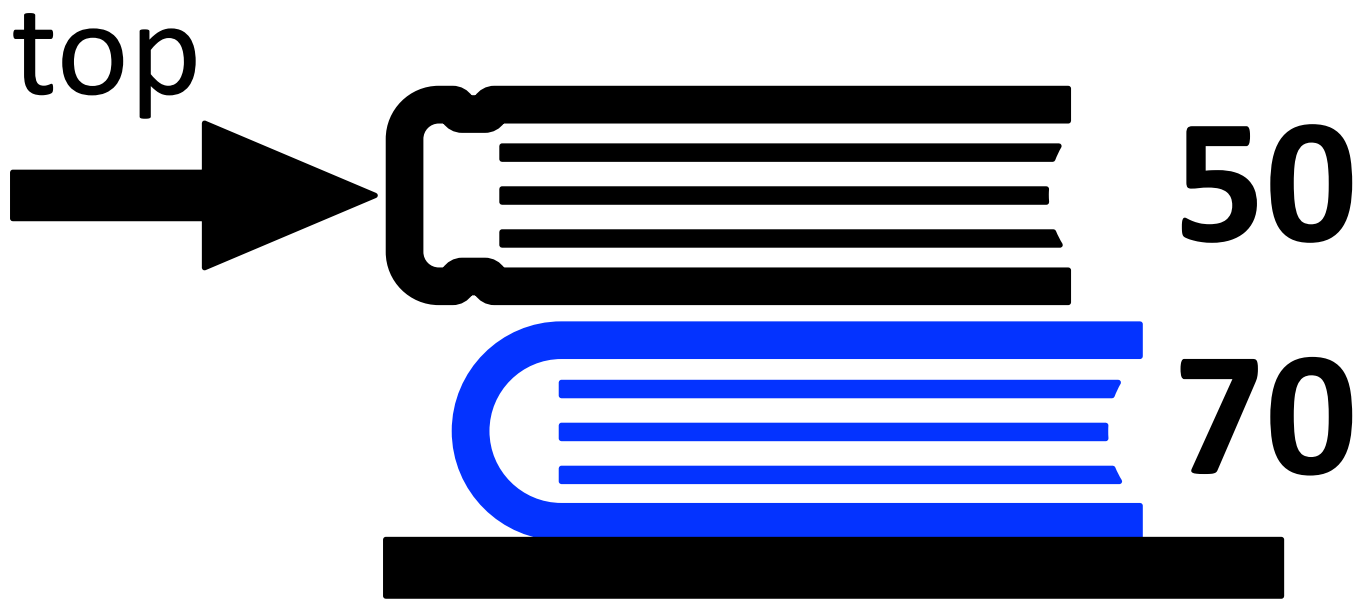
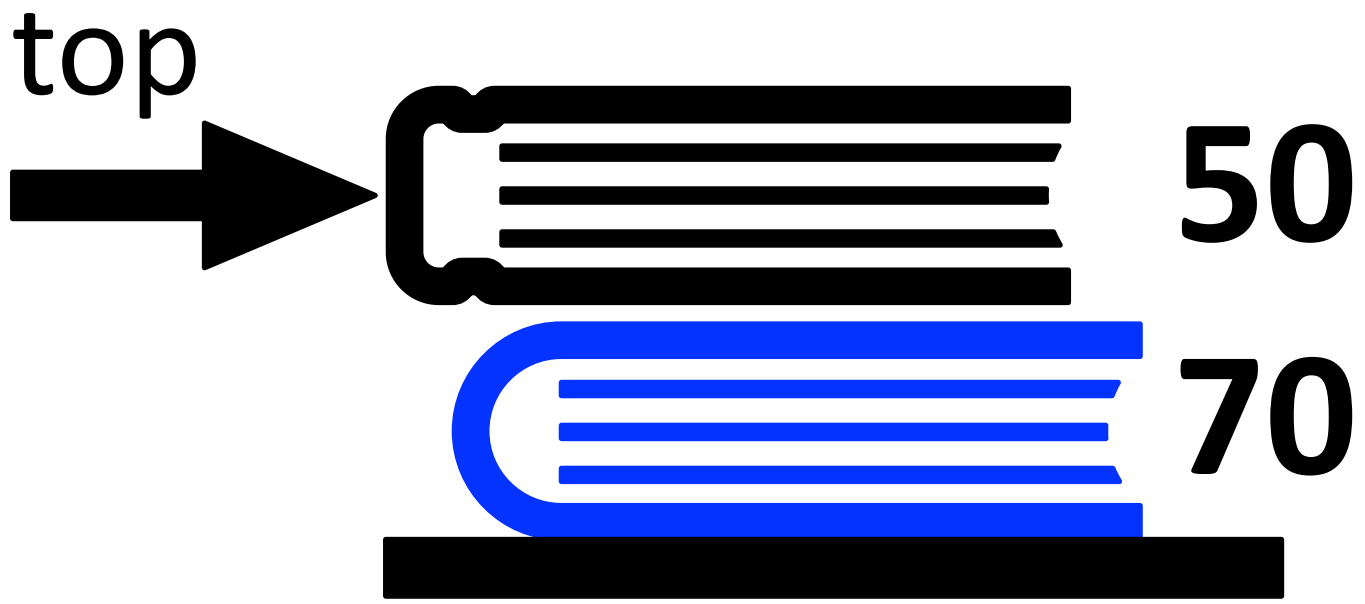


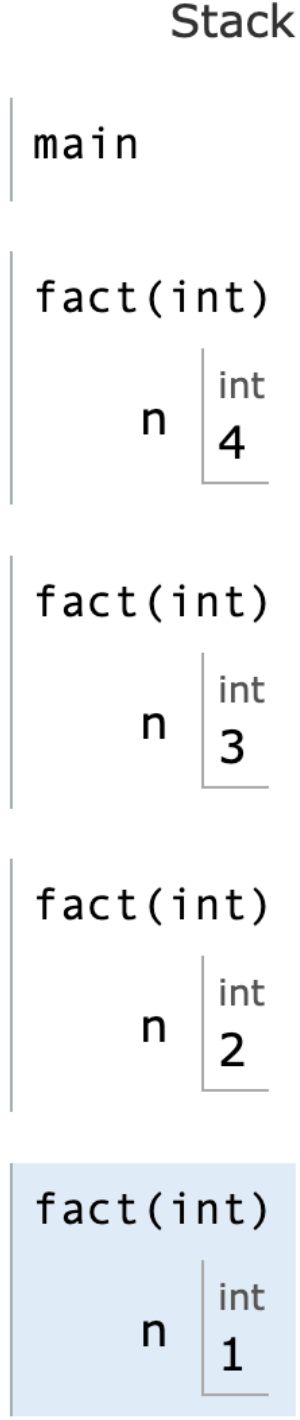
s.pop() removes value that was pushed in *last*



The Last value In is the First value Out (LIFO)

```
1  #include <iostream>
2  using namespace std;
3
4  int fact(int n){
5    if(n <= 1) return 1;
6    return n * fact(n - 1);
7  }
8
9  int main() {
10   cout<< fact(4) << endl;
11   return 0;
12 }
```

The call stack:



The Last value In is the First value Out (LIFO)

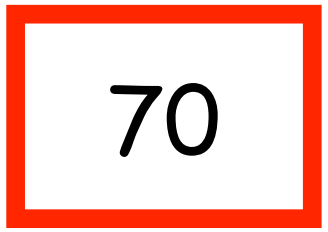
vector

list

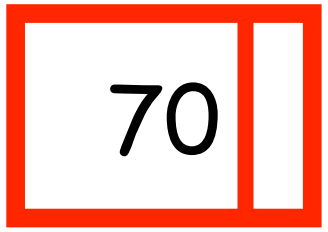
Empty stack

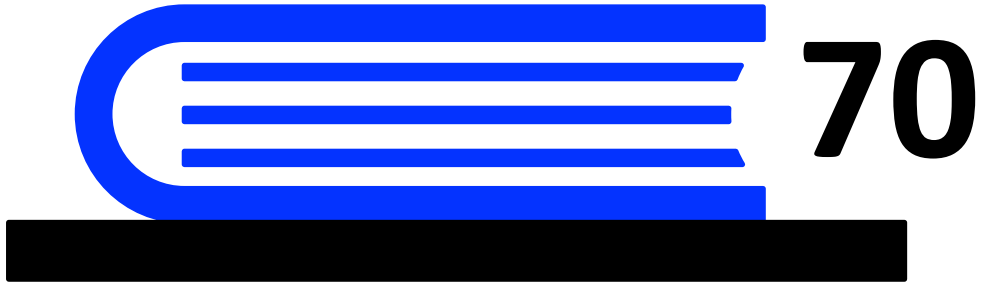
Stack Abstract Data Type

vector



list

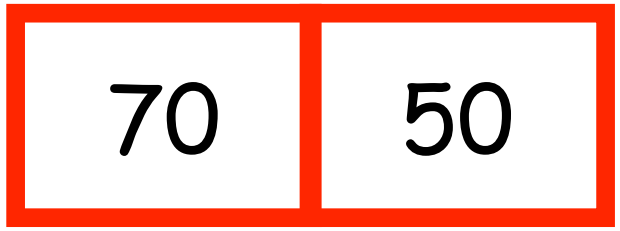




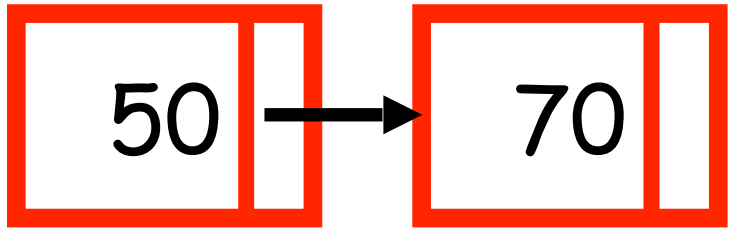
s.push(70)

Stack Abstract Data Type

vector



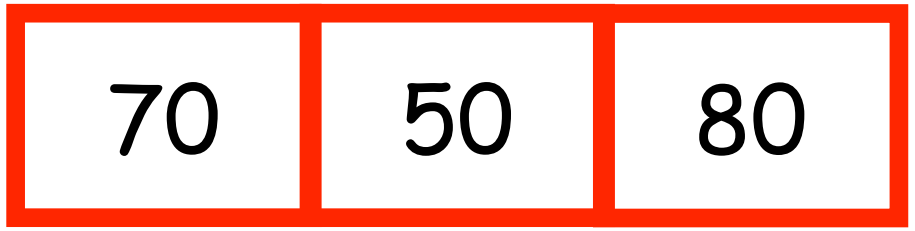
list



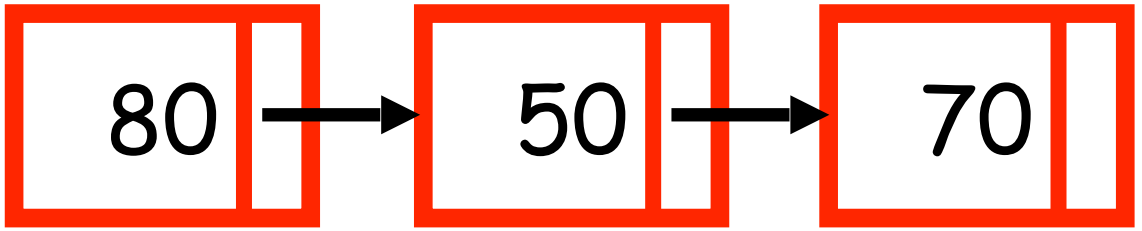
s.push(50)

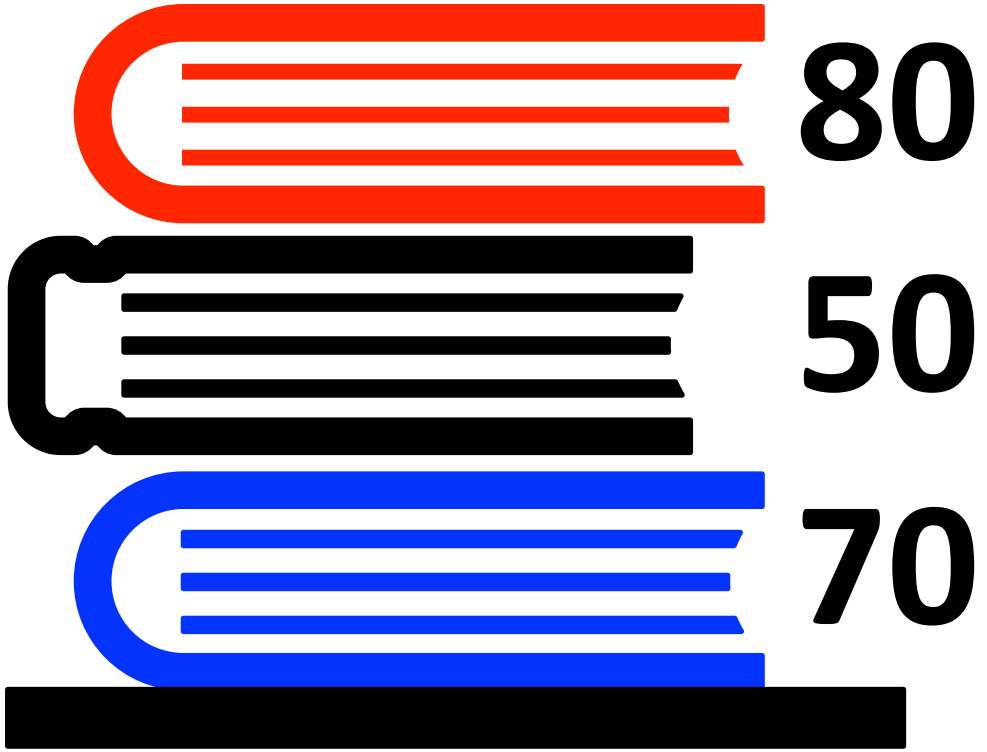
Stack Abstract Data Type

vector



list

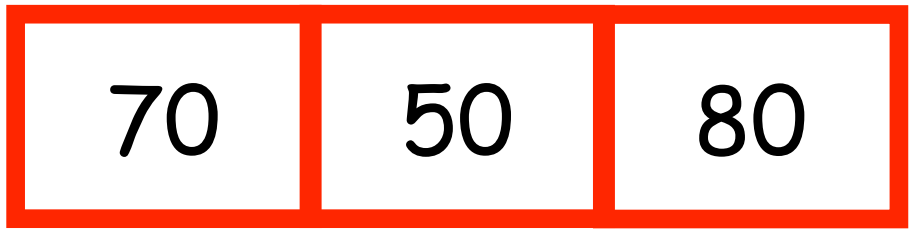


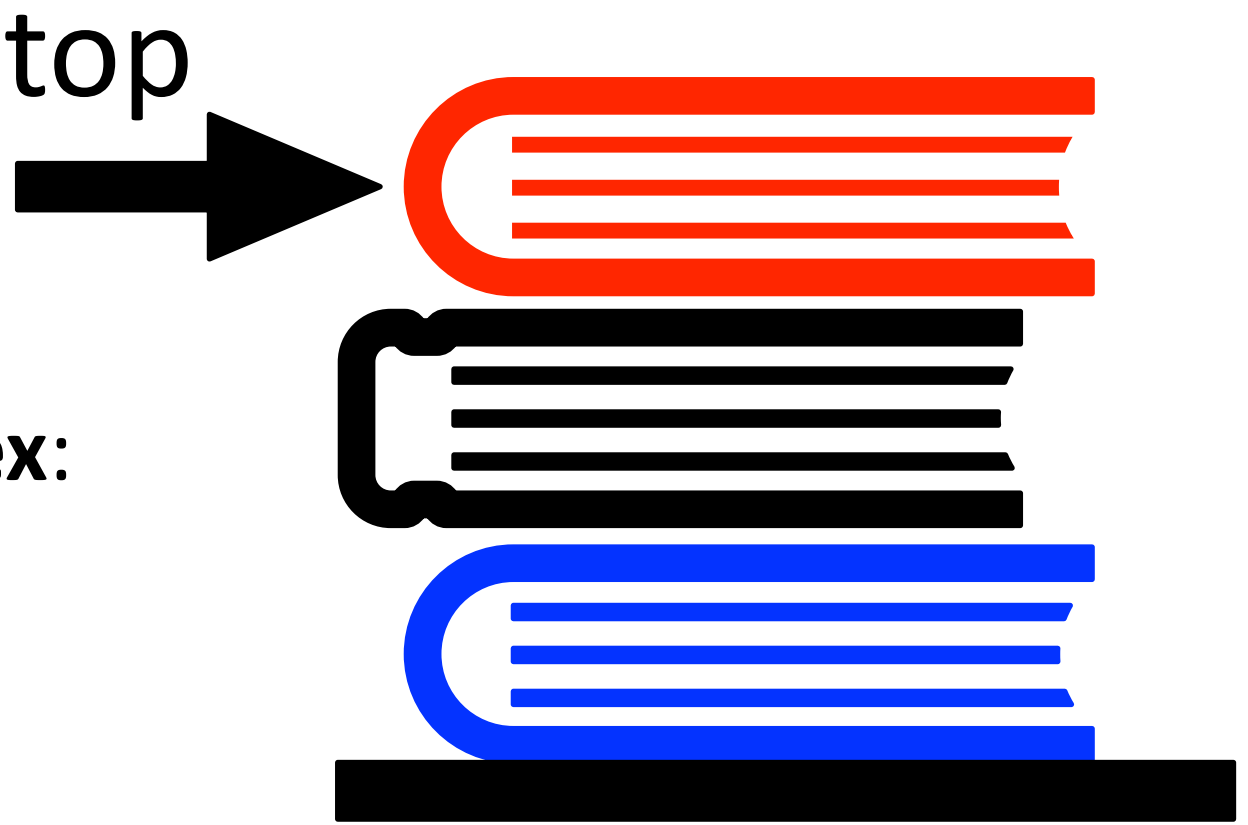


s.push(80)

Stack Abstract Data Type

vector

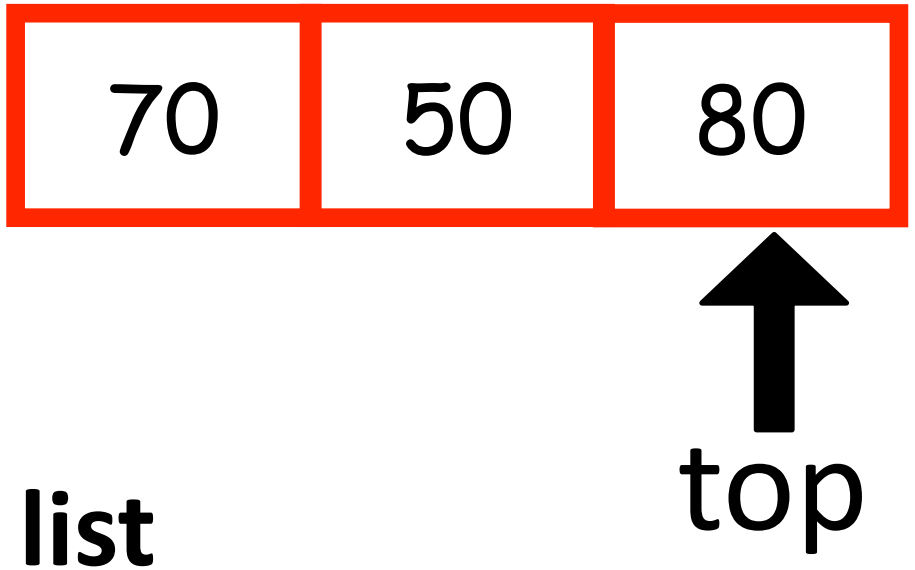




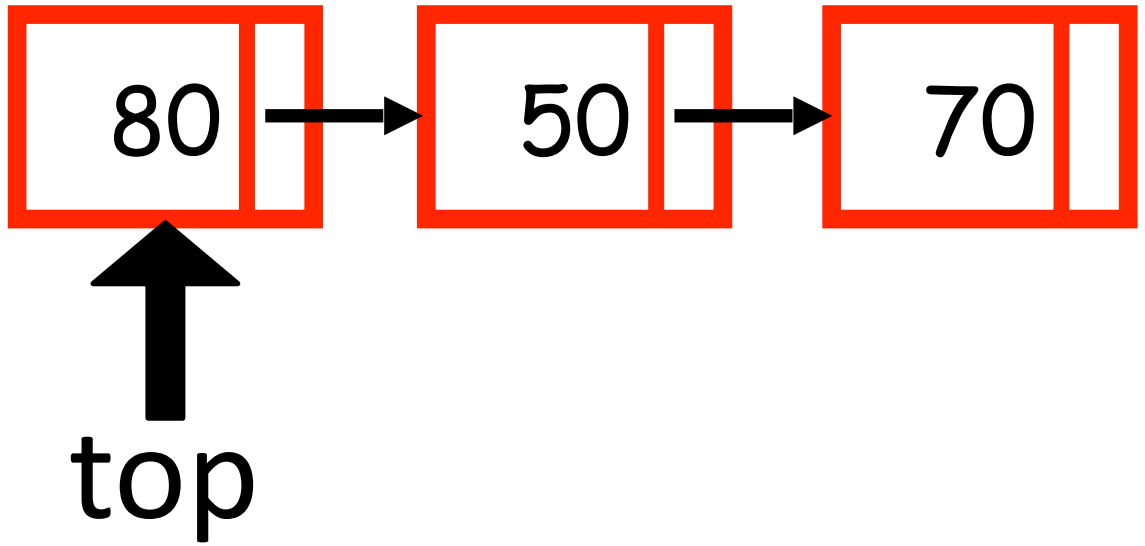
The top element is at **index**:

A. zero
B. one
C. v.size() - 1
D. v.size()

vector



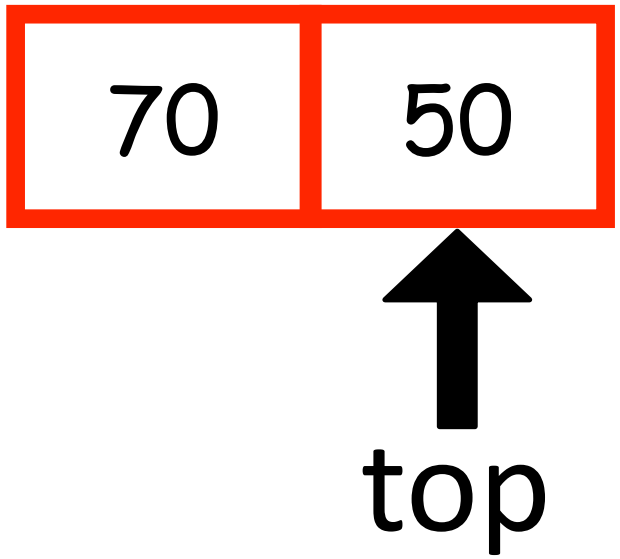
list



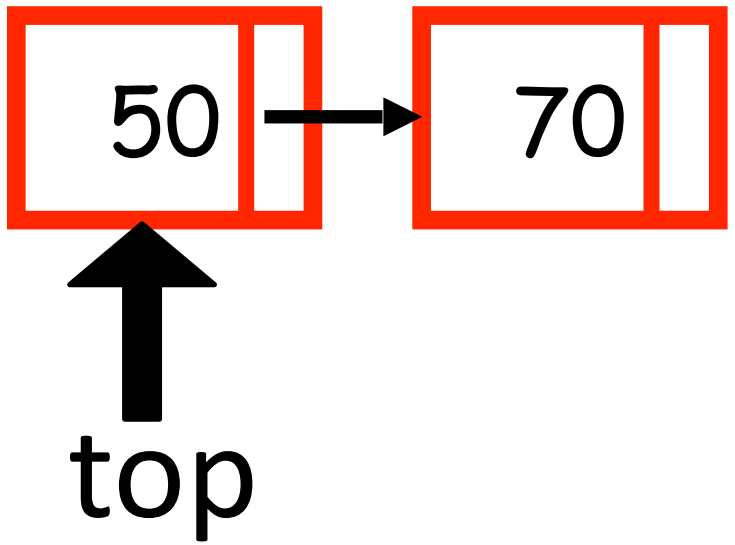
s.pop()

Stack Abstract Data Type

vector



list



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Stack Abstract Data Type

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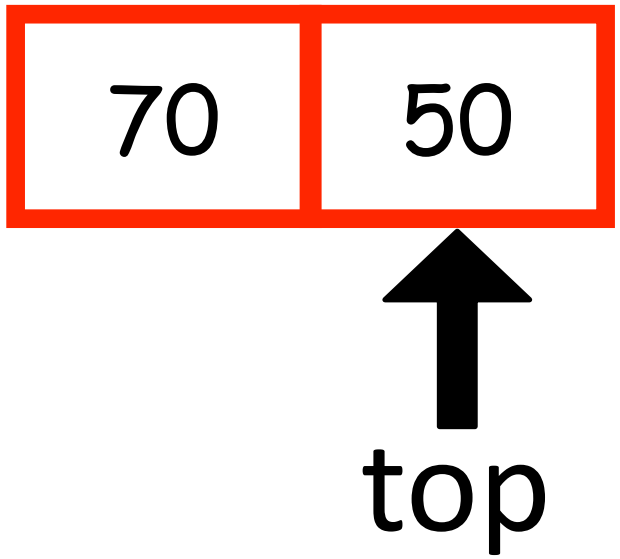

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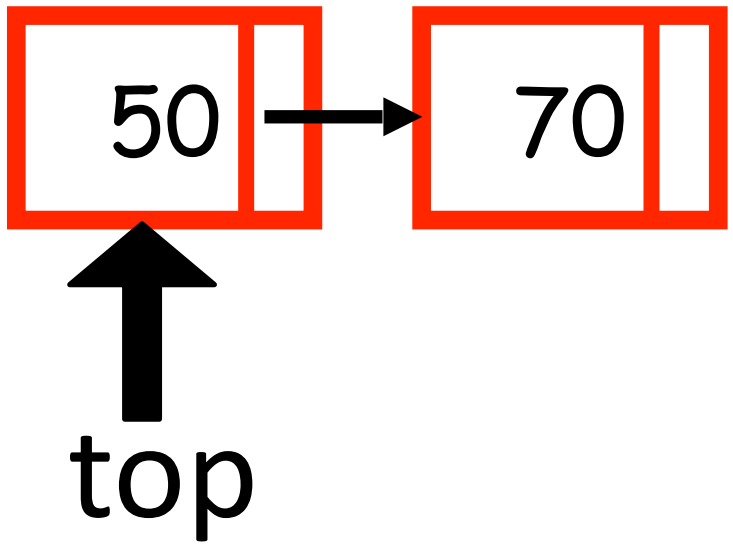
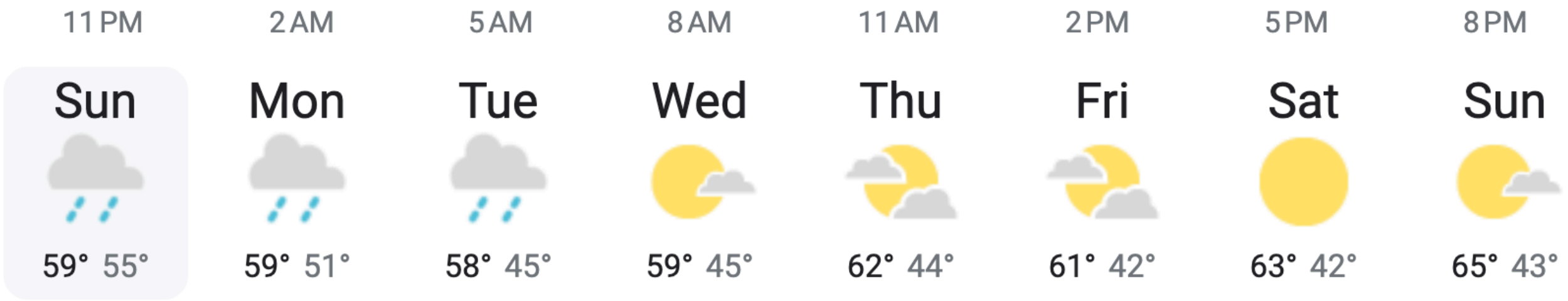


Stack Abstract Data Type

Why implement a stack at all?
After all a stack is a vector or list with a
reduced set of operations

Stack has only three operations: **push()** **pop()** **top()**

- **Attempt this problem on leetcode**
- **Spend no more than 30 minutes on it**
- **We'll discuss the solution on Wednesday**



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