Programación Competitiva

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Segundo semestre 2021

Primera Nota

- Examen de entrada 15%
- Repositorio Github 25%
- Primer Examen 60%
- Puntos extra en clase

GitHub

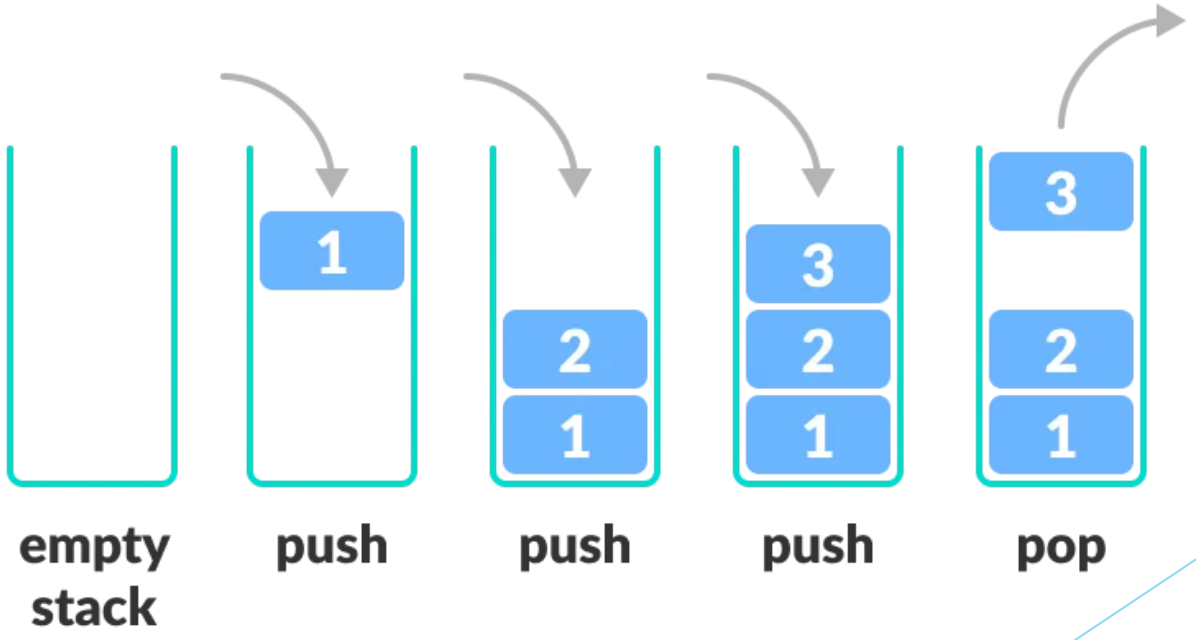
- Identificación
- readme
- License
- .gitignore
- Directorios para cada aula
- Nombres de archivos
- Message on commit

Stacks

Stacks

https://en.cppreference.com/w/cpp/container/stack

The `std::stack` class is a container adapter that gives the programmer the functionality of a stack - specifically, a LIFO (last-in, first-out) data structure.



Evaluate Reverse Polish Notation

https://leetcode.com/problems/evaluate-reverse-polish-notation/

Reverse Polish Notation (RPN) Writing “2 3 +” instead of “2+3”.

Valid operators are `+`, `-`, `*`, `/`.

Each operand may be an integer or another expression.

Note:

- Division between two integers should truncate toward zero.
- The given RPN expression is always valid. That means the expression would always evaluate to a result and there won't be any divide by zero operation.

Evaluate Reverse Polish Notation

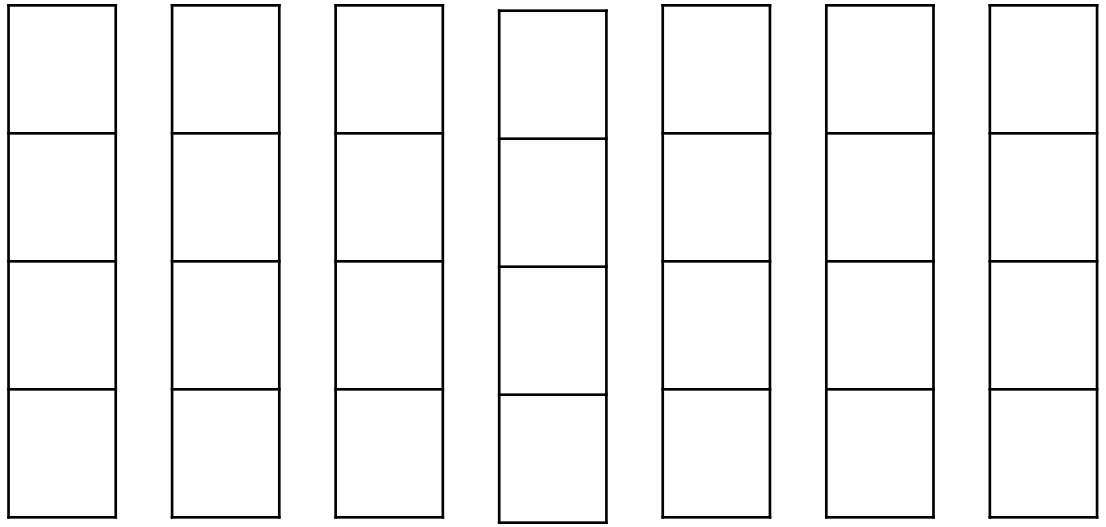
- Input: 2 1 + 3 *
- Output: 9

- Input: 4 13 5 / +
- Output: 6

- Input: 10 6 9 3 + -11 * / * 17 + 5 +
- Output: 22

Evaluate Reverse Polish Notation: Stacks

4	2	1	+	−	3	*



Stack

Minimum Add to Make Parentheses Valid

https://leetcode.com/problems/minimum-add-to-make-parentheses-valid/

Given a string S of '(' and ')', compute the minimum number of '(' or ')' that needs to be added so that the resulting parentheses string is valid.

Formally, a parentheses string is valid if and only if:

- It is the empty string, or
- It can be written as AB (A concatenated with B), where A and B are valid strings, or
- It can be written as (A), where A is a valid string.

Minimum Add to Make Parentheses Valid

```
Input: s = "())"
Output: 1

Input: "(()))("
Output: 2

Input: s = "((("
Output: 3

Input: s = "()))(("
Output: 4
```

LeetCode: Score of Parentheses

https://leetcode.com/problems/score-of-parentheses/

Given a balanced parentheses string `S`, compute the score of the string based on the following rule:

- `()` has score 1
- `AB` has score `A + B`, where A and B are balanced parentheses strings.
- `(A)` has score `2 * A`, where A is a balanced parentheses string.

```
Input: "(()(()))"
```

```
Output: 6
```

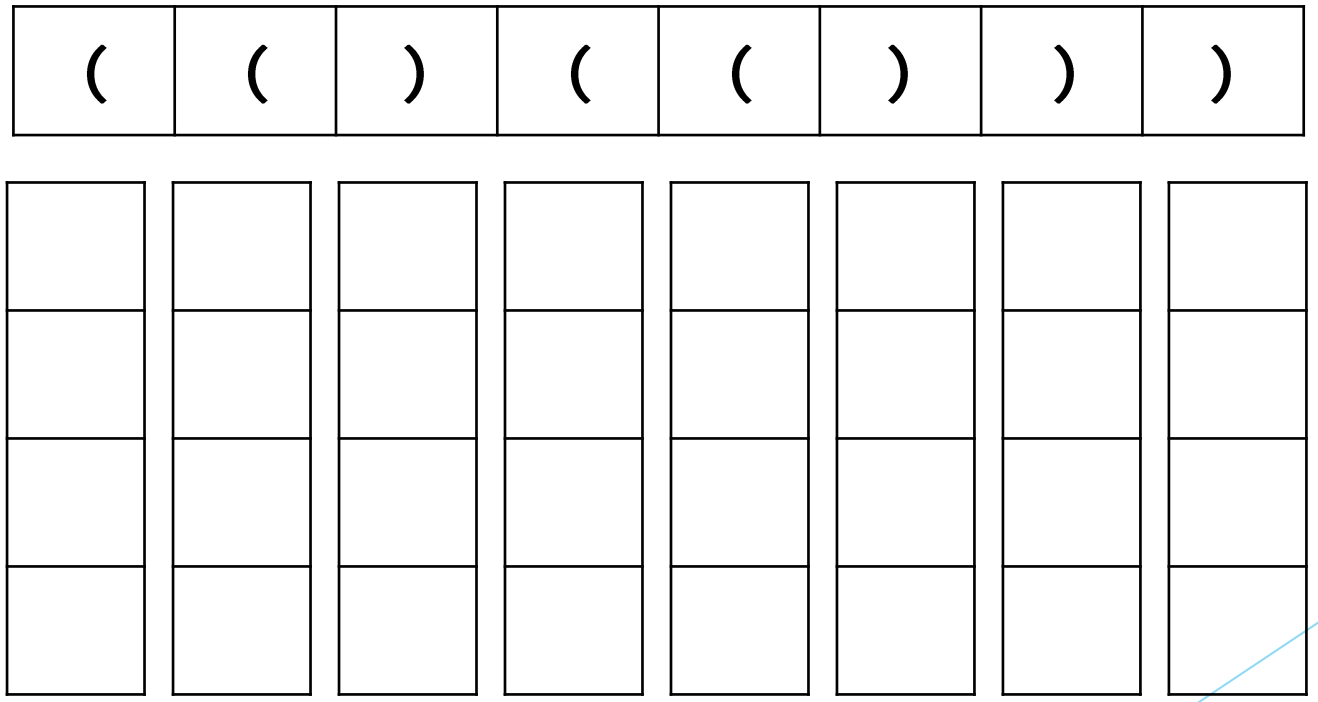
```
Explanation: "(()(()))" => "(1+(1))" => "(1+2)"  =>  "(3)"
```

Score of Parenthesis: Using Stacks

`()` has score 1

`AB` has score `A + B`, where A and B are balanced parentheses strings.

`(A)` has score `2 * A`, where A is a balanced parentheses string.



Pairing Socks

- https://open.kattis.com/problems/pairingsocks