

D-BAUG Informatik I

Exercise session: week 8

HS 2017

Homework

- Questions?

Use case

Reverse polish notation calculator.

A calculator with a stack.

Reverse polish notation (RPN) calculator

Supported operations

- `push(value)` push a value on top of the stack
- `pop()` pop and display value on top of stack
- `add()`, `subtract()`, `multiply()`, `divide()` basic arithmetic binary operations: pop values $v1$ and $v2$ from stack and push $v2$ `op` $v1$

Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$

4

Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1) / 2 = 5$$

push(2)

4

2
4

Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$

push(2)

multiply()

4

2
4

2
4

Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$

push(2)

multiply()

4

2
4

2
4

8

Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$

push(2)

4

2
4

multiply()

2
4

8

push(5)

5
8

Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$



Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$



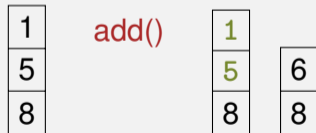
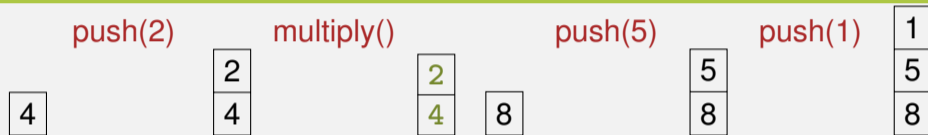
Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$



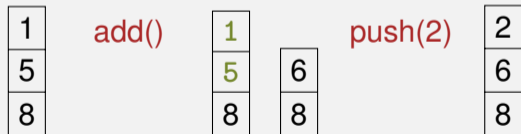
Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$



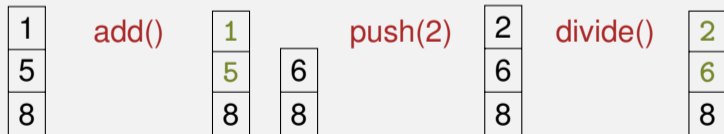
Reverse polish notation (RPN) calculator

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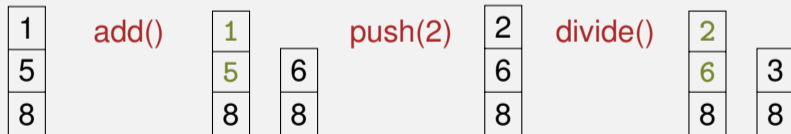
Reverse polish notation (RPN) calculator

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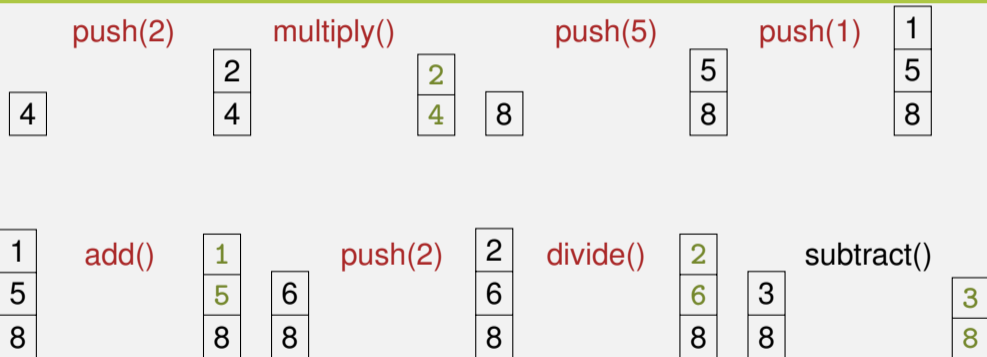
Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$



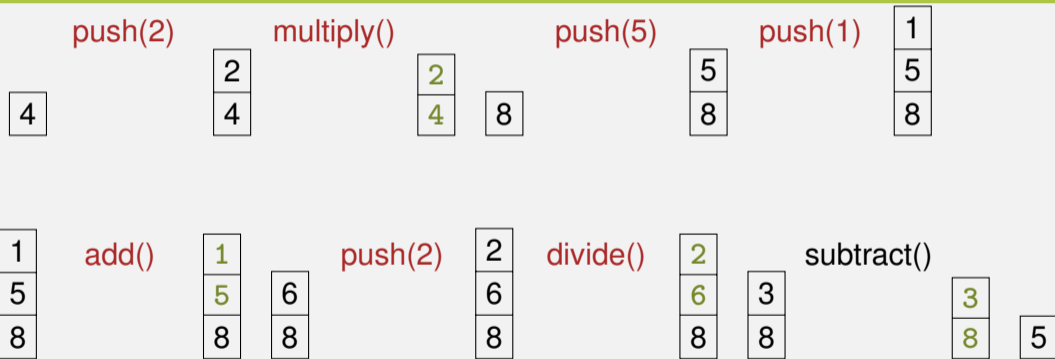
Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$



Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1)/2 = 5$$



Reverse polish notation (RPN) calculator

$$(4 \cdot 2) - (5 + 1) / 2 = 5$$

4 2 * 5 1 + 2 / - =

Commands:

- value \rightarrow push(value)
- = \rightarrow pop()
- +, -, *, / \rightarrow add(), subtract(), multiply(), divide()

Reverse polish notation (RPN) calculator

Implement the stack datastructure for the calculator.