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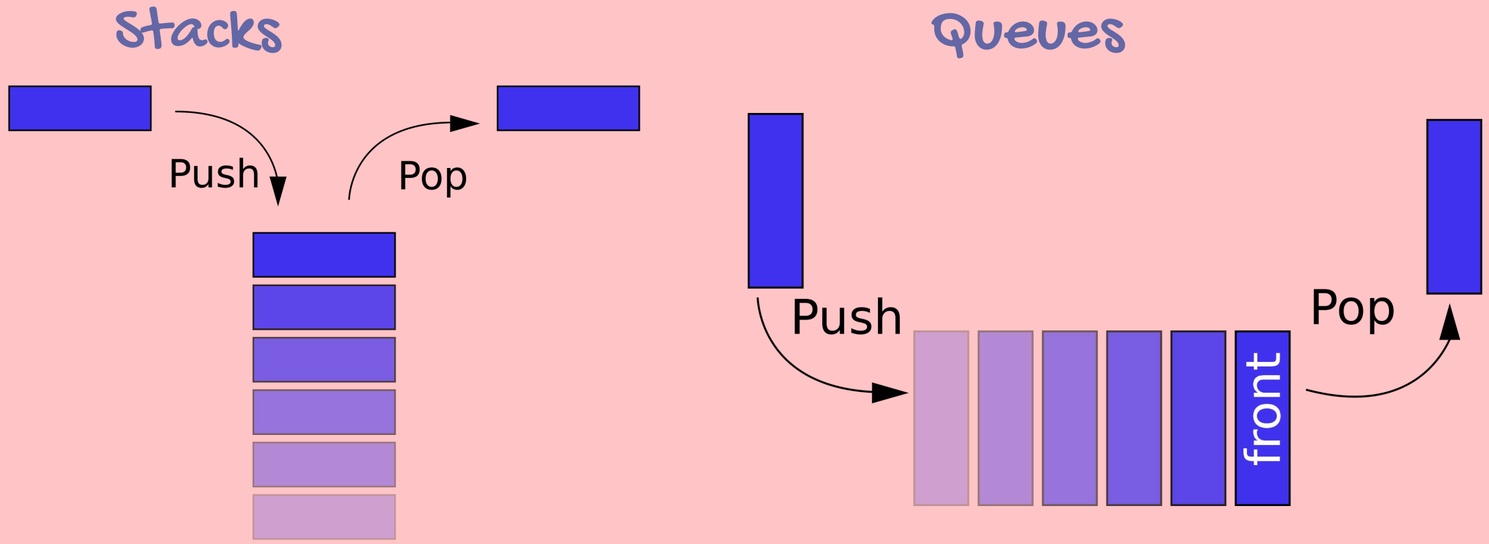
Stack and Queues

What are stacks and queues?

Stacks and queues are two fundamental data structures that are used in computer science. They are both linear data structures, meaning that the elements are stored in a sequential order. However, they differ in the way that elements are added and removed.



Definitions

Stacks

Queues

Stacks

A stack is a data structure that follows a Last In First Out (LIFO) order of operations. This means that the element that is inserted last is the first element to be removed. Stacks are often implemented using arrays or linked lists.

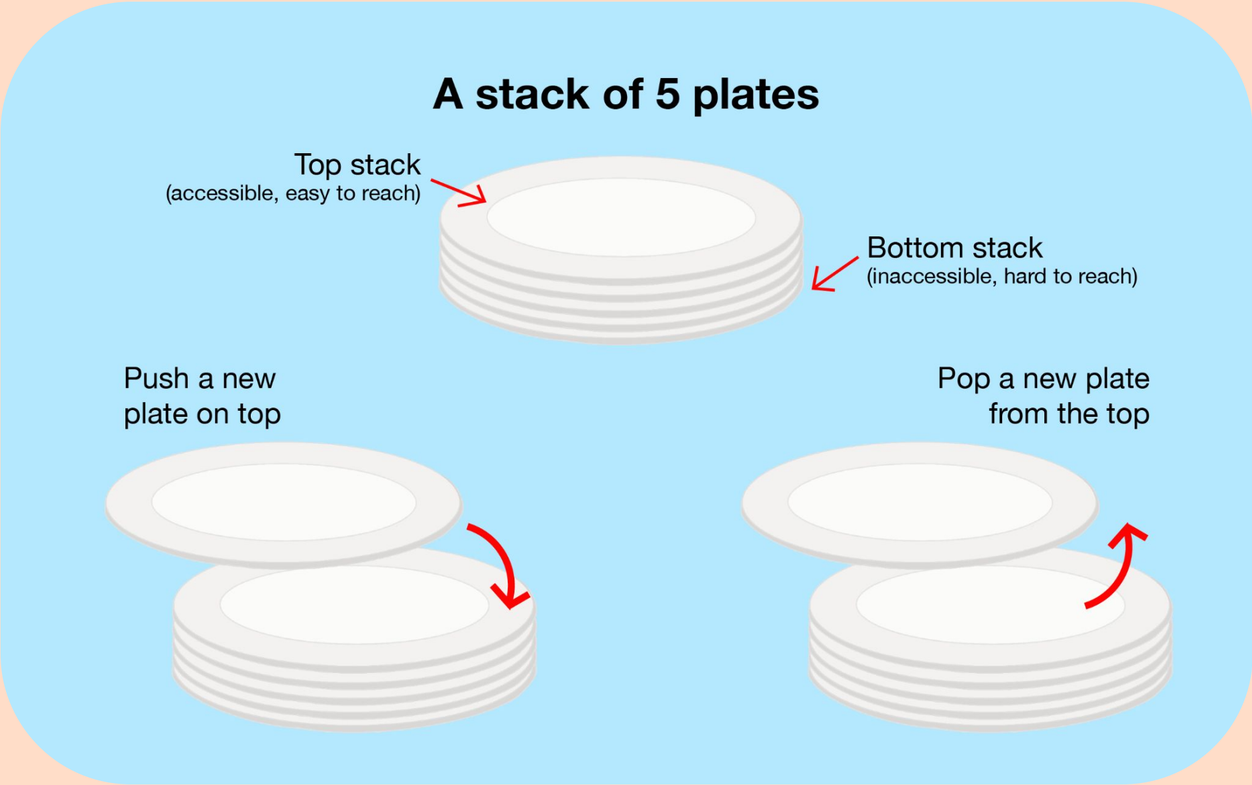
Queues

A queue is a data structure that follows a First In First Out (FIFO) order of operations. This means that the element that is inserted first is the first element to be removed. Queues are also often implemented using arrays or linked lists.

Properties of stacks and queues

Stacks and Queues

Stacks

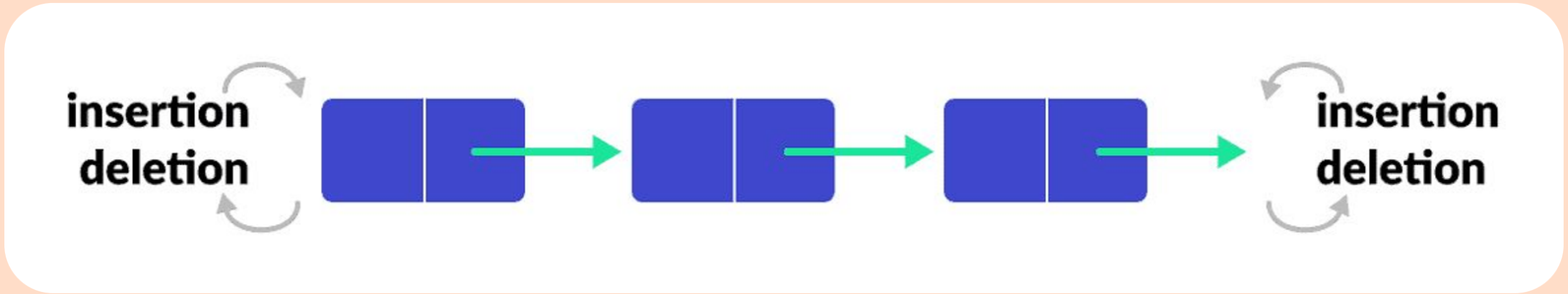


Stacks follow a LIFO order of operations.

Stacks can only be accessed from one end, the top.

Stacks are often used to implement function calls, undo/redo operations, and expression evaluation.

Queues



Queues follow a FIFO order of operations.

Queues can be accessed from both ends, the front and the back.

Queues are often used to implement job scheduling, message queues, and buffering data.

Applications

Real Life - Applications

Stacks

- Function calls
- Undo/redo operations
- Expression evaluation
- Backtracking algorithms
- Parsing expressions

Queues

- Job scheduling
- Message queues
- Buffering data
- Simulation
- Operating system scheduling

Thank you!