Stacks and Queues

There's a lot of worry and uncertainty in the world today, share one thing you will do to take care of yourself and your loved ones today 💙

What we're going to learn

- Understand abstract data types and concrete data structures at a deeper level

- Compare and contrast lists, stacks, queues

- Be able to explain stack and queue methods at a high level

Abstract Data Types

Abstract Data Type

- A model of data
  - Values
  - Operations
- Does not specify how these will be implemented
- List & Dictionary

- List ADT
  - Linked List
  - Array
  - Dynamic Array

What does a car need to do? (operations)

What is a car made out of, what color? (values)
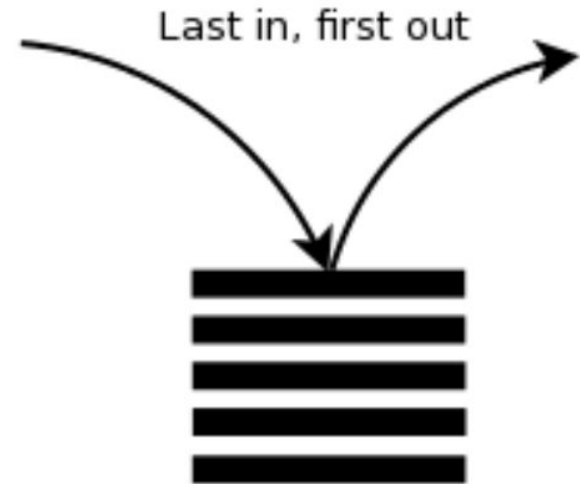
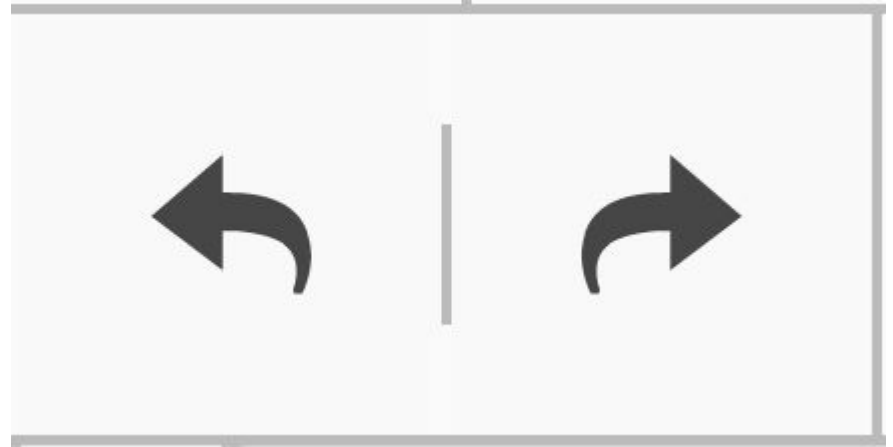There are many different ways to "implement" a car!

Stacks

MAKE SCHOOL

Stack:

Last in, first out

- Undo/ redo

- Moving backwards or forward on browser pages

- Interview questions

- What are some other applications and analogies?

Stack Methods

- Peek: look at the top

- Pop: remove the item at the top

- Push: put an item on the stack

Implementing a Stack

- A stack is an abstract data type

- We can implement a stack in different ways using concrete data structures

- Dynamic Array

- Linked List

In groups draw the push and pop methods using a

1. Dynamic Array

Let's Implement a Stack!
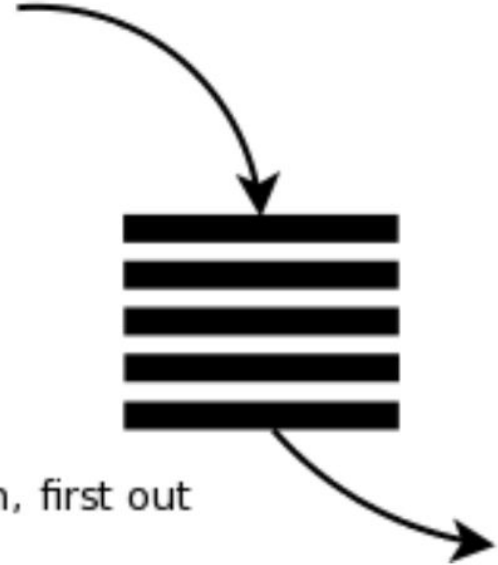
Queues

Queue:

First in, first out

Real World Applications

- Queues are used in operating systems for resource scheduling

- Networking and handling congestion

- Multiplayer gaming

- Processing real time data capture

- Interview Questions

- What are some other applications and analogies?

Queue Methods

- Enqueue: add to the queue

- Dequeue: remove from the queue

- Front: look at the front of the queue

- A queue is an abstract data type

- We can implement a queue in different ways using concrete data structures

- Dynamic Array

- Linked List

In groups draw the enqueue and dequeue methods using

1.   Dynamic Array

Let's Implement a Queue!

MAKE SCHOOL

Shout Outs