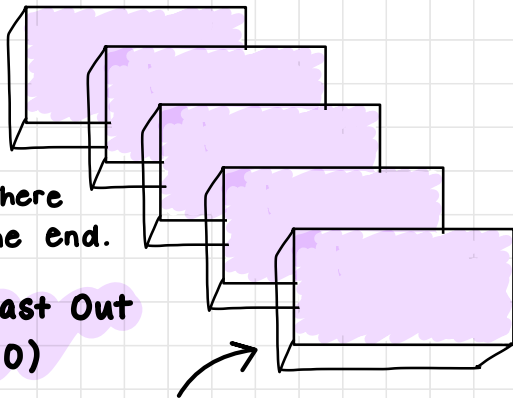# data structures
Stack

A stack is a linear data structure where data is added and removed at the same end.

Last In, First Out (LIFO)   or   **First In, Last Out (FILO)**

There is one pointer that keeps track of the top element.

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operations

POP $O(1)$
Remove element from the top of the stack

```
popped = Stack[topPointer];
topPointer--;
return popped;
```

PUSH $O(1)$
Insert new element to the top of the Stack.

```
newData = new StackElement;
topPointer++;
Stack[topPointer] = newData;
```

Overflow
We attempt to push an element(s) onto the stack when it is already filled to capacity.

Underflow
We attempt to pop from an empty stack.

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use cases

call stack

pattern matching

recursion

"undo" button