

Data Structures and Algorithms

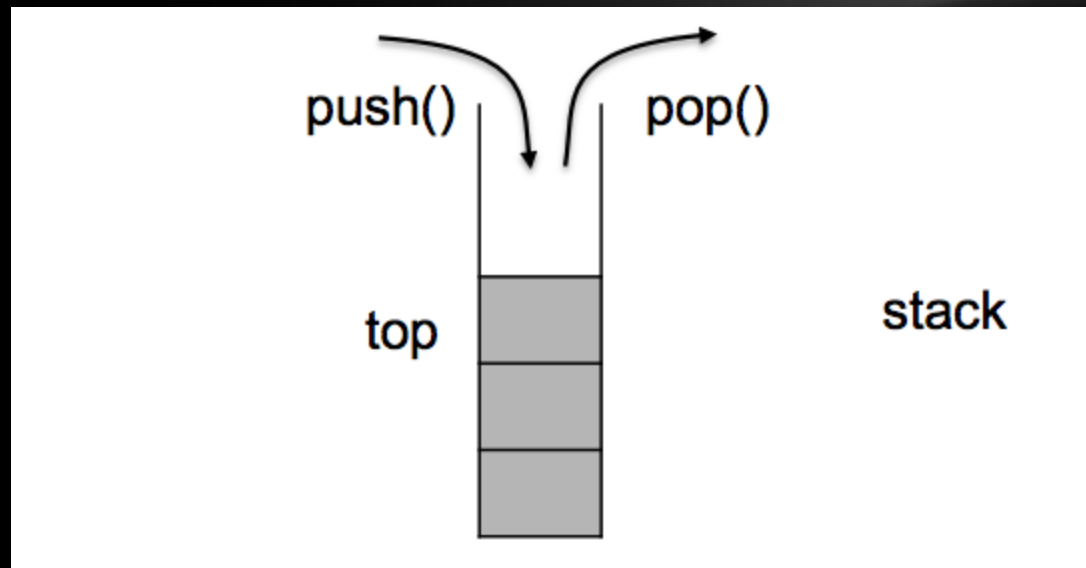
Lecture 5

Programming today is a race between software engineers striving to build bigger and better idiot-proof programs, and the universe trying to produce bigger and better idiots. So far, the universe is winning.

-Rick Cook

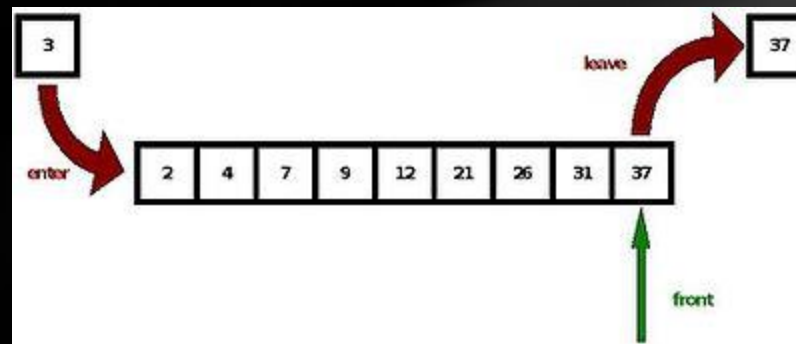
The Stack

- A stack is usually implemented through an array but it can be implemented with a list.
- Also called a LIFO – Last In First Out
- One important index of the array is the **stack head** (or top): the address of the last element written.



The Queue

- A queue is also implemented through an array but it can be implemented with a list, especially when you don't know the maximum length of the queue
- Also called a FIFO– First In First Out
- Two important index of the array is the **read index** (the address where the next element should be read from – or front) and the **write index** (the address where the next element should be written to – or back).



Example Applications

- Implement a generic queue and stack using structures.
- Read a word from the keyboard, then print it reversed on the screen. Use a stack.
- Real Life Interview question: How do you implement a queue only using stacks.

Thank you!

*Next lecture will require good knowledge of pointers. Recap!