STACKS

ABSTRACT DATA TYPE

- Model of a data structure
    - NOT the actual implementation
- Describes:
    - set of data values
    - the operations that can be performed
    - what the operations do (not how they do them...)
- Language independent
    - Helpful for approach/algorithm

STACK

- Collection of objects
- Last in - first out (LIFO)
- Primary operations:
    - push (add to top)
    - pop (remove from top)

REAL LIFE EXAMPLES:

- Piles of items at grocery stores
- Shopping cart corral
- Stack of plates
- Pez dispenser

WHEN TO USE?

- Depends on the problem
- Not useful for all problems
- But -- Really useful for some problems
- Something to consider before you start coding
    - algorithm stage -- which ADT makes sense to use

APPLICATION: POST-FIX NOTATION

- Infix:
  - what you're used to
  -
  - relies on order of operations and parentheses
  - Ex: 3 + 2 * 4
- Postfix:
  -
  - Ex: 3 2 4 * + 9*
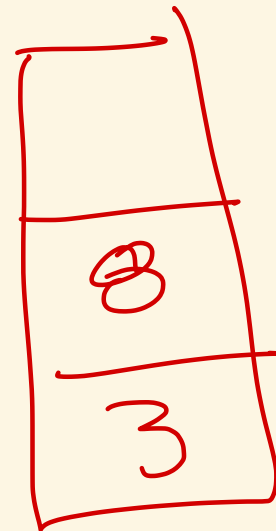
APPLICATION: POST-FIX NOTATION

- Computer has to parse math expressions
- Postfix is easier
- How could we write parser to turn expression into code?

CODING APPLICATIONS - OTHERS

- Reversing a string
- Back button in browser
- Undo/redo
- Balanced parentheses
- Maze solving
- Function call stack