

COP 3502 9/27/21

9:30 am

① Fri - Quiz 2
Mon - Travis
Wed - Fiona
Fri - Back Hopefully!

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② Stack Applications

① Evaluating Postfix Expression

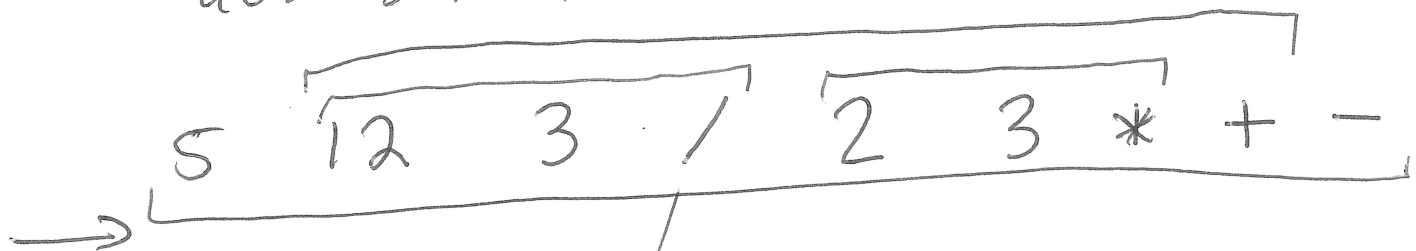
② Converting Infix to Postfix

③ Introduction to Queues

Postfix

3 7 + (HP Calculators)

add 3 to 7



3
3 26
10 12 4
5 -5

$$\begin{aligned} 12 / 3 &= 4 \\ 2 + 3 &= 6 \\ 4 + 6 &= 10 \end{aligned}$$

1) If you get an operand, push it onto the stack

2) If you get an operator, pop off OP2, then OP1 calculate OP1 op OP2 and push onto stack

Stack (operands) 5 - 10 = -5

if you ever try to pop off an empty stack $\Rightarrow$ INVALID ~~EX~~ POSTFIX EXPR

if you end with more than 1 value on the stack $\Rightarrow$ INVALID POSTFIX EXPR.

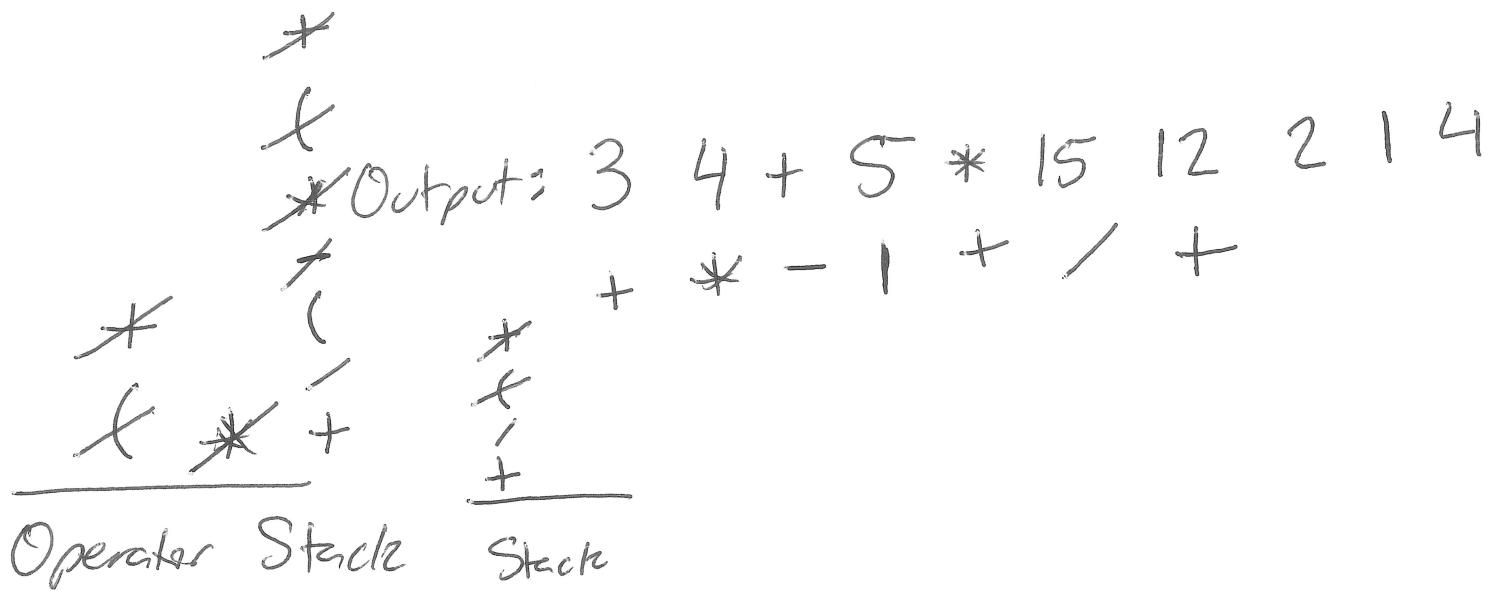
$$\left((6 \ 3 \ /) (4 \ 5 \ *) (12 \ 6 \ /) \ / \right) +$$

					6
		5	12	2	
3	4	20	20	10	
6	2	2	2	2	12
Stack	Stack	Stack	Stack	Stack	Stack
	6/3	4*5	12/6	20/2	2+10

Infix Ambiguity $3 + \underline{4 * 5}$ by default group this precedence!
 $(3 + 4) * 5$

Infix $\Rightarrow$ Postfix

$$(3+4)*5+15/(12-2*(1+4)+1)$$



- ① Open paren - push on stack
- ② Value (operand) - place in expr.
- ③ Operator: Pop off each operator on the stack of equal or greater precedence and place these in the expression. Then push the operator onto the stack.
- ④ Close paren - pop off each item until you hit an open paren, placing each item into the expression last pop of the open paren.
- ⑤ If at end, stack isn't empty, continue popping off items and placing them in the expression.

Stack: ~~operand~~ stack
operator

Output: Postfix Expression

- ① If get '(' just push onto stack
- ② If get operand, place it in the expression.
- ③ If get '-' just pop off each operator on the stack and place it into the expression until you hit the corresponding '('. (Pop that off and stop.)
- ④ If you get an operator, pop off each operator on the stack that is of equal or greater precedence and place it into the expression. (Stop if stack empty, hit '(', or you hit operator of lower precedence.) Push the operator onto the stack.
- ⑤ If stack isn't empty at the end, pop off each item and place it into the expression until it is.