Data Structures

Stack Homework 4

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Teaching, Training and Coaching since more than a decade!

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Problem #1: Stack with Delete Middle

- We would like to have a Stack with a function **delete_middle**() that deletes the middle element in O(1)
- E.g. if the current stack is [1, 2, 3, 4, 5], calling delete_middle() will make it [1, 2, 4, 5]
- **No need to code it.** Just outline an idea for the solution

Problem #2: Infix to Prefix

- In this program, we will implement an infix to prefix program
  - You will have to come up with its algorithm, which is very close to infix to postfix
  - Hint: **Reverse** the string input
  - Tip: Don’t use the coding tricks we did to shorten the code
- Input ⇒ Output
  - 1+2 ⇒ +12
  - **9-2+3 ⇒ +-923**
  - **4^3^2 ⇒ ^4^32**
  - 1+2+3 ⇒ ++123
  - 1+2*3 ⇒ +1*23
  - 2*3+4 ⇒ +*234
  - a+B-c ⇒ -+aBc
  - 1+3*5-8/2 ⇒ -+1*35/82

Many sites fail in these 2 cases

Problem #3: Remove Expression Brackets

- Given an expression containing single digit numerals,
  and the characters + - ( ), remove all brackets from the expression, and simplify it:
  - E.g. No unary digits (-5)

```
def RemoveBrackets(str):
```

- Input ⇒ output
  - 9-(2-3) ⇒ 9-2+3 [- is distributed inside the operators]
  - 9-(2-3) => 9-2+3
  - 1+2-3-4+5-6-7+8 => 1+2-3-4+5-6-7+8
  - 9+(2-3) => 9+2-3
  - 1-(2-3-(4+5))-6-(7-8) => 1-2+3+4+5-6-7+8
  - 1-(2-3-(4+5)+6-7) => 1-2+3+4+5-6+7
  - 1-(2-3-(4+5-(6-7))) => 1-2+3+4+5-6+7

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."