

# ECS 32B – Introduction to Data Structures

## Homework 02

### Important:

- Download the hw02.py file from Canvas -> Assignments -> Homework02.
- Write your code (**in Python3**) in the designated positions in hw02.py.
- The purpose of the homework is to practice using stacks. **The problems in all three functions must be solved using stacks.** The definition for Stack is included in hw02.py. If you didn't use the stack class
- To submit, upload hw02.py to Gradescope. Because of the way the autograder on Gradescope is configured, the file must be named hw02.py; otherwise, the test cases will not run and you will not get any points.
- You may upload as many times as you want before the deadline. Each time the autograder will let you know how many of the test cases you have passed/failed. To prevent people from manipulating the autograder, the content of half of the test cases are hidden.
- Please **do not copy others' answers**. Autograder can detect similar code. Also, for your own benefit, do not try to find solutions online.

### Function 1: postfixEval (14 test cases, total 32 points)

Write a function named postfixEval such that given a postfix expression, evaluate it and return the result.

Assumptions:

- the operands are floats
- the possible operators are +, -, \*, /
- the input expression is always a valid and non-empty postfix expression

Example: When input is ["2", "4", "7", "\*", "-"], which is  $2 - 4 * 7$  using infix notation, your function should -26.

### Function 2: validParentheses (29 test cases, total 35 points)

Given a (possibly empty) string containing only alphabet letters and parentheses "(", ")", "{", "}", "[", "]", determine if the string is valid.

A string is valid if

- Open brackets must be closed by the same type of brackets.
- Open brackets must be closed in the correct order.

Example: Given input "(ab){[]}", your function should return True.

### **Function 3: reverseString (10 test cases, total 33 points)**

Given a (possibly empty) string, reverse it.

Example: Given input "abcde", your function should return "edcba".