

Homework 2

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Due March 25

1. (50 pts)

(a) (10 pts) Specify an integer stack ADT that can push and pop integers.

(b) (20 pts) Implement the ADT specified in (a).

(c) (20 pts) Write a program that takes as input an arithmetic expression in a fully parenthesized infix form, evaluates the expression and prints it out.

(You can assume that there are only four operations: +, −, * and / where / is an integer division that discards the fractional part of the operation result and that the operands are all integers.)

Example) Input “((3+5) * ((16/3) − 2))” evaluates to “24”.

2. (50 pts)

(a) (10 pts) Specify a priority queue ADT for airline flight reservation, which has only three different priorities, i.e. first-class, business-class and economy-class.

(b) (20 pts) Implement the ADT specified in (a).

(c) (20 pts) Write a program that takes as input a sequence of reservation requests in the form of

Input form	Note
(“Adam Smith”, 3)↵ ¹	¹ ↵ is a enter input
(“John Galbraith”, 2)↵	² ... is ellipsis.
(“Joseph Schumpeter”, 2)↵	³ “done” means the end of inputs.
... ²	
(“John M. Keynes”, 1)↵	
done ³ ↵	

where 1 stands for first-class, 2 for business-class and 3 for economy-class, and prints out the reservation requests in the order of their priorities on the first-come first-served basis. Therefore for the above example input, the output should be

Output form
(“John M. Keynes”, 1)(“John Galbraith”, 2)(“Joseph Schumpeter”, 2)(“Adam Smith”, 3) ...