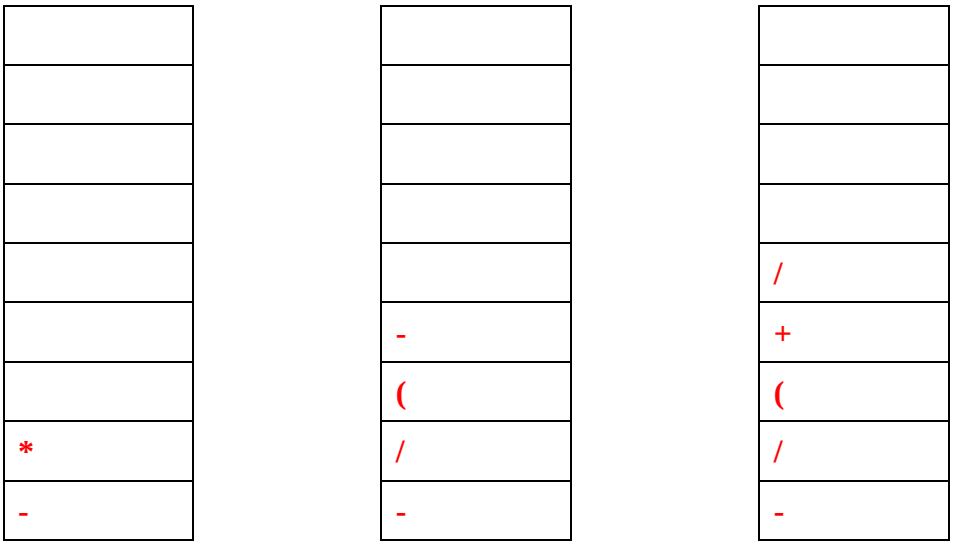
3) (10 pts) ALG (Stacks)

Convert the following infix expression to postfix using a stack. Show the contents of the stack at the indicated points (A, B, and C) in the infix expression.

```
              A                                   B                C
3 + 1 - 7 * (4 / 2 + 5) * 8 - 7 / (5 - 3 + (5 + 7) / (3 * 2))
```



A B C

Note: A indicates the location in the expression **AFTER** the multiplication and before the open parenthesis. B indicates the location in the expression **AFTER** the subtraction and before the value 3. C indicates the location in the expression **AFTER** the division and before the open parenthesis.

Resulting postfix expression:

3	**1**	**+**	**7**	**4**	**2**	**/**	**5**	**+**	*****	**8**	*****	**-**	**7**	**5**	**3**	**-**	**5**	**7**	**+**	**3**	**2**	*****	**/**	**+**	**/**	**-**

Note: There are exactly the correct number of boxes above. These should be filled with 14 numbers and 13 operators.

Grading: 2 pts for each stack, 4 pts for the total expression. Give partial as necessary.

Computer Science Foundation Exam

January 13, 2024

Section B

ADVANCED DATA STRUCTURES

NO books, notes, or calculators may be used,
and you must work entirely on your own.

SOLUTION

Question #	Max Pts	Category	Score
1	10	DSN	
2	10	ALG	
3	5	ALG	
TOTAL	25		

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and <u>not</u> graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all <u>be neat</u>. For each coding question, assume that all of the necessary includes (stdlib, stdio, math, string) for that particular question have been made.