

# CS152: Data Structure

## Week 7 Knowledge Check - Stack Applications

Write the full name of all collaborators inside this box

Discuss these questions and write your answers in the space provided below it.

1. Following the example given in the slides, evaluate by hand the following postfix expressions: Show your working in the table below each expression.

- a. 10 5 4 +\*
- b. 10 5 \* 6 -
- c. 22 2 4 \* /
- d. 33 6 + 3 4 / +

**a. 10 5 4 +\***

Step	Stack State	Operation / Explanation
1		
2		
3		
4		
5		
6		
7		

**b. 10 5 \* 6 -**

Step	Stack State	Operation / Explanation
1		
2		
3		
4		
5		
6		
7		

c. 22 2 4 \* /

Step	Stack State	Operation / Explanation
1		
2		
3		
4		
5		
6		
7		

d. 33 6 + 3 4 / +

Step	Stack State	Operation / Explanation
1		
2		
3		
4		
5		
6		
7		

2. What would be the complexity analysis for postfix evaluation?

3. Translate by hand the following infix expressions to postfix form: Show your working in the table below each expression.

- a. 33 - 2 15 \* 6
- b. 11 \* (6 + 2)
- c. 17 + 3 - 5
- d. 22 - 6 + 33 / 4

a. 33 - 2 15 \* 6

Step	Stack (Operators)	Output (Postfix)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Postfix:

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**b.  $11 * (6 + 2)$**

Step	Stack (Operators)	Output (Postfix)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

**Postfix:**

\_\_\_\_\_

**c.  $17 + 3 - 5$**

Step	Stack (Operators)	Output (Postfix)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

**Postfix:**

\_\_\_\_\_

**d.  $22 - 6 + 33 / 4$**

Step	Stack (Operators)	Output (Postfix)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

**Postfix:**

2. Perform a complexity analysis for a conversion of infix to postfix.