

# CMIS 350 - Project 1

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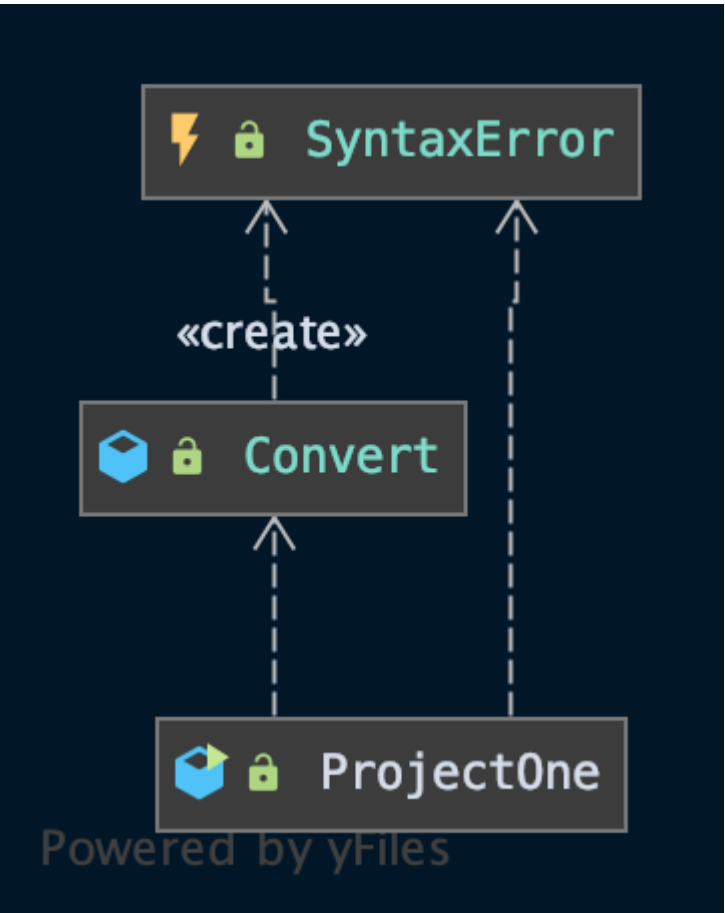
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**Description** A program that converts prefix expressions to postfix and postfix expressions to prefix. The program has three classes, including: ProjectOne.java, the main driver and the class in which the GUI object is created; Convert.java, the class that includes the methods for converting expressions as well as utility methods; and SyntaxError.java, a checked exception to be thrown by Convert.java methods and caught within ProjectOne.java

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## UML chart



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## Test cases

Test Case	Input	Expected Output	Actual Output	Pass?	Notes
1	* 2 + 2 - + 12 9 2	2 2 12 9 + 2 - + *	2 2 12 9 + 2 - + *	Yes	Testing prefix to postfix with example expression from instructions.

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Test Case	Input	Expected Output	Actual Output	Pass?	Notes
2	2 2 12 9 + 2 - + *	* 2 + 2 - + 12 9 2	* 2 + 2 - + 12 9 2	Yes	Testing postfix to prefix with the output of the previous example.
3	+ + A * B C D	A B C * + D +	A B C * + D +	Yes	Testing prefix with characters
4	1 2 3 4 5 6+-/*^	^ 1 * 2 / 3 - 4 + 5 6	^ 1 * 2 / 3 - 4 + 5 6	Yes	Testing all operators with no spaces between them.
5	1 + 1	error	JOptionPane warning against invalid syntax	Yes	Testing infixes(bad input). Without proper error-handling, this would try to call pop on an empty stack
6	(nothing)	error	JOptionPane asking for input	Yes	Without throwing an exception, simply pressing any of the buttons without input would add an empty string to the stack and eventually cause an EmptyStack exception
7	+ 2 * 2 2 2	2 2 2 * +	JOptionPane warning that operand stack is not empty	Yes	Case with result being a non-empty stack

## Lessons learned

First and foremost, I learned of prefix and postfix expressions, which admittedly took a minute to wrap my head around. Once I got a grasp on them, they made much more sense to use. Since they removed the need for operator precedence, associativity and even parenthesis, it seems like a much more straightforward input for computing. Next, I gained insight on an useful implementation of a stack. Previously, I knew of stacks, but not of many specific tasks that were primed for stacks use. Lastly, through working through the project, I got to work with the StreamTokenizer class. I found the interface to be slightly different at first, but once I dug onto the documentation, it was easy to learn. I weighed the pros and cons of StringTokenizer vs StreamTokenizer and in the end I liked the StreamTokenizer implementation better. I imagine I will use it many times in the future.