Munkhbayar Ganbold

Technical Manual

SpreadSheet project

1. Expression Tree

We built this class using provided starter code in the instruction. However, we have included ExpressTreeNode in ExpressionTree class as an inner class. A constructor of expression tree class builds an Expression Tree from given stack of tokens and 2D array of cells by passing the stack to buildExpressionTree method.

Its evaluate method gets called in Evaluator class to calculate integer value. Evaluate method calls recursiveEvaluate method to compute value of ExpressionTree. A recursiveEvaluate method recursively goes through each Treenode to calculate the value.

1. Evaluator

This class evaluates an expression tree from a string formula and calculates its integer value. First, it converts the string formula into a stack of tokens, and it initializes ExpressionTree which takes stack and 2D array of cells as parameters. I made use of getFormula method from util class which was provided in starter code, but I have modified a bit to deal with negative numbers. I created an if statement when character at current index is negative sign and its next element is digit, then we have a negative number. For non-single digit numbers, I used same algorithm that was used for getting positive numbers. I made a restriction for the user to use parenthesis around it whenever he/she enters a negative number.

At last, its calculate method computes an integer value of cell and its dependent cells by evaluate method from corresponding ExpressionTree class.

1. JUnit Testing for Topological sorting, Cyclic method and SpreadSheet class

I have created single JUnit Test class named SpreadSheetTest which initializes 5X5 spreadsheet with same values that were in the homework 6b instruction. It sets up each cell exact same position as homework 6b instruction sample sheet cells. Also, it tests if the topological sort works or not. In order to perform the topological sort, we call isCyclic from SpreadSheet class which detect a cycle and performs the topological sort for its cells.

I have intentionally created a small case where there is a cycle between two cells to test isCyclic method which detect the cycle for cells.