From: Jason
To: Jason^2
Subject: High Level Spreadsheet

With regards to the new spreadsheet project, we recommend building the project in Java 8 (version 1.8.0_131). The spreadsheet would be represented by a Cell class, an IFunction interface, an IFormula interface, and a ISpreadsheet interface.

At the highest level, there would be an ISpreadsheet interface with methods that all types of spreadsheets should have. Such as locating information in cells given a row and column number or applying a function to a row. In this representation of an ISpreadsheet, there would be a class called Spreadsheet that implements ISpreadsheet which has an ArrayList<ArrayList<Cell>> to represent the cells inside the Spreadsheet. It is represented with an ArrayList to account for the probability of an infinitely large spreadsheet.

At the next level, there would be an IFormula interface which represents the value of a cell. An IFormula can either be a reference to another Cell, an IFunction, or an integer value. All objects that implement the interface IForumla must be able to return a final value. For example, in a case where the Cell is a pointer to another cell that has an actual integer value, that cell will recursively call on the cell that it is pointing to to get the actual integer value.

The IFunction interface represents a function that you apply to two IFormulas. In this case, there would be two classes that implement IFunction, Add and Multiply. The interface has a method, apply(Cell cellOne, Cell cellTwo). The method ensures the classes that implement it must be able to either add or multiply the two values from the given cells. When the function is handed a cell that is represented by a cell that has a value of another cell. It will recursively call on the cell. If it is handed a cell represented by another function, it must solve the given functions before it solve its own, until it is given two integers that it can add or multiply. If the function is handed an integer, it would simply return the given integer.

The Cell class would represent the most basic unit in the spreadsheet. Each Cell would have an x and y value which represents the row and column coordinates in which its located. Additionally, a Cell would have an IFormula value field, that could either be an IFunction, another cell, or an integer.