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Design Document

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Classes:

1. Program
   1. Main Method
      1. Holds the Scanner
      2. Prints the spreadsheet
      3. Takes input
      4. Sends to spreadsheet
      5. Prints spreadsheet again with input
      6. Gives goodbye statement when user types quit
      7. Closes scanner when quit
2. Spreadsheet
   1. Spreadsheet Method – constructor
      1. Creates columns, rows and the Cell array
   2. Set
      1. When input is sent to it decides whether it’s a formula or other input and sends to the appropriate Set method in the Cell class.
   3. CharacterNum
      1. When given a character it will return the number for that character to set in the array. It finds the number for the column in the array.
   4. Parsing
      1. This parses the input by spaces and decides what the user is trying to do. Using a switch statement it looks at the first word and sees whether it’s something other than a cell address. So for example if it says clear then it will send to the correct method that deals with that instance. If it is a cell address it will go to the default and start looking at the input. If it’s just a value or a formula or if it has SUM or AVG after the “=” Then sending the correct info to the Set Method.
      2. The switch statement has:
         1. “clear”
         2. “width” – makes it so you can change the cell width
         3. “sorta”
         4. “sortd”
         5. “export”
         6. “import”
         7. “cell” – If you want to set the cell this way (doesn’t work with formulas though)
         8. The default – for setting with cell address first
   5. GettingCellInfo
      1. This when called will send back the info in the cell. Whether it’s a value, string or formula.
   6. validAddress
      1. This method checks whether the cell address sent to it is a correct cell address and returns either true or false.
   7. validInput
      1. This method checks whether the input is valid input and returns either true or false.
   8. validEquals
      1. This method checks whether they are actually using an “=” sign and returns either true or false.
   9. Clear
      1. When called this clear method (having no parameters) clears the entire sheet. If the user types in just “clear” this method is called.
   10. Clear – with parameters
       1. This method is when the person type in “clear <cell address>”. It has the parameters of the column and the row (character and integer). When called it only clears that one cell address.
   11. RowSep
       1. This method gives the “-“dashes to add to the spreadsheet. It looks at the cell width and loops through enough to line across the spreadsheet.
   12. PrintSpreadsheet
       1. This is my method to print the spreadsheet.
       2. It first prints the row of letters across the top then goes down and prints each row. Its starts with the number then moves out. It has a certain format for each cell then for when a cell has something inside. This is called from the Cell Class because it depends on the type of input wanted in the cell and the format for that type of input.
3. Cell
   1. Cell Method – Constructor
      1. This method is called to set any type of input besides formulas into cells. It calls the Set method.
   2. Cell Method – Second Constructor for formulas
      1. This method is called to set formula types into cells. It calls the Set formulas method.
   3. Set
      1. This method is called when the input in not a formula. It will look at the input and decide whether it is a value (double) type, a date type or a String type and then sets the right input to the correct variables.
   4. formulaSet
      1. This is just like Set but it sets two variables one for the actual evaluated number and one for the original formula. It calls the formula class to get the evaluated number and then also saves the formula to print when called.
   5. toString – with parameters
      1. This method sets the different formats for each cell depending on the type of input. Makes it so it can be converted from a string to a double if needed. Also has if the input is longer than the cell width then it adds a “>” at the appropriate spot.
   6. toString
      1. This is the method that will be called when wanting to print out the cell when they want the info. Decides what type and if it is a formula type then it instead prints the formula and not the evaluated number.
4. Formula
   1. CheckingFormula
      1. Checks whether it is a cell to see if the user wants to operate with a cell or an integer.
      2. This method just looks at the first character and checks if it’s a letter or not and if not then it is an integer.
   2. ParsingNumFormula
      1. This is the bigger method that has a for loop that runs through the parsed out formula. It take the first two number checks if it’s a cell then operates them then takes that number and runs through the rest of the formula until there is no more input to be operated
   3. Adding
      1. This method is called when wanting to add numbers together
   4. Subtracting
      1. This method is called when wanting to subtract numbers together
   5. Multiplying
      1. This method is called when wanting to multiply numbers together
   6. Dividing
      1. This method is called when wanting to divide numbers together
   7. SUM
      1. This method is called when the user types a cell address equals SUM then a cell range. It loops through the cell range and adds up all the numbers in the cell range.
   8. AVG
      1. This method takes the SUM and divides it by the number of cells in the range to get the average and returns that number.
5. Importing-Exporting
   1. Import – importing files
      1. This method is called when wanting to import an already exported file. It takes the file and looks at each number (column, row and then the input) and if the input is longer than one (like a formula) it take the formula and makes it a value.
   2. Export – Exporting files
      1. This method saves the table into a text file.
6. Sorting
   1. sortA
      1. This method when called will sort the cell range in ascending order. This is a bubble sort where it runs through ever value and switched it then checks again and then switched it until it has gone through the whole cell range.
   2. sortD
      1. This method is exactly the same as sorta except it is going in the opposite direction.