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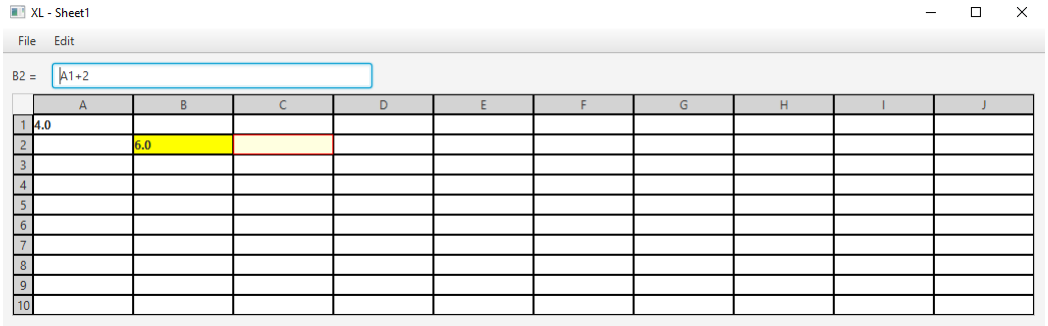
The XL Reference Manual, Revision 7

Introduction

The XL[1] program provides an interactive spreadsheet. The program contains five main components: a manu bar, the current cell editor, and the sheet area. The menu bar has two drop-down menus: "File" and "Edit". The current cell editor is used for editing the equation of the currently selected cell. The sheet area visualizes the current contents of all of the cells in the spreadsheet.



The sheet area

The sheet area is a matrix of cells, with columns ranging from A to J and rows from 1 to 10. The left border of the sheet area shows the row numbers and the top border shows the column letters. Each cell can be empty or store an expression or a comment. If a cell contains an expression the computed value of that expression is displayed. If it contains a comment the text is displayed. Each cell has an address constructed by the column and row indices. The address of the top left cell is `A1` or equivalently `a1`. The bottom right cell is named `J10` or `j10`.

The user may construct arithmetic expressions using other cell values by reference. An example: If the numbers 2 and 3 are entered into the `b1` and `b2` and the expression *b1*b2* is entered into `b3` then the text displayed in `b3` will be "6.0". The value of an expression is automatically updated if the referenced cell values change. For example, if the value in cell `b2` were changed to 4, the new value of `b3` would become "8.0".

The value of an expression cell is a floating point number. An expression is built of constants, cell addresses, additions, subtractions, multiplications, and divisions. Parentheses may be used to change the order of computation in the usual way. These expressions are entered by the user and may be changed at any time.

An expression cell must not refer to an empty cell or a comment cell. An expression cell must not refer to itself directly nor indirectly. E.g. you must not store the expression `a1+1` in cell `a1` and you must not store the expression `b2` in cell `b1` and the expression `b1` in cell `b2`. In such cases the program will report an error in the status area and leave the contents of the sheet unchanged.

It is not possible to enter an expression so that a division by 0 occurs anywhere in the sheet area.

There is always one cell in the sheet area that is considered to be the *current cell*. This cell is marked with a yellow background and its address is displayed in the current cell indicator. Clicking on a cell in the sheet area will make it the current cell.

The contents of the current cell will be displayed in editor when a new current cell is selected. If the cell contains an expression then this expression is displayed.

[1] This programming exercise is adapted from "Liskov, Guttag: Abstraction and Specification in Program Development".

The editor

The editor is used to enter an expression or a comment into the current cell. Anything starting with a # character is considered to be a comment. The # character is not part of the comment and is not shown in the sheet area.

If the editor is not empty and the return key is pressed its contents is put into the current cell.

Errors in expressions, such as circular references or references to blank cells, are show directly in the cell in the sheet area. The full error message will not fit in a cell so to see the full error message the user may place the mouse cursor over the cell and a tooltip will appear displaying the full error message.

The menu bar

The menu bar has two drop-down menus. The **File** menu has tree alternatives:

Save A file dialog opens and the contents of the current spreadsheet may be saved.

Open A file dialog opens and the contents of the current spreadsheet may be replaced by the file contents.

Exit The current XL window is closed and all information contained i the spreadsheet is lost. Closing the the last window will terminate the program.

The **Edit** menu has two alternatives: one for making the current cell empty and one for clearing all cells.