



- ▶ Graphical User Interface
- ▶ Powerful Grid Object

Introduction

APL is fundamentally an array processing language and most APL applications deal with large quantities of tabular data. What then could be more convenient than a built-in spreadsheet object for displaying and editing these tables?

The Grid object is a special purpose spreadsheet control designed to meet this requirement. Unlike third-party spreadsheet controls (which you can also use if you wish) it is designed specifically for APL usage. The Grid will handle enormous arrays up to the memory capacity of your computer, and is extremely fast and responsive to use.

Examples

Surname	Job Title	Region	Salary	Perm
Brown	Manager	South	£64000.00	<input checked="" type="checkbox"/>
Jones	Project Leader	South	£43250.00	<input checked="" type="checkbox"/>
Green	Consultant	South	£45000.00	<input type="checkbox"/>
Black	Programmer	East	£30000.00	<input checked="" type="checkbox"/>
White	Assistant	Central	£40000.00	<input type="checkbox"/>

		Sales Target %					
		Champagne		Wine			Beer and Cider
		White	Pink	Red	White	Rose	
North	Jan	77	50	15	55	84	44
	Feb	2	69	76	86	40	55
	Mar	70	62	67	109	55	41
South	Jan	43	24	100	61	104	62
	Feb	79	36	59	55	20	74
	Mar	13	30	82	68	82	5
East	Jan	34	99	21	68	60	40
	Feb	9	70	15	35	84	98
	Mar	83	100	37	87	47	29
West	Jan	113	98	75	33	63	113
	Feb	8	115	37	25	79	53
	Mar	82	50	98	9	105	72

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Specifying Your Data

Specifying the data for a Grid is simplicity itself. The *Values* property is a matrix whose elements correspond to cells. Each element or cell may be a number, a character vector or a character matrix. If you have a large sparse matrix, you can use the Boolean *CellSet* property to identify empty cells for maximum efficiency. The *CellTypes* property specifies, for each cell, an index into lists of other properties which describe fonts, colours and so forth. This design combines maximum flexibility with an efficient use of memory.

Row and Column Titles

Column and row headings are specified by the *ColTitles* and *Row Titles* properties. Titles can be simple or multilevel (useful for displaying a slice of a multidimensional data structure) and the latter may be regular or irregular in structure. Other properties control title height, width, colour and alignment.

Editing data in a Grid

Input is performed by associating other objects such as Label, Edit, Button or Combo objects, with cells of the Grid. Edit and Label objects support various data types including character, numeric, currency, date (long and short formats) and time. Combo objects give your user a simple way to choose from a number of options and eliminates the need for validation. Check Buttons provide a simple way to enter Boolean (yes/no) values into the Grid. You can use a single associated object for every cell, or you can use different objects for different cells. Objects may be external or internal to the Grid to provide "in-cell" editing.

Additional Formatting

The *FormatString* property defines format specifications by which cells are to be formatted. This property applies both to the Grid itself and to individual Edit and Label objects associated with particular cells, thus affording a great deal of flexibility.

The *AlignChar* property allows you to specify how individual columns of data are aligned; for example, you can align columns on a decimal point.

Locking

The *LockRows* and *LockColumns* methods allow you to lock individual rows and or columns in a Grid. These remain in a fixed position in the Grid while other rows and columns scroll around them. One use is to fix row and column totals.

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Gridlines

The *GridLineFCol* and *GridLineWidth* properties specify sets of colours and line widths for the grid lines in a Grid object. The colours and widths from these property sets are mapped to individual grid lines through the *RowLineTypes* and *ColLineTypes* properties.

Graphics

A Grid may be embellished by creating graphical objects as its children. These include lines, rectangles, circles, ellipses, text and pictures (bitmaps, icons and metafiles).

In addition to proportional, pixel and user co-ordinates, graphical objects may be drawn using cell co-ordinates so that they can be positioned relative to the Grid data even when variable size rows and columns are in operation.

Comments

The Grid object supports comments in a manner that is consistent with the way that comments are handled in the latest edition of Microsoft Excel.

If a comment is associated with a cell, a small red triangle is displayed in its top right corner. When the user rests the mouse pointer over a commented cell, the comment is displayed as a pop-up with an arrow pointing back to the cell to which it refers. The comment disappears when the mouse pointer is moved away. This is referred to as *tip* behaviour.

	A	B	C
1	14	76	46
2	52	84	4
3	69		
4	77		
5	99		
6	48		
7	51	52	32
8	39	28	92
9	13	2	69

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It is also possible to display and hide comments under program control. A comment window displayed under program control does not (normally) disappear automatically when the user moves the mouse, but instead must be hidden explicitly. It is therefore possible to have several comments visible.

Other Features

In addition to these powerful data entry and formatting capabilities, the Grid supports drag-drop editing, copy and paste to and from the clipboard, resizable columns and rows, an undo buffer and a host of other useful features.

Suitable for a Wide range of Applications

With so much flexibility, the Grid can be used for all types of data entry and display applications and will greatly enhance the appearance and usability of your systems.

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