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Introduction to Spreadsheets

This introduction to spreadsheets consists of four parts.

1. Basic Commands
2. Other Commands
3. Commands for cell entries
4. Applications

Basic Commands explores spreadsheet file handling and spreadsheet editing commands. These include copy and paste and inserting or deleting rows and columns.

Other Commands only get a brief mention in this edition as they refer to more advanced options such as graphing data and performing statistical operations on rows or columns.

Commands for cell entries become available when editing cell contents. They include the inbuilt Cell functions such as CellSum and CellMax which operate on a range of cells.

Applications puts all the above ideas into practice with a couple of step by step spreadsheets which explore some number patterns and relationships.

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1. Basic Commands

These are all available when the cursor is in a single cell. When a row or column is selected, only the commands marked * are available.

File handling.

FILE	NEW	Creates a new spreadsheet. No need to save existing spreadsheet first since they are automatically saved as you work.
	OPEN	Open an existing spreadsheet.
	SV.AS	Save a copy of the current spreadsheet under a different name.
	RECAL	When Auto Calc is Off in the SetUp this command recalculates the whole spreadsheet.

Spreadsheet editing.

EDIT*	CUT*	Cuts the contents of the current Cell / Selection ready to Paste into another location.
	COPY*	Copies the contents of the current Cell / Selection ready to Paste into another location.
	PASTE*	Only available after either Cut or Copy has been used. Move to desired location and Paste. When used after Copy, can be used multiple times to repeatedly Paste into many locations. After Copy/Paste has been used, tap the EXIT key to return to normal operation.
	CELL*	Use to edit the contents of the Current Cell.

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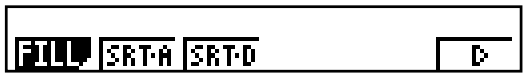
Selecting a range of cells.

To select a range of cells, for example from Cell A2 to D4

1. Move to the first cell, A2
2. Tap the keys SHIFT, 8 (CLIP)
3. Move to the last cell, D4. (Cells will become highlighted)

Now the range is selected and ready to be cut or copied using the edit keys as above. To unselect, tap the EXIT key once or twice.

JUMP	This command enables you to jump to a particular cell (GO) or to the Top Left, Top Right, Bottom Left or Bottom Right cell of the spreadsheet.
SEQ	This enables a number sequence to be generated in a column. For example, the following settings would create the sequence 16, 25, 36, 49 in column B starting in cell B3. Expr: X^2 Var: X Start: 4 End: 7 Incre: 1 1st Cell: B3



FILL	Fill enables a range of cells to be filled with a formula. For example, let cells A1 to A4 contain the numbers 1, 2, 3 and 4. Using Fill with the entries shown below would paste the formulas $=A1^2$, $=A2^2$, $=A3^2$ and $=A4^2$ into cells B1 to B4. Formula: $=A1^2$ Cell Range: B1:B4 Thus cells B1 to B4 would display 1, 4, 9 and 16. Note how the pasted formulas are updated to reflect the relative positions of the first cell in the range (B1) to the cell in the formula (A1).

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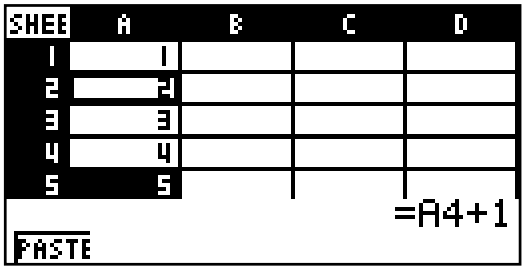
SRT.A*	Sorts the current selection of cells in ascending order.
SRT.D*	Sorts the current selection of cells in descending order.

1A. How big can a spreadsheet be?

Use JUMP to find out how many columns and rows can be used in a Casio spreadsheet.

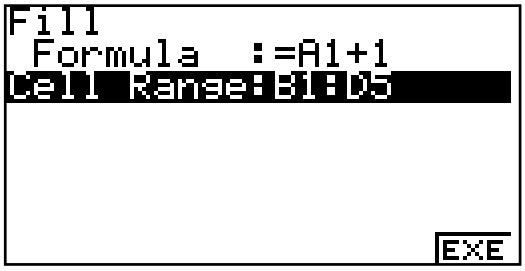
1B. Copying the formula from a single cell...

Type the number 1 into cell A1.
In cell A2 and type the formula =A1+1.
Move back to cell A2 and copy cell (EDIT, COPY).
Move to cell A3 and paste, then to A4 and A5.
Tap the EXIT key (to clear the selected cell A2).



1C. Filling a range of cells...

Move to cell B1.
Tap the keys SHIFT, 8 (CLIP).
Move the cursor down to cell B5 and then right to cell D5.
Choose the FILL command. (Note Cell Range).
Enter the formula =A1+1, followed by EXE.
Tap the EXIT key a few times to release the selection.



Note how the cells have been filled. Since B1 was the top left cell of the selection, and the formula we entered referred to cell A1, every cell has been referenced to the cell one to its left.

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Basic Commands continued...

DEL*	ROW	Deletes the entire current row. Use with caution as there is no confirming option!
	COL	Deletes the entire current column. Use with caution as there is no confirming option!
	ALL	Deletes the whole sheet. This command does require confirmation.

INS*	ROW	Inserts a blank row at the current cursor position. Pushes the rest of the spreadsheet down.
	COL	Inserts a blank column at the current cursor position. Pushes the rest of the spreadsheet right.

CLR*		Clears the contents of all cells in the current selection.

1D. Inserting, deleting and clearing...

Move to cell C3 and insert a column.
Delete the column you just inserted.
Select all of column D (move to top of column D) and delete.
Select all of row 5 (move to left of row 5) and delete.
Select the whole of row 2 and clear all contents.
Finally, delete the whole sheet!

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2. Other Commands

Other Commands only get a brief mention in this edition as they refer to more advanced options such as graphing data and performing statistical operations on rows or columns.

GRPH*	Graph Options
CALC*	Statistical Calculations
STO	Store selection as Variable, List, List File or Matrix.
RCL	Recall List, List File or Matrix.

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3. Commands for cell entries

These become available when entering or editing cell contents. Cells will typically contain text, a number or a formula.

TEXT
To enter text use SHIFT + ALPHA to lock in text entry followed by opening quotes '' (tap the EXP key). Whatever text is entered will flow across adjacent cells to the right unless those cells contain an entry.

NUMBER
Numbers can be entered individually or as an expression. For example, the entry 10×2+1 will display as 21.

FORMULA
To enter a formula, first tap SHIFT + • (the decimal point). This will enter the equal sign =, which must precede any formula.

As soon as one of the above types of cell entry begins, the menu at the bottom of the screen changes to show the following additional commands.

GRAB	Use GRAB to GO to a cell and SET its cell reference.
$	The dollar symbol is used for absolute cell references. This means that when a formula is copied from one cell to another any, any absolute reference is not changed. A typical formula might look like =C5×A1.
:	This is the cell range separator used with most of the Cell functions, etc. A typical formula might look like =CellSum(A1:B10). This formula will find the sum of the contents of all cells between A1 and B10.

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If — CellIf (Expression, IfTrue, IfFalse)

The CellIf command has three parts: Expression, IfTrue and IfFalse.

For example, suppose we want to calculate the value of B1-A1. If the difference is positive, we will display the difference. If not, we will simply display 0. So our formula will look like:

The expression part checks to see if A1 is less than or equal to B1. If this is true then the value of B1-A1 is displayed. Otherwise 0 is displayed.

CEL — Cell functions which act on given range of cells

There are six cell functions:

Min	Finds the minimum value of all cells in the range. =CellMin(A1:A10)
Max	Finds the maximum value of all cells in the range. =CellMax(B1:C10)
Mean	Finds the mean of all cells in the range. =CellMean(C1:C10)
Med	Finds the median of all cells in the range. =CellMedian(B1:B120)
Sum	Finds the sum of all cells in the range. =CellSum(A1:C20)
Prod	Finds the product of all cells in the range. =CellProd(D2:D3)

REL — Use with CellIf when creating expressions

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4. Applications

4A. Sum of consecutive odd numbers: 1 + 3 + 5 + ... + n

This spreadsheet investigates the sum of the first n odd numbers.

a. Step 1 starts a new spreadsheet.
b. Steps 2 and 3 create a list of the first 10 odd numbers in cells A2 to A11.
c. Steps 4 to 8 create the sum of the numbers in cells B2 to B11.
d. Steps 9 and 10 create a list of square numbers in cells C2 to C11 for comparison.

Step	Cell	Entry / Action	Note
1		File, New	Enter name such as ODD
2	A1	"ODD	Just opening speech mark needed when entering text in a cell.
3	A2	SEQ	2X-1 X 1 10 1
4	B1	"SUM	
5	B2	=CellSum(A$2:A2	Use of $ prefix to create absolute reference rather than relative reference. Also note that closing bracket is optional with most functions.
6	B2	COPY	
7	B3	PASTE	Repeat this step 9 times, moving down a cell each time until B11 is reached.
8		EXIT	Release selection
9	C1	"SQ	
10	C2	SEQ	X^2 X 1 10 1

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4B. Sum of squares of consecutive pairs of Fibonacci numbers: $1^2 + 1^2$, $1^2 + 2^2$, $2^2 + 3^2$, $3^2 + 5^2$,

This spreadsheet investigates the sum of the squares of consecutive pairs of Fibonacci numbers.

a. Step 1 starts a new spreadsheet.
b. Steps 2 to 5 create the first 50 terms of the Fibonacci Sequence in cells A2 to A51. (Why the first 50? See below!)
c. Steps 6 and 7 create the sum of the squares of consecutive terms in cells B3 to B51.

Step	Cell	Entry / Action	Note
1		File, New	Enter name such as FIB
2	A1	"FIB	Just opening speech mark needed when entering text in a cell.
3	A2	1	First term of sequence.
4	A3	1	Second term of sequence.
5	A4	FILL	Formula: =A2+A3 Cell Range: A4:A51
6	B1	"SUM	
7	B3	FILL	Formula: $=A2^2+A3^2$ Cell Range: B3:B51

Now JUMP to cell A30.

Notice that in cell A32 the number is too big to be displayed in its entirety and has been shown using standard form: 1.34E6. In the bottom right corner of the screen is the cell formula =A28+A29.

So that the 31st Fibonacci number can be seen, we can modify the default spreadsheet SetUp. Tap the keys SHIFT + MENU (SetUp), highlight Show Cell and tap F2 (Val) so that the cell value will now be displayed instead of the formula. Tap EXIT to return to the spreadsheet.

The 31st Fibonacci number can now be seen in the lower right corner of the screen and is 1346269.

Q. What is the largest Fibonacci number that the spreadsheet can display exactly?

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