

VisiCalc® Quick Reference Guide

For Use With the HP-75

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1000 N.E. Circle Blvd., Corvallis, OR 97330, U.S.A.

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Entering VisiCalc®

To enter the VisiCalc program, make sure you are in HP-75 EDIT mode (the display shows >■ or :■), type `vc` in upper- or lower-case letters, then press **RTN**. VisiCalc will then display one of the following messages:

Enter worksheet name: BUDGET

VisiCalc displays the most recently accessed worksheet in memory, or ...

Enter worksheet name: ■

This template is displayed when no worksheets exist in memory.

Your options at this point are:

- Recall the displayed worksheet file by simply pressing **[RTN]**.
- Enter a new worksheet file name by typing the file name in the blank space or over the existing name. When you press **[RTN]**, a new empty worksheet will be created.
- Display the file names of other VisiCalc worksheets in memory by pressing the **[↑]** key. (Use the **[↑]** key to scroll back through the worksheet catalog after pressing **[↓]**, or use **[SHIFT][↑]** or **[SHIFT][↓]** to display the first or last entries in the worksheet catalog.)
- Exit the VisiCalc program and return to EDIT mode by pressing the **[ATTN]** key.

Top Level Operations

Viewing the Worksheet

[↑], **[↓]**,
[←], **[→]**

Moves the cell display one cell up, down, left, and right, respectively.

[SHIFT][↑],
[SHIFT][↓],
[SHIFT][←],
[SHIFT][→]

Moves the cell display to the top and left physical boundaries, and to the bottom and right active boundaries of the worksheet, respectively.

[SHIFT][>]

Initiates the Go To command.

[SHIFT][EDIT]

Toggles the display between the current cell and the worksheet status line.

[FET]

Toggles the display between the current cell and the window access cell of the alternate viewing window.

[SHIFT][FET]

Defines the alternate window access cell.

[I]

Recalculates the entire worksheet.

Viewing the Cell Contents

[RUN]

Moves the cell contents of the cell display one character position to the left.

[SHIFT][RUN]

Moves the cell contents of the cell display one character position to the right.

[TAB]

Moves the cell contents of the cell display one window width to the left.

[SHIFT][TAB]

Moves the cell contents of the cell display one window width to the right.

Controlling the Display Format

[TIME]

Toggles the cell coordinates field of the cell display between User-Defined and Default Coordinate Display modes. This toggle setting is stored with the worksheet.

[SHIFT][TIME]

Toggles the cell contents field of the cell display between User-Defined and Default Coordinate Display modes. This toggle setting is stored with the worksheet.

[APPT]

Toggles the worksheet between Formula and Result Display modes. This toggle setting is stored with the worksheet.

[SHIFT] [APPT]

Toggles the cell display between Formatted and Unformatted Display modes. This toggle setting is stored with the worksheet.

Switching Levels

[@], [+], [-]

[.], [I], [I.]

or digit

Switches VisiCalc to Edit level, ready for a value entry.

[', ["], [^], [#]

[\$], [%], [&]

letter, or space

Switches VisiCalc to Edit level, ready for a label entry.

[EDIT]

Switches VisiCalc to Edit level, ready to change the current cell contents.

[CLR]

Clears the contents of the current cell and switches VisiCalc to Edit level, ready for a new entry of the same type as the just cleared entry.

[/]

Switches VisiCalc to Command level.

[ATTN]

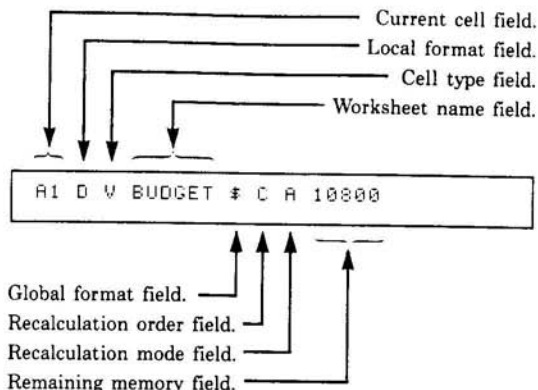
Returns to Top level.

[SHIFT] [ATTN]

Exits VisiCalc.

The Status Line

The status line is a single line display of certain information about the current cell and the active worksheet. To access the status line, press **[SHIFT] [EDIT]**. To return to Top level, press **[ATTN]** or **[SHIFT] [EDIT]**. The various fields in the display are (from left to right):



Edit Level Operations

Label Entries

Label entries start with a letter (A-Z, a-z), a single or double quote character (' or "), ^, #, \$, %, &, or the space bar. Terminate a label entry by pressing **[RTN]**. Correct errors by using the HP-75's editing keys. A label entry can contain up to 95 characters.

Value Entries

A value entry can be a number, or an expression that can consist of any combination of numbers, coordinates of other cells (cell references), functions (such as SUM or LOG), arithmetic operators (+, -, *, /, ^, MOD, DIV), logical and relational operators, and/or parentheses. You must start a value entry with a +, a digit (0-9), or one of the symbols @, -, decimal point (.), <, or >. You terminate an expression by pressing **[RTN]**. Errors can be corrected by using the HP-75's editing keys. A value entry

that was inadvertently entered as a label (by beginning it with a label character), can be converted to a value entry by using the editing keys to place an @ character at the beginning of the entry.

Examples:

12.34

A normal number.

.1234E2

A number in scientific notation.

2+2

An arithmetic expression.

B4

A cell reference.

2*B4

An expression with a cell reference.

2*(3+4)

An expression with parentheses.

SUM(A1...A10)

A function call with a range.

A5:SALES

An external cell reference.

If you press **[]** while entering an expression, VisiCalc calculates the value of the expression and places the number that is the result of the calculation in the display. If you do this, the expression will be over-written by the result and cannot be recovered if **[RTN]** is pressed. A value entry can contain up to 91 characters.

Cell References

A cell reference consists of the coordinates of a cell entered in the current cell. Cell references are allowed in expressions wherever numbers are allowed. A cell reference is made by typing the coordinates of the desired cell (using user-defined headers, default headers, or a combination of the two). If a cell entry begins with a cell reference and default coordinates are used, the entry must be preceded by a + or @ character. User-defined cell coordinates must be enclosed in brackets.

Examples:

A1

Default coordinates.

[Jan^Income]

User-defined coordinates.

[Jan]1 or A[Income]

Mixed coordinates.

Ranges and Parameter Lists

A range is any number of entries in adjacent columns or rows. A range is specified by keying in the coordinates of the first entry followed by an ellipsis (...), then the coordinates of the last entry.

Examples:

A1...L1

Range with default coordinates.

[Jan^Income]...[Dec^Income]

Range with user-defined coordinates.

A parameter list is a series of parameters separated by commas. A parameter can be a single cell reference, a range of cell references, a number, or an expression.

Examples:

A1...L1

A list consisting of a single range.

C1...C7,C9...C12

A list consisting of two separate ranges.

[Jan^Income],A3...A7

A list consisting of a single cell reference and a range.

Function Calls

Function calls consist of the function name followed by a parameter list. (A complete list of the available HP-75 functions and the functions built into VisiCalc is given under the heading "Functions.") If a cell entry begins with a function name it must be preceded by a + or @.

Examples:

LOG(A2)

An HP-75 function call.

MINL(A1...L1)

A VisiCalc function call.

External Cell References

External cell references consist of expressions that contain cell coordinates, followed by a colon and the file name of the referenced worksheet. The referenced worksheet must reside in memory when the external cell reference is entered in a formula. The external cell can be referenced using user-defined coordinates, default coordinates, or a combination of the two.

Examples:

B7:JANBUDGT

A reference to a single cell in worksheet JANBUDGT.

M3*M6:SALES2

An expression containing a cell (M6) in another worksheet (SALES2).

SUM(B6...K6:SALES2)

A function call with a range of cells from worksheet SALES2.

Edit Level Keys

ATTN

Cancels the current cell entry, restores the previous entry, and returns to Top level.

SHIFT ATTN

Exits VisiCalc.

TIME

Toggles the cell coordinates field of the cell display between User-Defined and Default Coordinate Display modes. This toggle setting is stored with the worksheet.

→

Moves the edit cursor one character position to the right.

←

Moves the edit cursor one character position to the left.

SHIFT →

Moves the edit cursor one position past the last character position of the current entry.

SHIFT ←

Moves the edit cursor to the first character position of the current entry.

CTL →

Right-shifts the edit cursor one window width or to the end of the cell contents field, whichever distance is shorter.

CTL ←

Left-shifts the edit cursor one window width or to the beginning of the cell contents field, whichever distance is shorter.

I/R

Exchanges the replace cursor (■) with the insert cursor (♦). Characters that are entered after this keystroke will be inserted to the left of the cursor.

SHIFT I/R

Causes the next keystroke or keystroke combination to display the character associated with it, regardless of key redefinitions.

DEL

Deletes the character under the cursor and moves the remaining characters to the left.

SHIFT DEL

Deletes the character indicated by the cursor and all characters to the right of the cursor.

CLR

Clears the cell contents field.

I

Evaluates a formula, during value entry or editing, before it is stored in a cell. The formula will be over-written by the result if **RTN** is pressed.

BACK

Replaces the character to the left of the edit cursor with a blank, then moves the cursor one position to the left. In insert mode, the characters at and to the right of the cursor are moved one position to the left.

RTN

Stores the cell entry and returns to Top level.

Command Level Operations

Command level is entered by pressing the slash (**/**) key. VisiCalc then prompts:

Command: **DEGHIJKLMNOP**

/D Delete.

/DC Deletes the column in which the cell display lies. It must be followed by **Y** to delete or by **N** to cancel the deletion.

/DR Deletes the row in which the cell display lies. It must be followed by **Y** to delete or by **N** to cancel the deletion.

/F Format. Sets the display format of a single cell entry to one of the following:

/FD Local Default to Global format. Causes the cell entry to default to the current global format.

/FG Local General format. Values are right-justified with as many digits displayed as possible. Labels are left-justified.

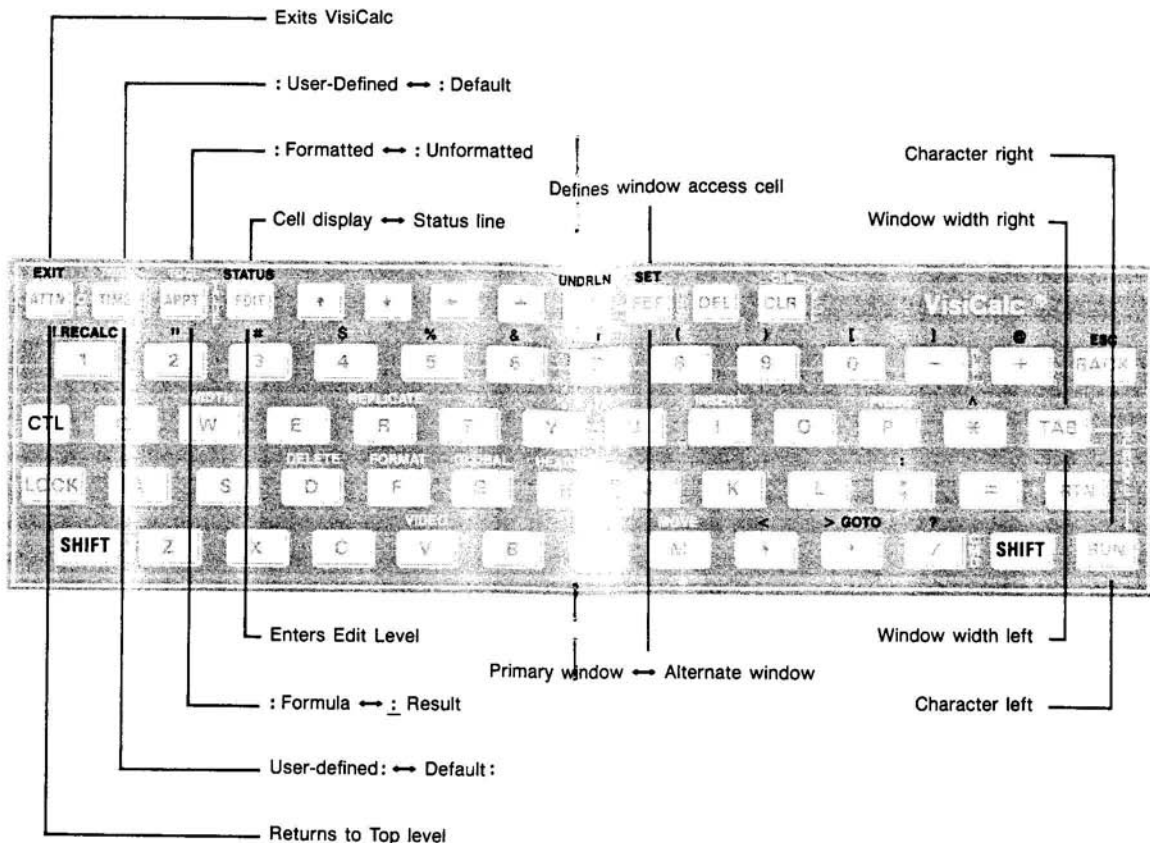
/FI Local Integer format. Values are rounded to an integer and are right-justified without a decimal point. This command alters the format of the cell display in the HP-75's display window in Formatted Display mode.

/FL Local Left-Justified format. Causes value or label entries to be left-justified within the cell display.

/FR Local Right-Justified format. Causes value or label entries to be right-justified within the cell display.

/F\$ Local Dollars format. Values are rounded to two decimal places and are right-justified. This command alters the format of the cell display in the HP-75's display window in Formatted Display mode.

Continued on page 14.



Unshifted Keys

- /F* Local graphing format. Converts cell values to asterisks.
- /G Global. Sets global status of the worksheet:
- /GC Sets the column width of the entire worksheet to any width from 0 to 255 characters.
- /GO Global recalculation order.
- /GOC Sets the recalculation order to be column-by-column, beginning with column A.
- /GOR Sets the recalculation order to be row-by-row, beginning with row 1.
- /GR Recalculation mode.
- /GRA Sets Automatic Recalculation mode.
- /GRM Sets Manual Recalculation mode.
- The entire worksheet is recalculated whenever you press the ☐ key while VisiCalc is at Top level.
- /GF Sets the format of all cells in the worksheet except those that have had a local format set with the /F command. The available global formats are the same as those available to the local Format command (GILR\$*) except that there isn't a Default format.
- /H Header.
- /HC Displays the column header prompt, so that user-defined column headers can be set.
- /HR Displays the row header prompt, so that user-defined row headers can be set.
- /HW Sets the width of the row header column.
- /HS Allows default headers to be suppressed in printed listings and in a video display. A ☐ response suppresses default headers; a ☐ response restores the display or printing of default headers.

- /I Insert.
 - /IC Inserts a column to the left of the column in which the cell display lies.
 - /IR Inserts a row just above the row in which the cell display lies.
 - /M Move.
 - /MC Moves the column in which the cell display lies to the position currently occupied by the specified destination column.
 - /MR Moves the row in which the cell display lies to the position currently occupied by the specified destination row.
- When moving a column (or row), all columns (or rows) between the source and the destination, including the destination, will move one position toward the source, and the source will be placed in the destination's previous location.
- /P Print. Allows you to print worksheets and worksheet formulas. The Print command procedure is as follows:
 1. Select the print option:
 - /PW Prints the worksheet without column and row headers.
 - /PH Prints the worksheet with column and row headers.
 - /PF Prints a list of the formulas used in the worksheet.
 2. After you select the type of printout, VisiCalc prompts for the boundaries of the worksheet area to be printed:

Prompt: Upper left: cell coordinates
 3. Press ☐ to use the default boundary or (for a different boundary) press ☐, enter the new coordinates, then press ☐:

Prompt: Lower right: cell coordinates

4. Press **[RTN]** to use the default boundary or (for a different boundary) press **[CLR]**, enter the new coordinates, then press **[RTN]**. After you specify the print boundaries, VisiCalc prompts for an optional printer setup string:

Prompt:

Printer setup: current printer setup string

5. Enter any combination of escape sequences, control codes, and printable characters (up to 95 characters), then press **[RTN]**. After you specify a setup string, VisiCalc prompts for the printer width:

Prompt:

Printer width: current HP-75 PWIDTH setting

6. Press **[RTN]** to use the current PWIDTH setting or (to enter a new printer width) press **[CLR]**, enter the new width, then press **[RTN]**. VisiCalc will respond with the *Working* message and will begin to print the worksheet (or formulas). The *Working* message will be displayed until the printout is complete.

If you attempt to execute the Print command without a correctly connected and assigned printer on the loop, the HP-75 will beep and VisiCalc will remain at the command prompt line.

/R Replicate. Allows you to replicate a cell across a column or row, or to replicate an entire column or row. The replication procedure is as follows:

1. Position the cell display on the first cell of the source range (the first cell to be replicated) and type **[Z] [R]**.

Prompt: Repl source: current cell ■

- To use the displayed cell as the entire source range, press **[RTN]**.
- To specify a range of cells (beginning with the current cell) as the source range, enter an ellipsis, then the coordinates of another cell, followed by **[RTN]**.

• To specify a range of cells that begin with a different cell than the current cell, press **[CLR]**, enter a source range beginning with a cell different than the one displayed, then press **[RTN]**.

2. After you enter the source range, VisiCalc prompts for the target range.

Prompt: Repl target: ■

3. Enter the target range and press **[RTN]**. Before pressing **[RTN]**, you can review the source range by pressing **[↑]**; press **[←]** to return to the target range prompt. If the cell or cells being replicated contain cell references, VisiCalc will prompt for the type of replication.

Prompt: Repl: No change Relative Both

- [N]** Replicates the source range into the target range with exactly the same cell references as those in the source range cells.
- [R]** Replicates the source range into the target range with all relative cell references.
- [B]** Allows you to specify No change or Relative for every cell reference in the source range.

Prompt:

source range coordinates: cell reference ←No Rel

For each cell in the source range (source range coordinates) that contains a cell reference, each cell reference in that cell's entry will be displayed in turn (cell reference) with the ←No Rel prompt.

- [N]** Causes that particular cell reference to be replicated with no changes.
- [R]** Causes that particular cell reference to be replicated as a relative reference.

- /V** Video.
- /VY** Clears the video display and activates it if it is off.
- /VN** Deactivates the video display if it is active.
- If you attempt to execute the Video command without a correctly connected and assigned video display on the loop, the HP-75 will beep and VisiCalc will remain at the command prompt line.
- /W** Width. Sets the column width of the column in which the cell display lies to any width from 0 to 255 characters.
- /-** Repeating labels. Any entry is treated as a label and when viewed on a video display or printed on a printer, the entire cell is filled with repetitions of the character or characters entered.

Functions

Both HP-75 functions that can be used with VisiCalc and VisiCalc functions are listed below. Built-in VisiCalc functions are identified by VC following the function name:

| | |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ABS(x) | Absolute value of x . |
| ACOS(x) | Arccosine of x , in Quadrant I or II. |
| ANGLE(x,y) | Arctangent of y/x , in proper quadrant. That is, returns the angle θ formed between the x -axis and the point (x,y) , such that $-\pi < \theta \leq \pi$. |
| ASIN(x) | Arcsine of x , in Quadrant I or IV. |
| ATN(x) | Arctangent of x , in Quadrant I or IV. |
| AVERAGE(list) | VC Computes the arithmetic mean or average of the numeric parameters in the <i>list</i> . Ignores non-numeric parameters. |
| CEIL(x) | Smallest integer $\geq x$. |
| COS(x) | Cosine of x . |

| | |
|-------------------|-------------------------------------------------------------------------------------------------------------------|
| COT(x) | Cotangent of x . |
| CSC(x) | Cosecant of x . |
| DATE | The date in <i>yyddd</i> format based on the clock setting. |
| DEG(x) | Radian-to-degree conversion of x . |
| EPS | Smallest machine number ($1.E-499$). |
| ERRL | The line number of the most recent HP-75 error or warning. |
| ERRN | The identification number of the most recent HP-75 error or warning. |
| ERROR | VC Returns an "error" value that makes all expressions using the value display ERROR in the cell display. |
| EXP(x) | e^x . |
| FLOOR(x) | Same as INT(x) . |
| FP(x) | Fractional part of x . |
| INF | Largest machine number ($9.999999999999999E499$). |
| INT(x) | Largest integer $\leq x$. |
| IP(x) | Integer part of x . |
| LOG(x) | Natural logarithm of x , $x > 0$. |
| LOG10(x) | Log to the base 10 of x , $x > 0$. |
| MAX(x,y) | If $x > y$ then x , else y . |
| MAXL(list) | VC Finds the maximum value in the <i>list</i> . |
| MEAN(list) | VC Computes the arithmetic mean of the values in the <i>list</i> . MEAN is another name for the AVERAGE function. |
| MEM | The number of bytes of available HP-75 memory. |
| MIN(x,y) | If $x < y$ then x , else y . |
| MINL(list) | VC Finds the minimum value in the <i>list</i> . |
| MOD(x,y) | x modulo y : $x - y * \text{INT}(x/y)$. |

| | | |
|-----------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NA | VC | Returns a "not available" value that makes all expressions using the value display NA. Allows the effect of a particular value to be traced through the worksheet. |
| PI | | 3.14159265359. |
| RAD(x) | | Degree-to-radian conversion of x . |
| RES | | The last numeric result to be displayed or printed by the HP-75. |
| RMD(x,y) | | Remainder of x/y : $x-y*IP(x,y)$. |
| RND | | Next number, r , in sequence of pseudo-random numbers, $0 \leq r < 1$. |
| SEC(x) | | Secant of x . |
| SGN(x) | | The sign of x : -1 if $x < 0$, 0 if $x = 0$, 1 if $x > 0$. |
| SIN(x) | | Sine of x . |
| SQR(x) | | Positive square root of x . |
| SUM(list) | VC | Computes the sum of the values in the <i>list</i> . |
| TAN(x) | | Tangent of x . |
| TIME | | The number of seconds since midnight of the current day. |

Storage Operations

All mass storage operations are performed using HP-75 mass storage commands outside of VisiCalc. Worksheet files have a W in the file type field of the file catalog, and they can be COPIED, PURGED, and RENAMED, but not LISTED, PLISTED, EDITED, RUN, CALLED, TRANSFORMED, or RENUMBERED.

ASSIGN IO

Assigns device codes to HP-IL peripheral devices on the loop.

CAT CARD

Catalogs the next card track pulled through the card reader.

CAT ' : device code '

Catalogs the mass storage medium.

COPY ['file name'] TO 'card file specifier'

Copies a file from memory to card.

COPY 'card file specifier' TO 'file name'

Copies a file from card to memory.

COPY ['file name'] TO 'mass storage file specifier'

Copies a file from memory to mass storage.

COPY 'mass storage file specifier' TO 'file name'

Copies a file from mass storage to memory.

COPY 'mass storage file specifier' TO 'mass storage file specifier'

Copies a file from one mass storage medium to another.

PROTECT

Write-protects the next card track pulled through the card reader.

UNPROTECT

Removes the write-protection from the next card track pulled through the card reader.

PURGE 'mass storage file specifier'

Purges a mass storage file.

RENAME 'old file specifier' TO 'new file specifier'

Renames the specified file.

The VisiCalc module must be installed to copy worksheet files to and from mass storage media other than a magnetic card.

Extension Functions

Extension functions are specially designed BASIC programs that can be called from a formula in the same way that VisiCalc and HP-75 functions are called. A call to an extension function consists of a function name, followed by a parameter list in parentheses.

Example:

```
irr(a1...a10)
```

Extension function calls use parameter lists to pass numeric values to the function for processing. The parameters in this list are passed through the VISIDATA data file. The general form of the VISIDATA file after VisiCalc finishes writing the data in the parameter list to the file, is:

```
0 DATA number of items in parameter list,  
      number of numeric items in list
```

```
1 DATA data item 1  
2 DATA data item 2  
3 DATA data item 3
```

```
!  
n DATA data item n
```

The extension function must pass the result of its computations back to line 0 of VISIDATA. After the function terminates execution and passes the result to VISIDATA, the first line of the data file will look like this:

```
0 DATA result
```

The following outline describes the general structure of extension functions:

1. Initialize and define the variables.
2. Open the data file. VISIDATA must be assigned a file number so that the function can access it. (Example: ASSIGN # 255 TO 'visidata'.)
3. Read line 0 of the data file to get the number of parameters and the number of numeric parameters. (Example: READ # 255,0; N1,N2.)
4. Read in, and store the parameters. (Example: FOR I=1 TO N @ READ # 255; X.)
5. Test the input data for invalid or erroneous data.
6. Perform the computations that will give the desired result.
7. Return the result of the computation to line 0 of VISIDATA. (Example: PRINT # 255,0; *result*.)

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