

XCELLv2

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XCELL

IN:

2: MATRIX

$$\begin{matrix} X1 & ? \\ X2 & ? \\ X3 & ? \\ . & \\ . & \\ . & \\ Xn & ? \end{matrix} \begin{bmatrix} A & AA & AAA & . & . & . \\ B & BB & BBB & . & . & . \\ C & CC & CCC & . & . & . \\ . & & & & & \\ . & & & & & \\ . & & & & & \\ Z & & & & & \end{bmatrix}_{n \times m}$$

1: MATRIX

$$\begin{bmatrix} \text{Function1 (X1, X2, X3, ..., Xn)} \\ \text{Function2 (X1, X2, X3, ..., Xn)} \\ \text{Function3 (X1, X2, X3, ..., Xn)} \\ . \\ . \\ . \\ \text{FunctionL (X1, X2, X3, ..., Xn)} \end{bmatrix}_{L \times 1}$$

OUT:

1: MATRIX

$$\begin{bmatrix} \text{Function1 (m = 1) (X1, X2, X3, ..., Xn)} & \text{Function1 (m = 2) (X1, X2, X3, ..., Xn)} & \dots \\ \text{Function2 (m = 1) (X1, X2, X3, ..., Xn)} & \text{Function1 (m = 2) (X1, X2, X3, ..., Xn)} & \dots \\ \text{Function3 (m = 1) (X1, X2, X3, ..., Xn)} & \text{Function1 (m = 2) (X1, X2, X3, ..., Xn)} & \dots \\ . & & \\ . & & \\ . & & \\ \text{FunctionL (m = 1) (X1, X2, X3, ..., Xn)} & \text{Function1 (m = 2) (X1, X2, X3, ..., Xn)} & \dots \end{bmatrix}_{L \times m}$$

Ex. (in 4.55s by TEVAL):

IN:

$$2: \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \end{bmatrix}_{2 \times 4}$$

$$1: \begin{bmatrix} X1 + X2 \\ \text{COMB}(X2, X1) \\ \text{MAX}(X1, X2) \end{bmatrix}_{3 \times 1}$$

OUT:

$$1: \begin{bmatrix} 6 & 8 & 10 & 12 \\ 5 & 15 & 35 & 70 \\ 5 & 6 & 7 & 8 \end{bmatrix}_{3 \times 4}$$

XCROL

IN:

3: First number of the column (n1)

2: Number of lines of the column (nn)

1: Program that make the relation of the n+1 element with the n element (« ? »)

OUT:

1: MATRIX

$$\begin{bmatrix} n1 \\ n2 = n1 \rightarrow \text{«?»} \\ n3 = n1 \rightarrow \text{«?»} \\ . \\ . \\ . \\ mn = n(n-1) \rightarrow \text{«?»} \end{bmatrix}_{nn \times 1}$$

Ex. (in 0.18s by TEVAL):

IN:

3: 2

2: 5

1: « 1 + »

OUT:

$$\begin{bmatrix} 2 \\ 3 \\ 4 \\ 5 \\ 6 \end{bmatrix}_{5 \times 1}$$

MAKEM

IN:

3: Vector with n elements

2: Vector with m elements

1: Program that make the relation of the n elements with the m elements, producing a matrix $n \times m$. ($A_{n \times m} = V_n V_m \llcorner \gg$)

OUT:

1: MATRIX

$$\begin{bmatrix} V_{m1} V_{n1} \llcorner \gg & V_{m1} V_{n2} \llcorner \gg & \dots & V_{m1} V_{nn} \llcorner \gg \\ V_{m2} V_{n1} \llcorner \gg & V_{m2} V_{n2} \llcorner \gg & \dots & V_{m2} V_{nn} \llcorner \gg \\ V_{m3} V_{n1} \llcorner \gg & V_{m3} V_{n2} \llcorner \gg & \dots & V_{m3} V_{nn} \llcorner \gg \\ \vdots & \vdots & \ddots & \vdots \\ V_{mm} V_{n1} \llcorner \gg & V_{mm} V_{n2} \llcorner \gg & \dots & V_{mm} V_{nn} \llcorner \gg \end{bmatrix}$$

Ex. (in 1.13s by TEVAL):

IN:

3: [1 2 3 4]

2: [5 6 7 8]

1: $\llcorner \wedge \gg$

OUT:

$$1: \begin{bmatrix} 1 & 1 & 1 & 1 \\ 32 & 64 & 128 & 256 \\ 243 & 729 & 2187 & 6561 \\ 1024 & 4096 & 16384 & 65536 \end{bmatrix}_{4 \times 4}$$

EQMAT

IN:

2: MATRIX

1: Program « ? »

OUT:

1: MATRIX whit each element equal to those in the first MATRIX after the Program applied to each one.

Ex. (in 0.59s by TEVAL):

IN:

2: $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \end{bmatrix}_{2 \times 4}$

1: « SQ »

OUT:

1: $\begin{bmatrix} 1 & 4 & 9 & 16 \\ 25 & 36 & 49 & 64 \end{bmatrix}_{2 \times 4}$

COLAP

IN:

3: MATRIX

2: n, Number of one column of the MATRIX

1: Program to apply to each element of the n column in the MATRIX

OUT:

1: Same as the first MATRIX but now with the n column changed by de Program.

Ex. (in 0.51s by TEVAL):

IN:

3: $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \end{bmatrix}_{2 \times 4}$

2: 2

1: « SQ »

OUT:

1: $\begin{bmatrix} 1 & 4 & 3 & 4 \\ 5 & 36 & 7 & 8 \end{bmatrix}_{2 \times 4}$

MSUM

IN:

1: MATRIX

OUT:

1: MATRIX with the sum of the elements of the given MATRIX.

Ex. (in 0.64s by TEVAL):

IN:

1: $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \end{bmatrix}_{2 \times 4}$

OUT:

1: $[36]_{1 \times 1}$

LSUM

IN:

1: MATRIX

OUT:

1: MATRIX with the sum of the elements in the rows of the given MATRIX.

Ex. (in 0.40s by TEVAL):

IN:

1: $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \end{bmatrix}_{2 \times 4}$

OUT:

1: $\begin{bmatrix} 10 \\ 26 \end{bmatrix}_{2 \times 1}$

NOTES:

- The XCELL program uses and discards the variables X_n , where the n assumes 1 to the number of lines of the 1.st MATRIX.
- The number of the library is 1777, I don't know if is a good number or not, but you can make odder with the open files and the CRLIB command in your HP-49G.
- The commands AXL, HADAMARD, TRAN and others about arrays are useful to be used with xcell program.
- I hope that some one turn the XCELL program faster, because besides be a versatile program they are a little slow, maybe because it's made in UserRPL, if made in SystemRPL they be more fast. I do not have the time.
- Actually I use the 1.19-6 Version of ROM, and you can get it in the follow site: http://etud.epita.fr:8000/~avenar_j/hp/49.html
- ATTENCION: You will use the program at your own risk.
- Sorry if I write some mistake, I am not English.

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