J()	—	Matrix	of	constants
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Conformability

Description

J(r, c, val) returns an $r \times c$ matrix with each element equal to val.

J(r, c, mat) returns an $(r*rows(mat)) \times (c*cols(mat))$ matrix with elements equal to mat.

The first, J(r, c, val), is how J() is commonly used. The first is nothing more than a special case of the second, J(r, c, mat), when mat is 1×1 .

Syntax

transmorphic matrix J(real scalar r, real scalar c, scalar val)

transmorphic matrix J(real scalar r, real scalar c, matrix mat)

Remarks and examples

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Remarks are presented under the following headings:

First syntax: J(r, c, val), val a scalar Second syntax: J(r, c, mat), mat a matrix

First syntax: J(r, c, val), val a scalar

J(r, c, val) creates matrices of constants. For example, J(2, 3, 0) creates

	1	2	3	
1	0	0	0	
2	0	0	0	

J() must be typed in uppercase.

J() can create any type of matrix:

Function	Returns
J(2, 3, 4)	2×3 real matrix, each element = 4
J(2, 3, 4+5i)	2×3 complex matrix, each element = 4 + 5i
J(2, 3, "hi")	2×3 string matrix, each element = "hi"
J(2, 3, &x)	2×3 pointer matrix, each element = address of x

Also, J() can create void matrices:

J(0, J(0, J(1,	0, .) 1, .) 0, .)	$\begin{array}{l} 0 \ \times \ 0 \ \mbox{real} \\ 0 \ \times \ 1 \ \mbox{real} \\ 1 \ \times \ 0 \ \mbox{real} \end{array}$
J(0,	0, 1i)	0×0 complex
J(0,	1, 1i)	0×1 complex
J(1,	0, 1i)	1×0 complex
J(0,	0, "")	0×0 string
J(0,	1, "")	0×1 string
J(1,	0, "")	1×0 string
J(0,	O, NULL)	0×0 pointer
J(0,	1, NULL)	0×1 pointer
J(1,	0, NULL)	1×0 pointer

When J(r, c, val) is used to create a void matrix, the particular value of the third argument does not matter. Its element type, however, determines the type of matrix produced. Thus, J(0, 0, .), J(0, 0, 1), and J(0, 0, 1/3) all create the same result: a 0×0 real matrix. Similarly, J(0, 0, ..), J(0, 0, ..), J(0, 0, ..), and J(0, 0, ...) all create the same result: a 0×0 string matrix. See [M-2] void to learn how void matrices are used.

Second syntax: J(r, c, mat), mat a matrix

J(r, c, mat) is a generalization of J(r, c, val). When the third argument is a matrix, that matrix is replicated in the result. For instance, if X is $(1,2\backslash3,4)$, then J(2, 3, X) creates

	1	2	3	4	5	6	
1	1	2	1	2	1	2	
2	3	4	3	4	3	4	
3	1	2	1	2	1	2	
4	3	4	3	4	3	4	

J(r, c, val) is a special case of J(r, c, mat); it just happens that mat is 1×1 .

The matrix created has *r**rows(*mat*) rows and *c**cols(*mat*) columns.

Note that J(r, c, mat) creates a void matrix if any of r, c, rows(mat), or cols(mat) are zero.

Conformability

J(r, c, val):	
<i>r</i> :	1×1
<i>c</i> :	1×1
val:	1×1
result:	$r \times c$
J(r, c, mat):	
<i>r</i> :	1×1
<i>c</i> :	1×1
mat:	$m \times n$
result:	$r^*m \times c^*n$

Diagnostics

J(r, c, val) and J(r, c, mat) abort with error if r < 0 or c < 0, or if $r \ge .$ or $c \ge .$. Arguments r and c are interpreted as trunc(r) and trunc(c).

Also see

- [M-5] missingof() Appropriate missing value
- [M-4] Standard Functions to create standard matrices

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