

Description

`Toeplitz(cI, rI)` returns the Toeplitz matrix defined by cI being its first column and rI being its first row. A Toeplitz matrix T is characterized by $T[i, j] = T[i - 1, j - 1]$, $i, j > 1$. In a Toeplitz matrix, each diagonal is constant.

Vectors cI and rI specify the first column and first row of T .

Syntax

numeric matrix `Toeplitz(numeric colvector cI, numeric rowvector rI)`

Remarks and examples

$cI[1]$ is used to fill $T[1, 1]$, and $rI[1]$ is not used.

To obtain the symmetric (Hermitian) Toeplitz matrix, code `Toeplitz(v, v')` (if v is a column vector), or `Toeplitz(v', v)` if v is a row vector.

Conformability

`Toeplitz(cI, rI)`:

cI : $r \times 1$
 rI : $1 \times c$
 $result$: $r \times c$

Diagnostics

None.

Otto Toeplitz (1881–1940) was born in Breslau, Germany (now Wrocław, Poland), and educated there in mathematics. He researched and taught at universities in Göttingen, Kiel, and Bonn, making many contributions to algebra and analysis, but he was dismissed in 1935 for being a Jew. Toeplitz emigrated to Palestine in 1939 but died a few months later in Jerusalem. He was fascinated by the history of mathematics and wrote a popular work with Hans Rademacher, *The Enjoyment of Mathematics*.

Reference

Robinson, A. 1976. “Toeplitz, Otto”. In *Dictionary of Scientific Biography*, edited by C. C. Gillispie, vol. 13. New York: Scribner’s.

Also see

[M-4] **Standard** — Functions to create standard matrices

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