circshift

circularly shifts elements or subarrays of an array (regular, of structures, cells, custom)

Syntax

```
B = circshift(A, shift)
B = circshift(A, shift, 0)
B = circshift(A, shifts)
B = circshift(A, shifts, dims)
```

Arguments

A, B

row, column, matrix, hypermatrix or array or hyperarray of any number of dimensions and of any sizes. **B** has the shape, sizes and type of **A**. Custom types are accepted provided that `size()`, insertion, and extraction operators are defined for **A**'s type.

shift

unique positive or negative integer: the shift to apply to indices along the first non-singleton dimension, or to linear indices of **A** components if `0` is used as third input argument.

shifts

vector of positive or negative integers: shifts to apply on ranges along directions specified in **dims** (or `1:length(shifts)` by default).

dims

Vector of integers in `[1, ndims(A)]`: indices of **A** dimensions along which the respective `shifts` must be performed.

Description

`circshift(A, shift)` shifts along the first dimension of `A` of size > 1.

`circshift(A, shift, 0)` circularly shifts `A` components by **shift** positions.

`circshift(A, shifts)` circularly shifts indices of `A` rows by `shifts(1)`, indices of `A` columns by `shifts(2)`, indices of `A` layers by `shifts(3)`, etc.

`circshift(A, shifts, dims)` circularly shifts `A` by `shifts(1)` along its dimension #`dims(1)`, by `shifts(2)` along its dimension #`dims(2)`, etc.

Examples

```
circshift(1:7, 2)
circshift(1:7, -1)
```

```
--> circshift(1:7, 2)
 ans  =
   6.   7.   1.   2.   3.   4.   5.

--> circshift(1:7, -1)
 ans  =
   2.   3.   4.   5.   6.   7.   1.
```

```
M = matrix(1:12, 3, 4)
circshift(M, 1)
circshift(M, 1, 2)
circshift(M, [-1 1])
circshift(M, [-2 1], [2 1])
```

```
--> M = matrix(1:12, 3, 4)
 M  =
   1.   4.   7.   10.
   2.   5.   8.   11.
   3.   6.   9.   12.

--> circshift(M, 1)
 ans  =
   3.   6.   9.   12.
   1.   4.   7.   10.
   2.   5.   8.   11.

--> circshift(M, 1, 2)
 ans  =
   10.   1.   4.   7.
   11.   2.   5.   8.
   12.   3.   6.   9.

--> circshift(M, [-1 1])
 ans  =
   11.   2.   5.   8.
   12.   3.   6.   9.
   10.   1.   4.   7.

--> circshift(M, [-2 1], [2 1])
 ans  =
   9.   12.   3.   6.
   7.   10.   1.   4.
   8.   11.   2.   5.
```

```
M = matrix(1:12, 3, 4)
circshift(M, 5, 0)
```

```
--> circshift(M, 5, 0)
 ans  =
   8.    11.   2.   5.
   9.    12.   3.   6.
   10.   1.    4.   7.
```

With an hypermatrix of texts:

```
t = matrix([string(1:12) strsplit("a":"l")' strsplit("A":"L")'],3,4,3)
circshift(t, 1, 0)
circshift(t, 1)
circshift(t, 1, 3)
circshift(t, [1 -1], [2 3])
```

```
--> t = matrix([string(1:12) strsplit("a":"l")' strsplit("A":"L")'],3,4,3)
 t  =
(:,:,1)
!1  4  7  10  !
!2  5  8  11  !
!3  6  9  12  !

(:,:,2)
!a  d  g  j  !
!b  e  h  k  !
!c  f  i  l  !

(:,:,3)
!A  D  G  J  !
!B  E  H  K  !
!C  F  I  L  !

--> circshift(t, 1, 0)
 ans  =
(:,:,1)
```

```
!L   3   6   9    !
!1   4   7   10   !
!2   5   8   11   !

(:,:,2)
!12   c   f   i   !
!a    d   g   j   !
!b    e   h   k   !

(:,:,3)
!l   C   F   I   !
!A   D   G   J   !
!B   E   H   K   !

--> circshift(t, 1)
 ans  =
(:,:,1)
!3   6   9   12   !
!1   4   7   10   !
!2   5   8   11   !

(:,:,2)
!c   f   i   l   !
!a   d   g   j   !
!b   e   h   k   !

(:,:,3)
!C   F   I   L   !
!A   D   G   J   !
!B   E   H   K   !

--> circshift(t, 1, 3)
 ans  =
(:,:,1)
!A   D   G   J   !
!B   E   H   K   !
!C   F   I   L   !

(:,:,2)
!1   4   7   10   !
!2   5   8   11   !
!3   6   9   12   !

(:,:,3)
!a   d   g   j   !
!b   e   h   k   !
!c   f   i   l   !

--> circshift(t, [1 -1], [2 3])
 ans  =
(:,:,1)
!j   a   d   g   !
!k   b   e   h   !
!l   c   f   i   !

(:,:,2)
!J   A   D   G   !
!K   B   E   H   !
!L   C   F   I   !

(:,:,3)
!10   1   4   7   !
!11   2   5   8   !
!12   3   6   9   !
```

With an array of cells:

```
L = list(1,%t);
C = {%f "a" %i  %z
      %t "b" %e  %s
       0 "c" %pi L }
circshift(C, 1, 0)
circshift(C, 1)
circshift(C, 1, 2)
circshift(C, [1 -1])
```

See also

- flipdim
- fftshift

History

Version	Description
6.1	`circshift()` introduced.

Report an issue

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