

vec() — Stack matrix columns

| Description | Syntax | Remarks and examples |
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| Conformability | Diagnostics | Also see |

Description

$\text{vec}(T)$ returns T transformed into a column vector with one column stacked onto the next.

$\text{vech}(T)$ returns square and typically symmetric matrix T transformed into a column vector; only the lower half of the matrix is recorded.

$\text{invvech}(v)$ returns $\text{vech}()$ -style column vector v transformed into a symmetric (Hermitian) matrix.

Syntax

transmorphic colvector `vec(transmorphic matrix T)`

transmorphic colvector `vech(transmorphic matrix T)`

transmorphic matrix `invvech(transmorphic colvector v)`

Remarks and examples

Remarks are presented under the following headings:

Example of `vec()`

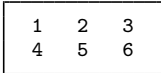
Example of `vech()` and `invvech()`

Example of `vec()`

```

: x
      1  2  3
1     1  2  3
2     4  5  6

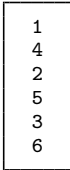
```



```

: vec(x)
      1
1     1
2     4
3     2
4     5
5     3
6     6

```



Example of `vech()` and `invvech()`

```

: x
[symmetric]
  1  2  3
1  1
2  2  4
3  3  6  9

: v = vech(x)
: v
  1
1  1
2  2
3  3
4  4
5  6
6  9

: invvech(v)
[symmetric]
  1  2  3
1  1
2  2  4
3  3  6  9

```

Conformability

`vec(T)`:

T: $r \times c$
result: $r * c \times 1$

`vech(T)`:

T: $n \times n$
result: $(n(n + 1))/2 \times 1$

`invvech(v)`:

v: $(n(n + 1))/2 \times 1$
result: $n \times n$

Diagnostics

`vec(T)` cannot fail.

`vech(T)` aborts with error if *T* is not square. `vech()` records only the lower triangle of *T*; it does not require *T* be symmetric.

`invvech(v)` aborts with error if *v* does not have 0, 1, 3, 6, 10, ... rows.

Also see

[M-4] [manipulation](#) — Matrix manipulation