<div style="border:1px solid black; padding:10px;">

select( ) — Select rows, columns, or indices

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Description

select(X, v) returns X

1. omitting the rows for which $v[i]$==0 (v a column vector) or

2. omitting the columns for which $v[j]$==0 (v a row vector).

st_select(A, X, v) does the same thing, except that the result is placed in A and, if X is a view, A will be a view.

selectindex(v) returns

1. a row vector of column indices j for which $v[j]$!=0 (v a row vector) or

2. a column vector of row indices i for which $v[i]$!=0 (v a column vector).

Syntax

> *transmorphic matrix* select(*transmorphic matrix X* , *real vector v*)
>
> *void*   st_select(*A*, *transmorphic matrix X* , *real vector v*)
>
> *real vector*   selectindex(*real vector v*)

Remarks and examples

Remarks are presented under the following headings:

> *Examples*
> *Using st_select()*

Examples

1. To select rows 1, 2, and 4 of $5 \times c$ matrix X,

        submat = select(X, (1\1\0\1\0))

    See [M-2] **Subscripts** for another solution, submat = X[(1\2\4), .].

2. To select columns 1, 2, and 4 of $r \times 5$ matrix X,

        submat = select(X, (1,1,0,1,0))

    See [M-2] **Subscripts** for another solution, submat = X[., (1,2,4)].

3. To select rows of X for which the first element is positive,

> submat = select(X, X[.,1]:>0)

4. To select columns of X for which the first element is positive,

> submat = select(X, X[1,.]:>0)

5. To select rows of X for which there are no missing values,
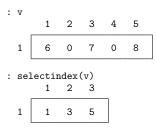
> submat = select(X, rowmissing(X):==0)

6. To select rows and columns of square matrix X for which the diagonal elements are positive,

```
pos    = diagonal(X):>0
submat = select(X, pos)
submat = select(submat, pos')
```
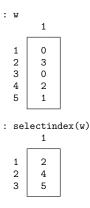
or, equivalently,

```
pos    = diagonal(X):>0
submat = select(select(X, pos), pos')
```

7. To select column indices for which v[j]!=0,

```
: v
```

	1	2	3	4	5
1	6	0	7	0	8

```
: selectindex(v)
```

	1	2	3
1	1	3	5

8. To select row indices for which v[i]!=0,

```
: w
```

	1
1	0
2	3
3	0
4	2
5	1

```
: selectindex(w)
```

	1
1	2
2	4
3	5

Using st_select()

Coding

        st_select(submat, X, v)   (1)

produces the same result as coding

        submat = st_select(X, v)   (2)

The difference is in how the result is stored. If X is a view (it need not be), then (1) will produce submat as a view or, if you will, a subview, whereas in (2), submat will always be a regular (nonview) matrix.

When X is a view, (1) executes more quickly than (2) and produces a result that consumes less memory.

See [M-5] **st_view( )** for a description of views.

Conformability

select(X, v):

X:	$r_1 \times c_1$			
v:	$r_1 \times 1$	or	$1 \times c_1$	
result:	$r_2 \times c_1$	or	$r_1 \times c_2$,	$r_2 \leq r_1, c_2 \leq c_1$

st_select(A, X, v):

input:

X:	$r_1 \times c_1$			
v:	$r_1 \times 1$	or	$1 \times c_1$	

output:

A:	$r_2 \times c_1$	or	$r_1 \times c_2$,	$r_2 \leq r_1, c_2 \leq c_1$

selectindex(v):

v:	$r_1 \times 1$	or	$1 \times c_1$	
result:	$r_2 \times 1$	or	$1 \times c_2$,	$r_2 \leq r_1, c_2 \leq c_1$

Diagnostics

None.

Also see

[M-5] **st_subview( )** — Make view from view

[M-2] **op_colon** — Colon operators

[M-2] **Subscripts** — Use of subscripts

[M-4] **Utility** — Matrix utility functions