**spmatrix fromdata** — Create custom weighting matrix from data

### Description

`spmatrix fromdata` creates custom spatial weighting matrices from Sp data.

There are two other ways to create custom weighting matrices: `spmatrix userdefined` and `spmatrix spfrommata`. Those ways may require less work, but they require knowledge of Mata.

### Quick start

Create spectral-normalized spatial weighting matrix $W_{\text{new}}$ from the $N \times N$ “matrix” stored in variables $x_1, x_2, \ldots, x_n$

```stata
spmatrix fromdata Wnew = x1 - xn
```

### Menu

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### Syntax

```
spmatrix fromdata spmatname = varlist [, options]
```

`spmatname` is the name of the spatial weighting matrix to be created.

<table>
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<th>options</th>
<th>Description</th>
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<td>idistance</td>
<td>store reciprocal of elements</td>
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<tr>
<td><code>normalize(normalize)</code></td>
<td>type of normalization; default is <code>normalized(spectral)</code></td>
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<tr>
<td>replace</td>
<td>replace existing weighting matrix</td>
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### Options

`idistance` converts distance to inverse distance by storing the reciprocal of the elements.

`normalize(normalize)` specifies how the resulting matrix is to be scaled. `normalize(spectral)` is the default. `normalize(minmax)`, `normalize(row)`, and `normalize(none)` are also allowed.

See [SP] `spmatrix create` for full details of the option and *Choosing weighting matrices and their normalization* in [SP] `spregress` for details about normalization.

`replace` specifies that matrix `spmatname` be overwritten if it already exists.
Remarks and examples

The `fromdata` in `spmatrix fromdata` means that the matrix itself is stored as variables in the data. Some researchers are used to working this way, and if you are among them, `spmatrix fromdata` is for you.

If the matrix is stored with the variables because you created it using the data, you may want to consider using `spmatrix userdefined` and `spmatrix spfrommata` instead. Both require knowledge of Mata, so that is a disadvantage if you do not already know Mata. On the other hand, `spmatrix userdefined` does not require much knowledge and handles the creation of most custom weighting matrices simply and elegantly. `spmatrix spfrommata` requires more extensive knowledge of Mata, but it will handle problems that no other method can.

The problem with `spmatrix fromdata` is not that the matrix is stored in the data but that filling in the matrix is more work than it needs to be. Stata draws a distinction between rows and columns. Rows are observations and columns are variables. Stata is perfectly willing to sweep down observations, but few Stata commands will sweep across variables. Mata, being a matrix language, draws no such distinction.

Also see

[SP] `spmatrix` — Categorical guide to the spmatrix command
[SP] `spmatrix spfrommata` — Copy Mata matrix to Sp
[SP] `spmatrix userdefined` — Create custom weighting matrix
[SP] `Intro` — Introduction to spatial data and SAR models

`Mata Reference Manual`