

COMOVEMENT**PURPOSE**

Compute the Leigh-Perlman comovement coefficient between two variables.

DESCRIPTION

The formula for the comovement coefficient is:

$$\text{comove} = \frac{\sum_{i=2}^N (x_i - x_{i-1})(y_i - y_{i-1})}{\sqrt{\sum_{i=2}^N (x_i - x_{i-1})^2 \sum_{i=2}^N (y_i - y_{i-1})^2}} \quad (\text{EQ 2-4})$$

The computed coefficient has a value between -1 and +1. This formula is similar to the correlation coefficient. However, instead of subtracting the mean from X_i or Y_i , the previous value is subtracted. That is, the correlation coefficient measures the distance from the mean of corresponding X and Y values while the comovement coefficient measures the distance from the most recent value for corresponding X and Y values. The two variables must have the same number of elements.

SYNTAX

LET <par> = COMOVEMENT <y1> <y2> <SUBSET/EXCEPT/FOR qualification>
 where <y1> is the first response variable;
 <y2> is the second response variable;
 <par> is a parameter where the computed comovement is stored;
 and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

```
LET A = COMOVEMENT Y1 Y2
LET A = COMOVEMENT Y1 Y2 SUBSET TAG > 2
```

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

RANK COMOVEMENT	=	Compute the rank comovement of two variables.
CORRELATION	=	Compute the correlation of a variable.
COVARIANCE	=	Compute the covariance between two variables.
VARIANCE	=	Compute the variance of a variable.

REFERENCE

"An Index for Comovement of Time Sequences with Geophysical Applications: A Working Paper," Leigh and Perlman, Penn State Interface Conference on Astronomy, August, 1991.

APPLICATIONS

Exploratory Data Analysis

IMPLEMENTATION DATE

91/8

PROGRAM

```
SKIP 25
READ HAYES1.DAT JUNK Y1 Y2
LET A1 = COMOVEMENT Y1 Y2
```

The computed comovement coefficient is 0.65.