AUTOCOVARIANCE

PURPOSE

Compute the lag 1 autocovariance of a variable.

DESCRIPTION

The lag 1 autocovariance of a variable is the covariance between X_i and X_{i+1}. It has the formula:

$$c_1 = \frac{\sum_{i=1}^{N-1} (x_t - \bar{x})(x_{t+1} - \bar{x})}{N}$$ **(EQ 2-2)**

SYNTAX

LET <par> = AUTOCOVARIANCE <y>   <SUBSET/EXCEPT/FOR qualification>

where <y> is a response variable;

    <par> is a parameter where the computed autocovariance is stored;

and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = AUTOCOVARIANCE Y1

LET A = AUTOCOVARIANCE Y1 SUBSET TAG > 2

NOTE

To compute the autocovariance for lags 1 through n, do the following:

LET NSIZE = SIZE Y1; LET TAG = SEQUENCE 1 1 NSIZE

LOOP FOR K = 1 1 NSIZE

    LET YTEMP1 = Y1; LET YTEMP2 = Y1; LET TEMP = NSIZE - K

    RETAIN YTEMP1 SUBSET TAG > K; RETAIN YTEMP2 SUBSET TAG < TEMP

    LET TEMP = COVARIANCE YTEMP1 YTEMP2

    LET AC(LAG) = TEMP

END OF LOOP

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

AUTOCORRELATION PLOT	=	Generate an autocorrelation plot.
AUTOCOVARIANCE STAT PLOT	=	Generate an autocovariance versus subset plot.
AUTOCORRELATION	=	Compute the autocorrelation between two variables.
COVARIANCE	=	Compute the covariance between two variables.
YPLOT	=	Internal variable that contains the y coordinates of the most recent plot.

REFERENCE

"Time Series Analysis: Forecasting and Control," Box and Jenkins, Holden-Day, 1976 (page 32).

APPLICATIONS

Time Series Analysis

IMPLEMENTATION DATE

Pre-1987

PROGRAM

SKIP 25; READ LEW.DAT BEAM

LET A1 = AUTOCOVARIANCE BEAM