

PRINCIPAL COMPONENTS TYPE

PURPOSE

Specify the input format of the data for the PRINCIPAL COMPONENTS command.

DESCRIPTION

See the documentation for the PRINCIPAL COMPONENTS command for a description of principal components.

Principal components reduce to the problem of finding the eigenvalues and eigenvectors of the covariance (or correlation matrix) of the data matrix. In addition, the data matrix can be raw data, a covariance matrix, or a correlation matrix.

The PRINCIPAL COMPONENTS TYPE command specifies two things. First, it specifies whether the data matrix is raw data, a covariance matrix, or a correlation matrix. Second, it specifies whether the principal components are calculated from the covariance or the correlation matrix.

SYNTAX

PRINCIPAL COMPONENTS TYPE <key1> <key2>

where <key1> is one of the following:

- DATA - original matrix is raw data
- COVARIANCE - original matrix is a covariance matrix
- CORRELATION - original matrix is a correlation matrix;

and <key2> is one of the following:

- COVARIANCE - principal components computed from a covariance matrix
- CORRELATION - principal components computed from a correlation matrix.

EXAMPLES

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PRINCIPAL COMPONENTS TYPE DATA COVARIANCE
PRINCIPAL COMPONENTS TYPE DATA CORRELATION
PRINCIPAL COMPONENTS TYPE COVARIANCE COVARIANCE
PRINCIPAL COMPONENTS TYPE COVARIANCE CORRELATION
PRINCIPAL COMPONENTS TYPE CORRELATION CORRELATION
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NOTE

If the original data is a correlation matrix, principle components can only be computed from a correlation matrix. That is, the command PRINCIPAL COMPONENTS TYPE CORRELATION COVARIANCE is not supported.

DEFAULT

The original matrix is raw data and the principal components are calculated from a covariance matrix.

SYNONYMS

None

RELATED COMMANDS

CORRELATION MATRIX	=	Compute the correlation matrix of a matrix.
VARIANCE-COVA MATRIX	=	Compute the variance-covariance matrix of a matrix.
PRINCIPAL COMPONENTS	=	Compute principal components.

REFERENCE

“Principal Components and Factor Analysis: Part I - Principal Components,” Jackson, Journal of Quality Technology, October, 1980.

“Multivariate Statistical Methods,” Morrison, McGraw-Hill, 1976.

APPLICATIONS

Multivariate Analysis

IMPLEMENTATION DATE

87/10

PROGRAM 1

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ROW LIMITS 26 50
COLUMN LIMITS 20 132
READ MATRIX AUTO79.DAT X
LET P = MATRIX NUMBER OF COLUMNS X
PRINCIPAL COMPONENTS TYPE DATA COVARIANCE
LET Y = PRINCIPAL COMPONENTS X
LET A = PRINCIPAL COMPONENTS EIGENVECTORS X
LET E = PRINCIPAL COMPONENTS EIGENVALUES X
```