

spi

Create a time series of the Standardised Precipitation Index

Description

The program calculates a time series of the Standardised Precipitation Index (SPEI) at a given time interval from an input data file containing a monthly time series of precipitation.

Usage

```
spi [timeInterval] [inputFile] [outputFile]
```

Arguments

<code>timeInterval</code>	A time interval, in months.
<code>inputFile</code>	The name of an input file, with extension.
<code>outputFile</code>	The name of the output file to be produced, with extension.

Details

The SPI index is a standardised monthly value indicating the departure of a given month's cumulative precipitation from the average value for that month. Details on the index calculation and applications can be found in the references below.

The SPI can be calculated at the monthly scale with `timeInterval = 1`, or accumulated at more than one month with `timeInterval > 1`. Typical values are 1, 3, 6, 12 and 24 months. If the accumulated index is calculated, the starting date of the resulting SPI series will be lagged a number of months equal to `timeInterval - 1`.

The input file (`inputFile`) can have any extension, but must be a plain text file (ASCII). The file structure is as follows:

```
sao paulo
1900;01
12
197.10
...
```

The first line contains the name of the observatory, and is only used for identification

purposes. The second line contains the year and month of the first record in the time series, separated by a semi-colon (;). The third line contains the seasonality of the time series, and must be set to 12. The data series of monthly cumulative precipitation starts from line four. The series must be continuous. Gaps and missing-values are not allowed.

The output file (`outputFile`) can have any extension. It will be a plain text (ASCII) file, with the following structure:

```
sao paulo
1900;12
12
0.269214
...
```

The first two lines contain the name of the station and initial date of the SPI series. The third line contains a value indicating the cumulative parameter used, `timeInterval` (twelve months in the example). The SPI time series follows, starting from line four.

The program is run from the Windows console. The easiest way is to locate the program and the input file(s) in the same directory. If you need to run the program from a different location, it might be necessary to modify the `path` system variable to include the path to the directory where the program was installed.

It is easy to create a batch script for automating the calculation of the SPI over a large number of observatories or for several accumulated periods.

A hint on the usage of the program is obtained if `spi` is invoked with no arguments or with a wrong number of arguments.

See Also

`spei` program.

Examples

```
spi 1 saopaulo.txt saopaulo_spi_1.txt
spi 12 saopaulo.txt saopaulo_spi_12.txt
```

The above lines calculate the monthly SPI and the 12-months cumulative SPI time series for Sao Paulo (Brasil).

References

McKee, T.B.N., Doesken, J. y Kleist, J., (1993): The relationship of drought frequency and duration to time scales. *Eight Conf. On Applied Climatology*. Anaheim, CA, Amer. Meteor. Soc. 179-184.