By following the sequence of commands recorded in this log, you will be able to fit a trend to the monthly data on U.S. Retail Sales. Using one of the facilities of the program, you will also be able to extract the seasonal component from the data.

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IDEOLOG.PAS: Ideal Filters and their Approximations

1. Page Parameters
→ **1**

SPECIFY THE PAGE PARAMETERS

Do you want to output in Postscript Y/N?
→ **N**

Specify the frame surrounding the graph.
5cm x 3cm <= width x height <= 13.5cm x 9.5cm.

For two diagrams per page use 9cm times 6cm
For three diagrams per page use 9cm times 3.75cm

Specify the width
→ **99**
Specify the height
→ **99**

2. Get the Data and/or Transform the Data
→ **2**

1. Read the Data
→**1**

Name the new data file =
→ **salesus.txt**

DECIDE! Do you wish to construct a univariate series
By joining the lines? Y/N
→ **Y**

READ A DATA FILE

There are 144 data points
What is the interval between observations?

(m) Monthly
→ **m**

NAME THE DATA

By default the data will be described as
<<an unidentified data series>>

Do you wish to rename the data Y/N?
→ **N**

GET THE DATA

3. Transform the Data
→ **3**

TRANSFORM THE DATA

2. Take Natural Logarithms
→**2**

7. Return to the Main Menu
→ **7**

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9. Frequency-Domain Filters
→ **9**

SPECIFY AND APPLY THE FREQUENCY DOMAIN FILTER;

1. Lowpass Filter
→ **1**

SPECIFY THE FREQUENCY DOMAIN LOWPASS FILTER

A. The frequency filter may be applied to the differenced data and, thereafter, the filtered sequence can be reinflated via a summation operation.
→ **A**

Specify the cut-off point in degrees
→ **25**

TREAT THE END-OF-SAMPLE PROBLEM

Do you wish to extrapolate the data Y/N?
→ **Y**

POLYNOMIAL EXTRAPOLATION AND TAPERING

What proportion of the original data in each extensions?
Specify the proportion as a percentage
→ **25**

FIT A POLYNOMIAL TREND

2. Fit by Weighted Least-Squares Regression
→ **2**

SPECIFY THE WEIGHTING FUNCTION

Do you accept that the minimum weight should be unity Y/N?
→ **Y**

Specify the maximum value for the weights
→ **8**

SPECIFY THE WEIGHTING FUNCTION

3. Cosine-Bell Weighting Function
→ **3**

COSINE-BELL WEIGHTING FUNCTION

Do you wish to interpolate a middle segment Y/N?
→ **Y**

Specify the relative length of the middle range as a percentage
→ **75**

<<The profile of the weights applied to the
data points in the polynomial regression>>
→ **<RETURN>**

What is the degree of the polynomial?
→ **1**

<<The plot of 216 points of an unidentified data series>>
→ **<RETURN>**

<<A polynomial of degree 1 interpolated by weighted least squares

EXTRACT LOWPASS TREND COMPONENT

Before estimating the trend, you may require to reduce the
data to stationarity by at most two differencing operations.

Specify the number of differencing operations
→**2**

DISCARD THE EXTRAPOLATIONS

The data have been supplemented by 36 points at each end
Do you wish to discard the extrapolated data points Y/N?
→ **Y**

<<A low-frequency trend/cycle component extracted from
144 points of an unidentified data sequence by a Fourier Method>>
→ **<RETURN>**

<<The residual sequence from detrending 144 points of
an unidentified data series via the Fourier Method>>
→ **<RETURN>**

Now we may proceed to extract the seasonal component from the logarithmic data sequence

SPECIFY AND APPLY THE FREQUENCY DOMAIN FILTER;

3. De-seasonalising BandStop Filter
→ **3**

REMOVE SASONAL FLUCTUATIONS FROM THE DATA

3.Take Differences of the Data
→ **3**

Specify the order of the differencing operator
→ **2**

REMOVE SASONAL FLUCTUATIONS FROM THE DATA

4.Continue
→ **4**

ESTIMATE THE SEASONAL COMPONENT

We include, within the seasonal component, the elements at the seasonal frequency of 30 degrees and at the harmonic frequencies of 60 degrees, 90 degrees, 120 degrees, 150 degrees and 180 degrees. In addition, we include two elements at the points immediately above120 degrees.

Do you wish to add some supplementary nonharmonic frequencies Y/N?
→ **Y**

How many additional Fourier points below 30 degrees
→ **0**
How many additional Fourier points above 30 degrees
→ **0**

ETC.
ETC.

How many additional Fourier points below 120 degrees
→ **0**
How many additional Fourier points above 120 degrees
→ **2**

ETC.
ETC.

How many additional Fourier points below 180 degrees
→ **0**

<<The seasonal component extracted from
144 points of an unidentified data series>>
→ **<RETURN>**

<<A seasonally adjusted version of a sequence
of 144 points of an unidentified data series>>
→ **<RETURN>**