Subject: Re: Most Common IDL Programming Errors
Posted by Kenneth P. Bowman on Wed, 09 Apr 2008 16:31:15 GMT
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In article <MPG.22666eb3ce01c4fd98a324@news.frii.com>,
David Fanning <news@dfanning.com> wrote:

> Kenneth P. Bowman writes:
>
>> David, I have some EOF code that is only a few lines long if you want it
>> (using LA_EIGENQL).
>
> Yes, thank you. We are having difficulties determining which
> is the "correct" implementation around here. We are going
> to take a vote later today. I could use more ammunition. :-)
>
> Cheers,
>
> David

The input array 'values' is an nvar x nt (number of times) observation matrix.

This code first calculates the nvar x nvar covariance matrix 'cov' by using MATRIX_MULTIPLY. For large data sets you may want to compute the covariance matrix out of memory.

The eigenvalues and eigenvectors are found using LA_EIGENQL. The code calculates the first 'nev' eigenvalues and eigenvectors of the covariance matrix. (I say first because we normally sort the eigenvalues from largest to smallest. LA_EIGENQL does the reverse, so actually it is the last 'nev' eigenvalues, hence the calls to REVERSE.)

```
cov      = MATRIX_MULTIPLY(values, values, /BTRANSPOSE)/nt ;Compute covariance matrix
eigenval = LA_EIGENQL(cov, EIGENVECTORS = eigenvec, $      ;Compute eigenvalues and eigenvectors
  RANGE = [nvar - nev, nvar-1])
eigenval = REVERSE(eigenval)                               ;Sort eigenvalues from largest to smallest
eigenvec = REVERSE(eigenvec, 2)                            ;Sort eigenvectors as eigenvalues
```

Cheers, Ken