
Subject: Re: least square matrix

Posted by [Craig Markwardt](#) on Fri, 11 Mar 2005 13:22:11 GMT

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"Matthias Demuzere" <Matthias.demuzere@geo.kuleuven.ac.be> writes:

> Hi,
>
> Because my question maybe still a bit unclear, here it is again:
>
> I have a dataset of temperatures taken at hourly steps (k-value, ranging
> from 1-24) for a whole
> month (with i days). Now, I would like to compare each temperature $T_{k,i}$ with
> every other $T_{k,j}$ with j the same number of days as in i. I would like to do
> that comparison by least square methods like this
>
> Matrix $A_{i,j} = \sum (T_{k,i} - T_{k,j})^2$
>
> where the matrix $A_{i,j}$ is a symmetrical matrix (because i,j are the same
> day).

In IDL notation, this would be:

```
FOR I = 0, NDAYS-1 DO FOR J = 0, NDAYS-1 DO $  
  A(I,J) = TOTAL(T(*,I) - T(*,J))
```

assuming $A = \text{FLTARR}(\text{NDAYS}, \text{NDAYS})$ and $T = \text{FLTARR}(24, \text{NDAYS})$. As an exercise, you could optimize to only do $I \text{ GT } J$.

>
> How can that be done in IDL?
>
> I was thinking of some FOR statements, like this:
>
> FOR i=1, i LE 31, i++ DO BEGIN
> FOR j=1, j LE 31, j++ DO BEGIN
> FOR k=1, k LE 24, k++ DO BEGIN
> function
> ENDFOR
> ENDFOR
> ENDFOR
>
> But this doesn't seems to work really...Any idees, tips,...??

No, it wouldn't work, because it's not IDL. I invite you to read up on the FOR statement in the documentation, but here are some starters:

- * IDL array indices start with 0
- * IDL's FOR statement is not C-like

Good luck,

Craig

--

Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response

Subject: Re: least square matrix
Posted by [James Kuyper](#) on Fri, 11 Mar 2005 14:43:56 GMT
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> How can that be done in IDL?

$\sum (T_{k,i} - T_{k,j})^2$
 $= \sum (T_{k,i}^2 - 2T_{k,i}T_{k,j} + T_{k,j}^2)$
 $= \sum (T_{k,i}^2) - 2 \sum (T_{k,i}T_{k,j}) + \sum (T_{k,j}^2)$

$T = \text{indgen}(31,24) * 0.1$
 $T2 = (T^2) \# \text{replicate}(1,24,31)$
 $A = T2 - 2 * T \# \text{transpose}(T) + \text{transpose}(T2)$
