Subject: Re: How does REFORM work in PV-Wave
Posted by thompson on Thu, 02 Dec 1999 08:00:00 GMT
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jeyadev@wrc.xerox.com (Surendar Jeyadev) writes:

> In article <mgs-52612D.20571630111999@news.silcom.com>,
> Mike Schienle <mgs@ivsoftware.com> wrote:
>>
>> You can probably find more than you wanted to know abot row and column
>> order by visiting the IDL FAQ at <http://www.ivsoftware.com:8000/FAQ/>.
>> Select the "Search FAQ" button. Enter the word "major" in the "Question"
>> field and press the "Start Search" button. You'll be treated to a fairly
>> detailed discussion on column- and row-major, as well as memory access
>> into the arrays.

> Found it, at last, by listing all the questions, but I know all *that*
> stuff.

> My question was what happens beyond 2 dimensions and how REFORM treats
> a 2d to 3d coversion. I will simplify my question in the hope that some
> kind soul will help me out.

> Let us say that I have the data file

>   1   13
>   2   14
>   3   15
>   4   16
>   5   17
>   6   18
>   7   19
>   8   20
>   9   21
>   10   22
>   11   23
>   12   24

> and that the first column represents data for a variable that is defined
> on a 3 x 4 (i.e. 3 column and 4 rows) grid and the second column is for
> another variable on the same grid. Assume that the data is stored in the
> the array odat(2,12).

> What is I want to do is the following: I want to create a 3 data array
> with two planes of 3 x 4 elements so that each plane contains the the data
> for one variable.

> The REAL QUESTION: The command

> data = reform(odat,2,3,4)

> seems to do the job. For example

```
> WAVE> a = data(0,*,*)
> WAVE> info, a
> A               INT       = Array(1, 3, 4)
> WAVE> a = reform(a)
> WAVE> info, a
> A               INT       = Array(3, 4)
> WAVE> print, a
>       1       2       3
>       4       5       6
>       7       8       9
>      10      11      12
```

> which is exactly what I want. Now, what I would like to know is why the
> number of planes (2) had to be the *first* index in the reform statement.

> thanks
> --

> Surendar Jeyadev jeyadev@wrc.xerox.com

Surendar:

The basic answer is as follows. Your odat(2,12) array is really stored as a series of numbers. You can see the way the array is stored by the command

```
IDL> print,odat(*)
      1      13       2      14       3      15       4      16       5
     17       6      18       7      19       8      20       9      21
     10      22      11      23      12      24
```

By formatting this into a (2,12) array, you tell IDL to organize it into the indices

```
 odat(0,0) = 1
 odat(1,0) = 13
 odat(0,1) = 2
 odat(1,1) = 14
 odat(0,2) = 3
 odat(1,2) = 15
 odat(0,3) = 4
     etc.
```

If you then reformat it into a (2,3,4) array, it will be stored as

odat(0,0,0) = 1
odat(1,0,0) = 13
odat(0,1,0) = 2
odat(1,1,0) = 14
odat(0,2,0) = 3
odat(1,2,0) = 15
odat(0,0,1) = 4
    etc.

The leftmost index always increases most rapidly, and the rightmost index always increases most slowly. The REFORM() function doesn't rearrange the numbers in memory--it just changes how they're interpreted.

William Thompson
