Subject: Re: Ohmygod, another round of column/row-major...
Posted by Steve Scheele on Wed, 03 Mar 1999 08:00:00 GMT
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Since I am new to this news group and missed all the earlier fun on the column/row major debate, I thought I would jump in here.

> The current text (version 5.2) says the *exact* opposite, namely
> that C/Pascal etc. are column-major!!

C does not have true multi-dimensional arrays. It does fake multi-dimensional arrays however by using arrays of pointers to arrays, etc. In that sense 2-dimensional C arrays in row-major order (Ref: Harbison & AStteele, p135).

Fortran is column-major, and IDL was originally written in Fortran. I assume that this is the reason that IDL is column-major. However, since Fortran has no array arithmetic, it seems somewhat irrelevant at this point.

I had never heard of column-major arrays until I encountered it when helping my (then) 12-year old son with new math. It drove me batty then (20 years ago) and it drives me batty now when I try to do matrix arithmetic using IDL. Even my most recent text books use row-major arrays. Every formula I take from the literature must be translated to column-major format.

However, it does appear unlikely that IDL will change to row-major. I think that the only solution is to change the other 99.999% of the world :)

Subject: Re: Ohmygod, another round of column/row-major...
Posted by davidf on Wed, 03 Mar 1999 08:00:00 GMT
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Stein Vidar Hagfors Haugan (steinhh@ulrik.uio.no) writes:

> Well ... a long article.

My God, if that is not the last word on this subject
I *really* don't want to hear it! :-)

Cheers,

David

P.S. I'm going to put the whole messy discussion in an article on my web page. I figure it will have computer anthropologists scratching their heads for centuries.

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Subject: Re: Ohmygod, another round of column/row-major...
Posted by mgs on Thu, 04 Mar 1999 08:00:00 GMT
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In article <MPG.11470ba1b8e5e802989702@news.frii.com>, davidf@dfanning.com
(David Fanning) wrote:

> Stein Vidar Hagfors Haugan (steinhh@ulrik.uio.no) writes:
>
>> Well ... a long article.

Regarding the new entry in the FAQ, how about if I just list the names of
people who would be willing to explain the idea? In 1000 words or less :-)

> My God, if that is not the last word on this subject
> I *really* don't want to hear it! :-)

Why do I have this feeling of deja vu? Again?

> P.S. I'm going to put the whole messy discussion in an
> article on my web page. I figure it will have computer
> anthropologists scratching their heads for centuries.

Great idea. Actually, when I first included it in the FAQ, I dropped by
David's site looking for a condensed version. No luck. David, can you
shorten it down to about 2 lines while you're at it?

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Subject: Re: Ohmygod, another round of column/row-major...
Posted by Dr. G. Scott Lett on Thu, 04 Mar 1999 08:00:00 GMT
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Yes, Fortran does have array operations, but the concepts of 'row' and
'column' don't really apply. More to the point, Fortran has a _matrix_

operation, MATMUL, that assumes that an array is represented by a two dimensional array in column-major order. For Fortran, this means that a matrix is accessed as (row, column). Most mathematics texts and papers index matrices with subscripts in the same order.

The old standard FORTRAN's didn't have array or matrix operations, so it was up to the people designing FORTRAN matrix/linear algebra software to decide if they preferred row-major or column-major. According to the LINPACK Users' Guide, the designers of LINPACK chose column major order (they called it 'column oriented') to improve performance on 'operating systems with paging and cache memory.' The authors point out that the BLAS, upon which LINPACK was based, allow matrices to be accessed by rows instead of columns, so that a matrix could be represented by a two dimensional array, accessed as (column, row), but LINPACK works only one way. EISPACK followed the same convention as LINPACK, and most similar libraries followed this convention.

IDL is not quite Fortran, not quite C.

Flame on, brothers and sisters.

Axel vom Endt <endt@bu.edu> wrote in message
news:36DE990B.5136E2EF@bu.edu...
> Steve Scheele wrote:
>
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>> that this is the reason that IDL is column-major. However, since Fortran
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>
> Now that's a statement I cannot resist to comment on. Fortran *does*
> have array arithmetic, along with a number of nice features C is
> lacking. It does have it for nine years now, time to make the news
> heard.
>
> You are not talking about this old thing from 1977 called FORTRAN (all
> caps), are you? :-)
>
> Axel

Subject: Re: Ohmygod, another round of column/row-major...
Posted by Axel vom Endt on Thu, 04 Mar 1999 08:00:00 GMT

Steve Scheele wrote:

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Axel