Subject: Re: array operations
Posted by Spon on Wed, 12 Sep 2007 09:32:01 GMT
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On Sep 12, 9:13 am, pa...@gmx.de wrote:
> Hello,
> I have a small question to an array operation.
>
> I have a 3-dimensional array. 10x10x100 ... the first 2 dimensions
> 10x10 are spatial dimensions (so one image with 10 width with and 10
> pix height). The third dimension is the time dimension. So every
> images was acquired 100 times.
>
> What I wanted to do is now to compute the the mean of every pixel in
> time dimension.
>
> So for one special pixel (e.g. [3,3]) i would write
>
> meanpixel = mean(myarray[3,3,*])
>
> but how is it, if i would like to do this operation for every pixel in
> the spatial dimensions? I just saw a possibility with a for loop.
>
> like
> FOR j = 0, 9 DO BEGIN
>
> FOR k = 0, 9 DO BEGIN
>
> meanarray[i,j]=mean(myarray[i,j,*])
>
> ENDFOR
>
> ENDFOR
>
> This isn't a very fast possibility especially when the array goes big,
> and i have to do that operation for a full image frame which is
> 1024x1024 pixel.
>
> Is there maybe another way how to act with it? I know that IDL is very
> strong with array operations, so maybe there is any another solution,
> which maybe doesn't need the two loops. Thanks a lot for your kind
> responses.
>
> greetings
>
> martin

Hello Martin, hello list!

Apologies in advance for any glaring errors, this is my first post...

You may wish to make use of the fact that, while the 'MEAN' function has no [DIMENSIONS] keyword, the 'TOTAL' function does. Why? I'm not really sure.

e.g.:

s=size(myarray)

meandata=(TOTAL(myarray,3,/NAN) / s(3))

I'm not sure this is any faster, but I suspect so. Another thing you might consider if you've got large datasets of floating points, is to bytescale (BYTSCL) your data first; I guess it depends how important your raw absolute data are to you, or if you're looking at relative rather than absolute values and can afford to shrink down your dataset before you begin juggling with it.

Also, not directly related, but worth a careful read or 16: J. D. Smith's amazing dimension juggling tutorials:
http://www.dfanning.com/tips/rebin_magic.html
http://www.dfanning.com/tips/array_concatenation.html

plus, of course, anything and everything written by the brilliant Dave Fanning without whom I'd still be trapped in a FOR loop myself :-)

Hope this helps,

Chris

PS I tried playing around with the PRESERVE_TYPE keyword, but just like the helpfile predicted I got wild overflows and complete gibberish in the output (my raw data is currently single-precision float).