Subject: matrix multiplication
Posted by c1dje on Mon, 22 Mar 1993 22:51:48 GMT
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I am trying to apply a list of rotation matrices to a matching list
of vectors, i.e. a vector of three-vectors and a vector of 3x3 matrices. I
can correctly apply a rotation matrix between a vector and a matrix, but
now the vector is a list of vectors and the matrix is a list of matrices.
I could handle all of this with a "for" loop, but that is inefficient in
IDL; I would like IDL to loop over all of the indices internally. My
problem is creating the rotation matrix with the proper ordering for matrix
multiply (#).
Previously I multiplied a 3-vector by a 3x3 matrix:

[v1,v2,v3] # [[a1,a2,a3],[a4,a5,a6],[a7,a8,a9]]

but now all of the variables are vectors (of matching length) so V is Nx3
and A is Nx3x3. I can transpose V so that it is 3xN but IDL requires the
argument of transpose to be 1D or 2D, not 3D as the rotation matrix
appears. How do I generate the 3x3xN matrix from nine vectors of length N?
Will this collective matrix multiply even work as I expect?

David
==========
==========
David Edelsohn T.J. Watson Research Center
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+1 914 945 3011 (Tieline 862) Yorktown Heights, NY 10598
"The Church doesn't have problems with sex; the world does" -- Vatican official
"A good theory should fit on a T-shirt" -- Astronomer at Jan 1992 AAS meeting

Subject: Re: Matrix multiplication
Posted by Haje Korth on Fri, 14 Nov 2003 17:48:11 GMT
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The nice thing about IDL is that it is sooo hands-on. Just try it yourself
with a small matrix and check the result by hand:
a=indgen(3,3)
b=[1,2,3]
print,a#b
print,a##b

It's not that hard and definitely faster than waiting for a newsgroup
response.
(Most likely you wanted a##b)

Cheers,

Haje

"jhkim" <planets@dreamwiz.com> wrote in message
news:7652fb5d.0311140809.58ae466@posting.google.com...
> A and B are matrices
> How can I write an IDL expression for A * B (matrix multiplication)in
> mathematics(linear algebra). Which is right, A#B or A##B? I think A##B
> is right....
>
> Thank you.
>
> Best regards!

Subject: Re: matrix multiplication
Posted by David Fanning on Tue, 28 Oct 2008 18:42:04 GMT
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russ writes:

> Probably a stupid question but I haven't used idl for a while
>
> Is there a quicker way of doing this?
>
> a=fltarr(1000,20)
> b=fltarr(20)
>
> for i=0,999 do begin
> a(i,*)=a(i,*)*b
> endfor

It might be faster to realize the end result is going
to be an array of zeros than it would be to actually
write the code. :-)

But, I think you want this:

```
a = a * rebin(reform(b, 1, 20) ,1000, 20)
```

Cheers,

David
--
David Fanning, Ph.D.
Coyote's Guide to IDL Programming (www.dfanning.com)
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: matrix multiplication
Posted by Chris[6] on Tue, 28 Oct 2008 20:59:51 GMT
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On Oct 28, 8:42 am, David Fanning <n...@dfanning.com> wrote:
> russ writes:
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> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

I also like this shortcut for reform:
a = a * rebin(1#b, 1000, 20)

chris

Subject: Re: matrix multiplication
Posted by russ[1] on Tue, 28 Oct 2008 21:32:46 GMT
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On 28 Oct, 20:59, Chris <beaum...@ifa.hawaii.edu> wrote:
> On Oct 28, 8:42 am, David Fanning <n...@dfanning.com> wrote:
>
>
>
>

>> russ writes:
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>
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>
> chris

many thanks to you both

Russ

Subject: Re: matrix multiplication
Posted by Vince Hradil on Wed, 29 Oct 2008 02:17:01 GMT
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On Oct 28, 1:42 pm, David Fanning <n...@dfanning.com> wrote:
> russ writes:
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> David
> --
> David Fanning, Ph.D.
> Coyote's Guide to IDL Programming (www.dfanning.com)
> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Cool - I would have definitely thrown in a TRANSPOSE...
i.e. a = a * transpose(rebin(b,20,1000)), but your way has to be
faster - I'm not in front of my IDL machine so I can't check it.

Vince

P.S. what is it with me and speed these days?
