Subject: Re: matrix division
Posted by David Fanning on Wed, 21 May 2008 18:35:44 GMT
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adam.ranson@bris.ac.uk writes:

> I have a question about IDL 5.6 which I'm pretty new to... I seem to
> remember having a similar problem in MatLab a while back too. I'm
> trying to divide each of the elements in a 2D array by the elements in
> 2nd 2D array of identical dimensions and put the result into 3rd
> array. Is it possible to do this in one statement in IDL or do I have
> to go through each item using a loop?

I would try something like this:

```
IDL> c = a / b
```

Cheers,

David

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

Subject: Re: matrix division
Posted by adam.ranson on Thu, 22 May 2008 08:07:29 GMT
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Thanks for the quick response David! This is the way I'd
assumed it would be done but doesn't give me the numbers
back I'd expect. For example:

```
I = [[1, 2, 2],[2,1,1]]
C = [[8, 2, 8],[2,8,1]]
Z = I/C
```

IDL> print, z gives...

```
      0       1       0
      1       0       1
```

I want to divide 1 by 8, 2 by 2, 2 by 8, 2 by 2, 1 by 8 & 1 by 1.

Thanks again

Adam

On 21 May, 19:35, David Fanning <n...@dfanning.com> wrote:
> adam.ran...@bris.ac.uk writes:
>> I have a question about IDL 5.6 which I'm pretty new to... I seem to
>> remember having a similar problem in MatLab a while back too. I'm
>> trying to divide each of the elements in a 2D array by the elements in
>> 2nd 2D array of identical dimensions and put the result into 3rd
>> array. Is it possible to do this in one statement in IDL or do I have
>> to go through each item using a loop?
>
> I would try something like this:
>
> IDL> c = a / b
>
> Cheers,
>
> David
>
> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
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> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: matrix division
Posted by Nigel Wade on Thu, 22 May 2008 10:00:07 GMT
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adam.ranson@bris.ac.uk wrote:

>
> Thanks for the quick response David! This is the way I'd
> assumed it would be done but doesn't give me the numbers
> back I'd expect. For example:
>
> I = [[1, 2, 2],[2,1,1]]
> C = [[8, 2, 8],[2,8,1]]
> Z = I/C
>
> IDL> print, z gives...
> 0 1 0
> 1 0 1
>
> I want to divide 1 by 8, 2 by 2, 2 by 8, 2 by 2, 1 by 8 & 1 by 1.

You have done.

But maybe what you really want to do is divide 1.0 by 8.0, etc...

--
Nigel Wade

Subject: Re: matrix division
Posted by d.poreh on Thu, 22 May 2008 10:07:41 GMT
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On May 22, 12:00 pm, Nigel Wade <n...@ion.le.ac.uk> wrote:
> adam.ran...@bris.ac.uk wrote:
>
>> Thanks for the quick response David! This is the way I'd
>> assumed it would be done but doesn't give me the numbers
>> back I'd expect. For example:
>
>> I = [[1, 2, 2],[2,1,1]]
>> C = [[8, 2, 8],[2,8,1]]
>> Z = I/C
>
>> IDL> print, z gives...
>> 0 1 0
>> 1 0 1
>
>> I want to divide 1 by 8, 2 by 2, 2 by 8, 2 by 2, 1 by 8 & 1 by 1.
>
> You have done.
>
> But maybe what you really want to do is divide 1.0 by 8.0, etc...
>
> --
> Nigel Wade

hi
how we can avoid dividing by zero?in matlab we use *eps* what about
IDL?
Cheers
Dave

Subject: Re: matrix division
Posted by adam.ranson on Thu, 22 May 2008 11:41:49 GMT
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On 22 May, 11:00, Nigel Wade <n...@ion.le.ac.uk> wrote:

> adam.ran...@bris.ac.uk wrote:
>
>> Thanks for the quick response David! This is the way I'd
>> assumed it would be done but doesn't give me the numbers
>> back I'd expect. For example:
>
>> I = [[1, 2, 2],[2,1,1]]
>> C = [[8, 2, 8],[2,8,1]]
>> Z = I/C
>
>> IDL> print, z gives...
>> 0 1 0
>> 1 0 1
>
>> I want to divide 1 by 8, 2 by 2, 2 by 8, 2 by 2, 1 by 8 & 1 by 1.
>
> You have done.
>
> But maybe what you really want to do is divide 1.0 by 8.0, etc...
>
> --
> Nigel Wade

Oh right I see what's happening now! How can I force it to use a
floating point (?) data type then?

Sorry for the dumb questions, the manual/online I got with my copy
seems
to be very unhelpful to me!

Best wishes and thanks for your time

Adam

Subject: Re: matrix division
Posted by David Fanning on Thu, 22 May 2008 12:08:33 GMT
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d.poreh@gmail.com writes:

> how we can avoid dividing by zero?in matlab we use *eps* what about
> IDL?

I think, in this situation with integers:

```
IDL> eps = (Machar()).eps
IDL> c = Float(a) / (b > eps)
```

It would be slightly more complicated with floats, and I haven't
had my coffee yet.

Cheers,

David
--
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Subject: Re: matrix division
Posted by David Fanning on Thu, 22 May 2008 12:13:08 GMT
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adam.ranson@bris.ac.uk writes:

> Thanks for the quick response David! This is the way I'd
> assumed it would be done but doesn't give me the numbers
> back I'd expect. For example:
>
> I = [[1, 2, 2],[2,1,1]]
> C = [[8, 2, 8],[2,8,1]]
> Z = I/C
>
> IDL> print, z gives...
> 0 1 0
> 1 0 1
>
> I want to divide 1 by 8, 2 by 2, 2 by 8, 2 by 2, 1 by 8 & 1 by 1.

Well, this is integer division, so this is what you hope
will happen, given the rules of integer division. If you
want something else, try this:

```
IDL> c = Float(a) / b
```

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
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Subject: Re: matrix division
Posted by d.poreh on Thu, 22 May 2008 12:24:40 GMT
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> I think, in this situation with integers:
>
> IDL> eps = (Machar()).eps
> IDL> c = Float(a) / (b > eps)
>
> It would be slightly more complicated with floats, and I haven't
> had my coffee yet.
>
> Cheers,
>
> David
> --
> David Fanning, Ph.D.
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b>eps??? but 0<eps!!!!!!
Cheers,

Subject: Re: matrix division
Posted by David Fanning on Thu, 22 May 2008 12:29:51 GMT
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d.poreh@gmail.com writes:

> b>eps??? but 0<eps!!!!!!

Lo siento. Habla Ingles?

Cheers,

David
--
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Fanning Software Consulting, Inc.
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Subject: Re: matrix division
Posted by d.poreh on Thu, 22 May 2008 12:40:22 GMT
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On May 22, 2:29 pm, David Fanning <n...@dfanning.com> wrote:
> d.po...@gmail.com writes:
>> b>eps??? but 0<eps!!!!!!
>
> Lo siento. Habla Ingles?
>
> Cheers,
>
> David
> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
> Coyote's Guide to IDL Programming:http://www.dfanning.com/
> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Sorry!!! Yes as you mentioned above b> eps but 0<eps. Doesn't it? I
mean how we can reach something like b/0=b/eps???
Cheers

Subject: Re: matrix division
Posted by jameskuyper on Thu, 22 May 2008 12:42:39 GMT
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David Fanning wrote:
> d.poreh@gmail.com writes:
>
>> how we can avoid dividing by zero?in matlab we use *eps* what about
>> IDL?
>
> I think, in this situation with integers:
>
> IDL> eps = (Machar()).eps
> IDL> c = Float(a) / (b > eps)

What if b is < 0?

Subject: Re: matrix division
Posted by jameskuyper on Thu, 22 May 2008 12:47:10 GMT
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d.poreh@gmail.com wrote:
>> I think, in this situation with integers:

>>
>> IDL> eps = (Machar()).eps
>> IDL> c = Float(a) / (b > eps)
...
> b>eps??? but 0<eps!!!!!!

Hint: In IDL, "b > eps" means something quite different from "b gt eps".
Understand that difference, and the code makes a little more sense.

Subject: Re: matrix division
Posted by David Fanning on Thu, 22 May 2008 12:55:52 GMT
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James Kuyper writes:

> What if b is < 0?

I was hoping you would tell me, so I didn't have to
think about it anymore. :-(

Cheers,

David
--
David Fanning, Ph.D.
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Subject: Re: matrix division
Posted by David Fanning on Thu, 22 May 2008 12:59:33 GMT
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d.poreh@gmail.com writes:

> Sorry!!! Yes as you mentioned above b> eps but 0<eps. Doesn=92t it? I
> mean how we can reach something like b/0=3Db/eps???

If you divide by zero you get positive or negative
infinity. If you divide by something very close to
zero, you get a very big number, but not infinity.
In code, it is better to have a very big number rather
than an INF. This just makes sure get a big number.

Cheers,

David
--
David Fanning, Ph.D.
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Subject: Re: matrix division
Posted by jameskuyper on Thu, 22 May 2008 14:57:51 GMT
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David Fanning wrote:
> James Kuyper writes:
>
>> What if b is < 0?
>
> I was hoping you would tell me, so I didn't have to
> think about it anymore. :-(

For the integer case:

ratio = numerator/denominator
bad = WHERE(denominator eq 0, count)
IF count gt 0 THEN ratio[bad] = replacement_value

replacement_value needs to be carefully chose for the context of your problem. You might want to give different replacement values depending upon whether the numerator is positive, negative, or 0. There's probably a more elegant approach, but three different WHERE's would certainly be sufficient to cover those cases.

For the floating point case, IDL fills in the relevant elements of ratio with -Inf, Nan, or Inf, depending upon the sign of the numerator, and I can't think of any better way of handling it than to use precisely those value. If you need to use your result for further computations where those values would be unacceptable, replace them, with logic similar to the above, but using the FINITE() function.
