Subject: Re: failed matrix inversion returns input-- interesting
Posted by marc schellens[1] on Fri, 14 Jul 2006 07:09:21 GMT
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Ed Hyer wrote:
> Can someone explain this behavior?
> IDL> testm=[[0,0,0,0],[0,1,0,0],[0,0,1,0],[0,0,0,1]]
> IDL> testmi=invert(testm,status)
> IDL> print,status; 0=success, 1=fail, 2=pivot used
> 1
> IDL> print,testmi
> 0.00000 0.00000 0.00000 0.00000
> 0.00000 1.00000 0.00000 0.00000
> 0.00000 0.00000 1.00000 0.00000
> 0.00000 0.00000 0.00000 1.00000
>
> Is there any reason in creation why IDL simply copies the input into
> the output if it cannot do the inversion? That seems, well, malevolent,
> unless I'm missing something.

Well, what do you suggest is better?

Marc

Subject: Re: failed matrix inversion returns input-- interesting
Posted by Bringfried Stecklum on Fri, 14 Jul 2006 07:14:20 GMT
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Ed Hyer wrote:
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> IDL> testm=[[0,0,0,0],[0,1,0,0],[0,0,1,0],[0,0,0,1]]
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>
> Is there any reason in creation why IDL simply copies the input into
> the output if it cannot do the inversion? That seems, well, malevolent,
> unless I'm missing something.
>
I would not call this behavior malevolent. For a singular matrix the
inversion is invalid. So the result is meaningless anyway and it does
not matter whether IDL returns a fictious array or the input matrix.

When solving linear equations it is always recommended to check the condition number of the matrix using cond and use singular value decomposition in case of an ill-behaved matrix.

regards,

B.St.

File Attachments

1) stecklum.vcf, downloaded 132 times

Subject: Re: failed matrix inversion returns input-- interesting
Posted by mmeron on Fri, 14 Jul 2006 07:30:57 GMT
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In article <1152860961.931059.317520@35g2000cwc.googlegroups.com>,
"m_schellens@hotmail.com" <m_schellens@hotmail.com> writes:
>
> Ed Hyer wrote:
>> Can someone explain this behavior?
>> IDL> testm=[[0,0,0,0],[0,1,0,0],[0,0,1,0],[0,0,0,1]]
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>> Is there any reason in creation why IDL simply copies the input into
>> the output if it cannot do the inversion? That seems, well, malevolent,
>> unless I'm missing something.
>
> Well, what do you suggest is better?
>
Well, nearly anything would be better.

I've a routine, called SVD_INVERT, which returns a regular inverse
when one exists, else it returns and inverse in the "SVD sense".
Would the IDL routine have been doing this, that would be fine (though
it should've been documented). But, it is not doing this either.
So IMO, it would've been preferable to return an array of NANs in such
case.

Mati Meron | "When you argue with a fool,
meron@cars.uchicago.edu | chances are he is doing just the same"

Subject: Re: failed matrix inversion returns input-- interesting
Posted by news.verizon.net on Fri, 14 Jul 2006 12:23:54 GMT
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> Is there any reason in creation why IDL simply copies the input into
> the output if it cannot do the inversion? That seems, well, malevolent,
> unless I'm missing something.

One reason you might want this behaviour is to preserve the original array, in cases where the code overwrites the inverse

```
IDL> testm = invert(testm, status)
IDL> if status EQ 1 then print,'Singular Matrix ', testm
```

If INVERT returned, say, NaN values or an undefined variable (the only reasonable alternatives I think), then you would have lost the original array

Incidentally, the LAPACK (LU Decomposition) invert routine LA_INVERT in IDL has the same behavior. ---Wayne