Subject: Re: derivative function in IDL similar as DIFF in matlab
Posted by Jie Zhou on Tue, 12 Nov 2013 12:18:01 GMT
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On Tuesday, November 12, 2013 1:08:10 PM UTC+1, Matthew Argall wrote:
> On Tuesday, November 12, 2013 7:01:15 AM UTC-5, Matthew Argall wrote:
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>> On Tuesday, November 12, 2013 5:08:11 AM UTC-5, Jie Zhou wrote:
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>>> Is there a derivative function in IDL similar as DIFF in matlab? I think the DERIV is different from DIFF.
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>
>> TS_DIFF(data, 1) would be equivalent.
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>
> Actually, maybe not. TS_DIFF calculates the forward difference. I think you are looking for the backward difference.
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>
> In that case, I tend to use
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>
> result = data[1:*] - data[0:n_elements(data)-1]
>
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>
> or
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>
> result = shift(data, 1) - data
>
> result = result[0:n_elements(result)-1]

In fact what I tried to do is using diff function to calculate the n-th derivative of an 2-d matrix. for example, for a matrx:
A=

1	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	1	0	0	0
0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0	0	1

in matlab, the DIFF(A,2) gives:

1	-2	1	0	0	0	0	0	0	0
0	1	-2	1	0	0	0	0	0	0
0	0	1	-2	1	0	0	0	0	0
0	0	0	1	-2	1	0	0	0	0
0	0	0	0	1	-2	1	0	0	0
0	0	0	0	0	1	-2	1	0	0
0	0	0	0	0	0	1	-2	1	0
0	0	0	0	0	0	0	1	-2	1

Until now, I don't find a equivalent function in IDL.
Thanks to alx, I use
D=(shift(shift(A,0,1)-A,0,1)-(shift(A,0,1)-A))[*,2:*]
to finish the task.

jie
