Subject: Re: interpolate weirdness
Posted by Helder Marchetto on Fri, 21 Feb 2014 14:06:08 GMT
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On Friday, February 21, 2014 2:59:46 PM UTC+1, Helder wrote:
> On Friday, February 21, 2014 1:33:45 PM UTC+1, Helder wrote:
>
>> On Friday, February 21, 2014 1:00:36 PM UTC+1, CR wrote:
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>>> Hi Folks,
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>>> I know that there is no 'correct' way for interpolation, but maybe a 'best' IDL way. The following example easily demonstrates what I mean:
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>
>>> IDL> d=dist(20) & print,interpolate(d,[.5],[.5],/grid)
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>
>>>   0.853553
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>>> IDL> print,interpolate(d,[.5],[.5],/grid,/cubic)
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>>>   0.622236
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>>> IDL> print,interpolate(d,[.400544],[.400544],/grid)
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>>>   0.707107
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>>> IDL> print,interpolate(d,[.581946],[.581946],/grid,/cubic)
>
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>>>   0.707107
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>>> IDL> print,'The result should be: ',sqrt(.5)
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>>> The result should be: 0.707107
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>>> It does not play a role which IDL version is used - for IDL 6.4 and for IDL 8.3 I got the same results. Is there any way to get 'closer' to a reasonable result?
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>>> Thanks and Cheers
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>>> Chris
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>> I'm not sure what you're trying to do here, but interpolating near borders is kind of complicated because you can only have one side to rely on. However, if you're going to use bicubic interpolation, I would recommend using:
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>
>> print,interpolate(d,[.5],[.5],/grid,cubic=-0.5)
>
>>
>
>> then you get:
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>>
>
>> 0.738791
>
>>
>
>> Hope it helps,
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>> h
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>
> Just for sake of comparison, if you do the same for a point not next to the boundary, you get:

>
> print,interpolate(d,[5.5],[5.5],/grid, cubic=-0.5)
>
>   7.77795
>
> print, sqrt(2)*5.5
>
>   7.77817
>
> The difference is 0.00022220612, what is much better.
>
>
>
> Hope it helps.

One more commment about the bilinear interpolation:
IDL> d=dist(20) & print,interpolate(d,[.5],[.5],/grid)
    0.853553

The value 0.853553 is excately what is expected!
Linear interpolation on x gives 0.5 and (1+sqrt(2))/2=2.414, then take the average of those two values and you get:
IDL> (0.5+(1.0+sqrt(2))/2.0)/2.0
     0.85355341
Correct answer. See http://en.wikipedia.org/wiki/Bilinear_interpolation

Cheers,
Helder