Subject: Re: A problem using IDL?
Posted by R.G. Stockwell on Fri, 02 May 2008 16:16:52 GMT
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<chihuyu@sohu.com> wrote in message
news:337cf67f-424c-4bd8-8340-7ec7d0a121a5@l25g2000prd.google groups.com...
> I used idl to write the following:
>
> window,xsize=800,ysize=400
> min=0
> max=100
> n=200
> x=fltarr(n+1)
> for i=0,n do x[i]=min+double(i)*(max-min)/n
> print,x
> y=sin(2*3.141593*x)
> plot,x,y
>
> When n=100 or n=200,the graph is wrong. When n >=300,it's OK.Can
> someone tell me why?

You are aliased. Definitely read up on it if you are not familiar with aliasing, as it is quite important in spectral analysis. Also read up on nyquist frequency.

you can write a sinusoid as

y = sin(2*!Pi*f/length*x)

to explicitly have your frequency in there.

Also, check out this code which explicitly shows the aliasing.

window,xsize=800,ysize=400
min=0
max=100
n=100
x=fltarr(n+1)
for i=0,n do x[i]=min+double(i)*(max-min)/n
;print,x
y=sin(2*3.141593*x)

!P.multi=[0,1,2]

```
plot,x,y,psym=-4,xr=[0,10]
x1 = x
y1 = y



n=500
x=fltarr(n+1)
for i=0,n do x[i]=min+double(i)*(max-min)/n
;print,x
y=sin(2*3.141593*x)


plot,x,y,psym=-4,xr=[0,10]
oplot,x1,y1,psym=6,thick=4
```
