Subject: Re: autocorrelation help
Posted by on Fri, 25 Jan 2013 23:03:54 GMT
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On Friday, January 25, 2013 10:52:50 PM UTC+1, Kat wrote:
> Hey guys,
>
> I'm trying to run an autocorrelation on a 2D plot and it is giving me way crazy/bad results. Seems simple enough, but it doesn't seem to be giving me what I should be expecting. I ran the following simple example below:
>
>
>
> a=indgen(100)*.2-2
>
> b=sin(a)
>
> lag=[-7,-6,-5,-4,-3,-2,-1, 1.0,2,3,4,5,6,7]
>
>
>
>
>
> Here are the values in column form for easy viewing:
>
>
>
> ENVI> print, transpose(lag)
>
> -7.00000
>
> -6.00000
>
> -5.00000
>
> -4.00000
>
> -3.00000
>
> -2.00000
>
> -1.00000
>
> 1.00000
>
> 2.00000
>
> 3.00000

>
>   4.00000
>
>   5.00000
>
>   6.00000
>
>   7.00000
>
>
>
> ENVI> print, transpose(autocorr)
>
>   0.777030
>
>   0.808242
>
>   0.839966
>
>   0.872025
>
>   0.904238
>
>   0.936422
>
>   0.968397
>
>   0.968397
>
>   0.936422
>
>   0.904238
>
>   0.872025
>
>   0.839966
>
>   0.808242
>
>   0.777030
>
>
>
> I may be mistaken, but in this instance I have three "sin" type curves which repeat roughly every 6 units. So for lag 6ish, the autocorrelation value should be going back up close to 1-ish. Yet this doesn't seem to be the case in my code.
>
> Can someone help explain to me why this is not working? And hopefully suggest some way to

make it work?
>
> Thanks guys!

Several issues here.

First, I don't know what [a,b] is doing in that call. I assume you meant to calculate the autocorrelation of b:

autocorr=a_correlate(b, lag)

Second, sure a sine repeats after 2*!pi = 6 but your sampling is in steps of 0.2, so the sine repeats after 5*2*!pi = 31 array elements so your lag vector is too short for you to see the second peak.

Third, that second peak will be rather attenuated because 31 is a significant part of 100 (the number of elements in your array), so you may want to try this instead:

```
a=indgen(1000)*.2-2
b=sin(a)
lag=indgen(40)
autocorr=a_correlate(b, lag)
print,autocorr
```

The result is:

```
      1.00000     0.979339     0.919713     0.823575     0.694829     0.538665
     0.361360     0.170019   -0.0277101    -0.223938    -0.410852    -0.581026
    -0.727717    -0.845127    -0.928641    -0.975000    -0.982433    -0.950722
    -0.881211    -0.776744    -0.641553    -0.481085    -0.301784    -0.110828
    0.0841515     0.275381     0.455253     0.616624     0.753107     0.859314
     0.931081     0.965615     0.961622     0.919338     0.840526     0.728402
     0.587498     0.423488     0.242950    0.0531106
```

And you can see the second peak at a lag of about 30 elements. Plot autocorr vs the 0.2 sampling and the peak will show up at 2*!pi as it should.