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
>
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> 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.
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> 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.

Subject: Re: autocorrelation help
Posted by Oana Coman on Fri, 25 Jan 2013 23:38:23 GMT
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On Friday, January 25, 2013 5:03:54 PM UTC-6, Mats Löfdahl wrote:
> On Friday, January 25, 2013 10:52:50 PM UTC+1, Kat wrote:
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>>
>
>>     -1.00000
>
>>
>
>>      1.00000
>
>>
>
>>      2.00000
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>>
>
>>      3.00000
>
>>
>
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Oh! I was confused about what lag actually was.
That makes more sense. Thanks!