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:
>
>> 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.

Oh! I was confused about what lag actually was.
That makes more sense. Thanks!