
Subject: Sum along diagonals

Posted by [mole6e23](#) on Fri, 25 Aug 2000 07:00:00 GMT

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Hi there..

I thought I'd ask this question, more out of curiosity as to a possible result than for really needing to optimize it (this code is used approximately three times for every blue moon). I'm always impressed with some of the results from this group, most recently:

```
a=a[* ,where(histogram(b,MIN=0,MAX=(size(a,/DIMENSIONS))[1]-1 ,BINSIZE=1) eq 0)]
```

I wouldn't have thought of compacting all that into one line!

Every once in a while (not often enough to make me worry about optimizing too much), I want to take a not necessarily square matrix and get the sum along the diagonals, such as the following, with the theoretical function `sum_diag`:

```
IDL> blah = indgen( 4, 4 )
IDL> print, blah
  0   1   2   3
  4   5   6   7
  8   9  10  11
 12  13  14  15
IDL> print, sum_diag( blah )
  0   5  15  30  30  25  15
```

which is the series [0, 4+1, 8+5+2, 12+9+6+3, ...]

Of course, to be difficult, I'd like it to work for non-square matrices as well:

```
IDL> blah = indgen( 5, 3 )
IDL> print,blah
  0   1   2   3   4
  5   6   7   8   9
 10  11  12  13  14
```

and the result would be the series [0, 5+1, 10+6+2, 11+7+3, ...]

The best I've found is to count the diagonals, loop through those, and then loop again through the possible row and column indices in that array. It's pretty ugly, and very time consuming for a 512x512 array (most of what I want). It just occurred to me now that for the square matrix, you could take "`blah + transpose( blah )`" and now you only have to worry about the lower half of the matrix (and the doubled diagonal elements), so it might be a bit better, but still messy.

So if you're bored, I'd love to see a better solution than a bunch of long, nested loops, even if just only for the square case (since that is 90% of the cases in my data)

Enjoy!
Todd

Subject: Re: Sum along diagonals
Posted by [Craig Markwardt](#) on Mon, 28 Aug 2000 07:00:00 GMT
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colinr@toliman.uio.no (Colin Rosenthal) writes:

> On Fri, 25 Aug 2000 17:57:01 -0700,
> Todd Clements <mole6e23@hotmail.com> wrote:
>> craigmnet@cow.physics.wisc.edu wrote:
>>> How about this solution. It's not a one-liner, and it uses two loops,
>>> [snip]
>>
>> That works just fine! Once again, I am duly impressed. I'm sure it took me
>> longer to figure out your code than it did for you to write it! Absolutely
>> amazing. Having read this newsgroup for a while, I'm beginning to wonder
>> if there is an IDL question you can't answer.
>
> Can he write a Stein-Vidar emulator in IDL? Or maybe David could write a
> Craig emulator?

Actually Stein-Vidar is at Goddard where I work too [in case people didn't know.] I made a promise long ago to meet him for lunch, but never did. I guess now's my chance to collect data on that emulator...

Craig

--

Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
