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 occured to me now that for the squre 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