Subject: Matrix operations with IDL: Avoiding for loops
Posted by vince33600 on Wed, 30 Dec 2015 00:57:26 GMT
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Dear all,

I was trying to improve the performance of some pieces of code that are taking forever to run. Basically, I'm trying to multiply a set of n matrix (3x3) by a set of n vectors (3x1) without using any for loops. The results of these operations should give me a set of n vectors (3x1).

Let's take a simplified example where n=2. Therefore, I have 2 matrixes (let's call them a and b) that needs to be multiplied to 2 vector (let's call them u and v).

I figured out that the operation could be done by reshaping (using rebin and reform for instance) the matrixes into a bigger array (let's call it M) whose diagonal elements are the a and b matrixes, so that:

M = | a 0 |
    | 0 b |

where a and b are the 3x3 matrixes, and by reshaping the n vectors into in single vector (called I), so that:

I = | u |
    | v |

Then, the results would be:
R = M.I

Finally, the n vectors would be obtained by reshaping the R vector into n (3x1) vector.

Coming for fortran, I initially coded that by decomposing every single matrix multiplication in a for loop. I then tried to apply the above solution, but it seems a real stretch for me to do it without any loops.

I was thinking that someone already might have faced that problem.

Thanks for your help!
Vincent