Subject: Inverting banded-block matrices.
Posted by James Kuyper on Thu, 28 Aug 2003 23:07:57 GMT
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I've got a problem where I have to calculate g = C D^-1 f, where g and f are vectors, and C and D are matrices. C has m by m blocks, each of which is itself an n by n matrix. It is banded, with k non-zero co-diagonals above and below the main diagnal, both at the block level and within each block. C[i,j] ge 0. Every statement I've made about C also applies to D.
For the sake of definiteness, m=10, n=1354, k = 3.

This seems like it should be a pretty common type of matrix structure for problems involving 2-D grids. I could solve this by explicitly inverting a m*n by m*n matrix. However, I would assume that there are existing routines somewhere which can take good advantage of the sparseness of these matrices to speed up the calculations considerably. Could anyone point me at such routines?