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8.3.2 But...

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8.3.2 But...

No video for this unit.

Reading Assignment

0 points possible (ungraded)
Read Unit 8.3.2 of the notes. [\[LINK\]](#)

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Discussion

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Inverse of a general matrix

Ironically, one of the instructors of this course has written a paper about high-performance inversion of a matrix, which was then published by a top journal:


Xiaobai Sun, Enrique S. Quintana, Gregorio Quintana, and Robert van de Geijn.
A Note on Parallel Matrix Inversion.
SIAM Journal on Scientific Computing, Vol. 22, No. 5, pp. 1762-1771.
Available from <http://www.cs.utexas.edu/users/flame/pubs/SIAMMatrixInversion.pdf>.
(This was the first journal paper in which the FLAME notation was introduced.)

The algorithm developed for that paper is a blocked algorithm that incorporates pivoting that is a direct extension of the algorithm we introduce in Unit 8.2.5. It was developed for use in a specific algorithm that required the explicit inverse of a general matrix.

Inverse of a symmetric positive definite matrix

Inversion of a special kind of symmetric matrix called a symmetric positive definite (SPD) matrix is sometimes needed in statistics applications. The inverse of the so-called covariance matrix (which is typically a SPD matrix) is called the precision matrix, which for some applications is useful to compute. We talk about how to compute a factorization of such matrices in this week's enrichment. If you go to wikipedia and seach for precision matrix" you will end up on this page: [Precision \(statistics\)](#), that will give you more information. We have a paper on how to compute the inverse of a SPD matrix:

Paolo Bientinesi, Brian Gunter, Robert A. van de Geijn.

 Calculator

Families of algorithms related to the inversion of a Symmetric Positive Definite matrix.

ACM Transactions on Mathematical Software (TOMS), 2008

Available from <http://www.cs.utexas.edu/~flame/web/FLAMEPublications.html>.

Welcome to the frontier!

Try reading these papers (as an enrichment)! You will find the notation very familiar.

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