Wed. 05/23/12:

HW 7: received from 2 teams very late

Serious problem: Each caption must say, on which hardware you ran!

References: for book, must give publisher

Pacheco: Morgan Kaufmann

Matlab: CG must be able to fit into memory, if Gaussian elimination does!

Description of cluster: Since it is changing all the time and we have little information, I would suggest to say:
"In the IT Services-room, we used X nodes with......
and Y nodes with ____"

Webpage for BLAS and a lot of math. software is
www.netlib.org

We looked at blas there and specifically at
ddot.f = double precision dot product

Like many BLAS, it allows for increments to be chosen other than 1. But what for?
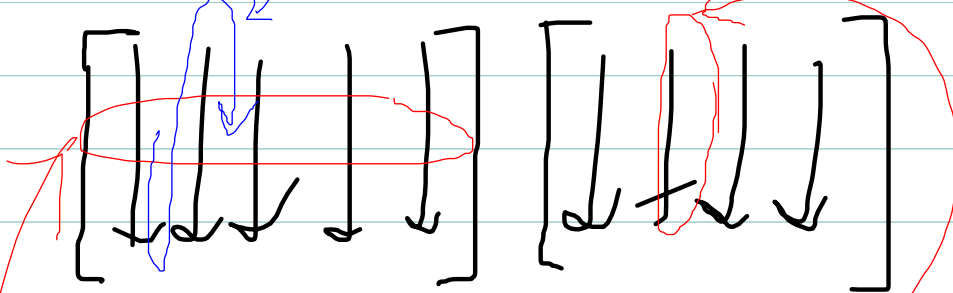
Recall problem of computing $C = AB$
for $A, B, C \in \mathbb{R}^{n \times n}$. Dot product version:

```
for (j = 0; j < n; j++) {
   for (i = 0; i < n; i++)    {
        C[i + n*j] = ddot(n, &(A[i]), n, &(B[n*j], 1)
```

We need dot product of a <u>row</u> of A and a column of B
But A and B are both column-major ordering!

increment = n

incremt = 1

$\&(A[i + n*0])$ $\&(B[0 + n*j])$

LAPACK is based on BLAS.

Then, a MPI-based parallel ScaLAPACK is
based on BLAS, LAPACK, and BLA<u><u>C</u></u>S
= basi<u>c</u> ... communication subprograms
——▷ All of this is for <u>dense</u> matrices ——▷ Ch. 15