Assignment 1

Write C programs implementing the following three algorithms of multiplication of two n×n dense matrices:

1) Straightforward non-blocked ijk algorithm.
2) Blocked ijk algorithm using square b×b blocks.
3) Blocked kij algorithm using square b×b blocks.

Experiment with the programs and build/plot:

1) The dependence of the execution time of each program on the matrix size n and the block size b .
2) The speedup of the blocked algorithms over the non-blocked one as a function of the matrix size and the block size.
3) Compare the fastest program with the BLAS/ATLAS routine dgemm implementing the same operation.

Explain the results.

Variants of the assignment:

1) Multiplication of matrix blocks in the implementation of the blocked ijk algorithm:
      a. manually written
      b. BLAS calls
      c. ATLAS calls
2) Multiplication of matrix blocks in the implementation of the blocked kij algorithm:
      a. manually written
      b. BLAS calls
      c. ATLAS calls
3) Comparison with BLAS/ATLAS routine;
      a. BLAS
      b. ATLAS