Automatic Generation and Analysis of Algorithms
Assignment #4

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Matrix-matrix product

Operation:

$C := C + AB$

Setup:

- $A \in \mathbb{R}^{8\times 8}$, $B \in \mathbb{R}^{8\times 40}$, and $C \in \mathbb{R}^{8\times 40}$.
- The matrix is stored by columns.

Goal:

Automatic generation of implementations.

What to do

1) Initialize A, B and C with single precision random floating point numbers.

2) Vectorize with intrinsics the building blocks of size (up to) 4 -by hand-.

3) Write a program (in any language) that generates at least 10 different C vectorized implementations for the given product.

4) For each implementation,
   -verify the result (BLAS)
   -measure the execution time
   -compare the execution time with an optimized BLAS

5) Submit a report containing your automation strategy (where do these implementations come from?), a performance comparison and the winning implementation.

Submission

- Individual assignment.
- Submission by email to `pauldj@aices.rwth-aachen.de`
- Email's subject: ‘`AGAA-14 HW4 your_last_name`’
- Submit both your generator and the generated implementations. Submit your Makefile and all the files necessary to execute the generator.
- Make sure everything executes correctly.
- Indicate your name inside each file.
- Submit an archive: `your_name.zip` or `your_name.tgz`
- **Deadline: oral exam**