SPhotmk

Summary Version

1.0

Purpose of Benchmark

Confirm correct single CPU result and measure single CPU performance.

Characteristics of Benchmark

Executes on a single CPU. The code is fortran77. The code is compact, does not use MPI or OMP, has no arguments, does not read any files, and only prints the final result. Therefore, among other uses, it is suitable for hardware simulators and early hardware functionality tests.

The instruction mix is roughly 34% load/store, 34% fixed point, 24% floating point (of which slightly over half are done in FMA instructions and 9% branch). L1 cache hit rate is challenging.

Mechanics of Building Benchmark

It involves simple editing of Makefile and src/Makefile.src in order to specify the fortran77 compiler and flags. Also see instructions in the file sphotmk_readme.txt in the tar file.

Mechanics of Running Benchmark

If desired, the user can change the run parameters from the default values by editing the file src/rdinput.f and recompiling. The user can control the number of iterations of the outermost loop by changing the parameter NRuns. Execution time is linear in NRuns. Furthermore, the user can change the amount of computation a single iteration of the outermost loop does by changing the parameter bwgt. The time per iteration of the outermost loop decreases with increasing bwgt. To execute, simply run the executable sphotmk with no arguments. Also see instructions in the file sphotmk_readme.txt in the tar file.

Verification of Results

The output is written directly into stdio. NRuns, the average escape probability, and the time in seconds is printed. The average escape probability is a deterministic and portable result and can be used to check for correctness. The results for various values of NRuns are listed in the file correct_answer. Also see instructions in the file sphotmk_readme.txt in the tar file.