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Exercises for
Computer Architecture
Summer Semester 2020

Exercise Sheet 10

Discussion starts from Monday, July 13, 2020

Useful information about the HotSpot simulator cn be found in “HotSpot.pdf”

10.1 Theory

a) Which output does HotSpot compute and which file formats are used?

b) Which compute models does HotSpot provide? What are the differences?

c) What needs to be considered for the computed temperatures?

d) What is the “steady-state” temperature and what is the “transient” temperature?

10.2 Practical Exercise

In your SVN repository, you will find a folder “10/HotSpotFiles” with all necessary material for this exercise.

- Look at the floorplan “ev6.pdf”. Which thermal behavior do you expect for the single components?
- Compute the “steady-state” temperature for the given “power trace“ file by executing ”./hotspot -c hotspot.config -f ev6.flp -p gcc.ptrace -steady_file gcc.steady”
- Create a copy of the “steady-state” temperature file and save it by executing “cp gcc.steady gcc.init”.
- Use this file now as a warm-up file and and compute the “transient” temperature for the same “power trace” file by executing “./hotspot -c hotspot.config -init_file gcc.init -f ev6.flp -p gcc.ptrace -o gcc.ttrace”.
- Now print out your results as a thermal map:
  - First, compute a grid model with the “steady-state” temperature by executing “./hotspot -c hotspot.config -f ev6.flp -p gcc.ptrace -steady_file gcc.steady -model_type grid -grid_steady_file gccGrid.steady”.
  - After this, execute “./grid_thermal_map.pl ev6.flp gccGrid.steady >gcc.svg” to convert the thermal map to a vector graphics file.

  Now repeat the above steps and use the multicore files (”multicore.flp”and ”multicore.ptrace”). Compare both of your results and consider the structural difference.

General Information: Further information can be found under hhttps://ls12-www.cs.tu-dortmund.de/daes/de/lehre/lehrveranstaltungen/summersemester-2020/rechnerarchitektur-deutsch.html. Submitting solutions to the exercise sheets is not required.