CSCE 692 HW Lab 1 - Cacti Cache Simulator

(100 Points)

Due: NLT 0800 Thursday, 10 January 2019

**Lab Overview:**

Compile CACTI 6.5 on a Linux machine. Use the resulting program, together with the configuration file, to make comparisons of cache performance under various circumstances.

**Guidance:**

* Write your name and a page number on each page
* Show your work
* Clearly indicate your answers
* Explain assumptions and provide references (sources) for any additional information you had to research in order to complete any problem.
* CACTI 6.5 is available in an online form at http://www.hpl.hp.com/research/cacti/ with the tar file on CANVAS and placed at L:\Courses\CSCE\CSCE692\Project\Lab 1
* Remember to use 1024 for KB in CACTI
* For direct mapped, (1-way), input 1 in the associativity box
* You are looking for only two CACTI output items:
  + Access time (ps)
  + Cycle time (ps) – used as the assumed CPU cycle time

**Assignment tasks:**

1. [15] Compile CACTI 6.5 (or run provided binary and determine it works on your machine)
2. Compare access times in Lab1\_initial\_configuration\_input.cfg as you change “associativity”
   1. [5] Access time for associativity 1 =
   2. [5] Access time for associativity 4 =
   3. [5] Access time for associativity 8 =
   4. [5] Access time for associativity 16 =
3. Compare access times across cache sizes (return to associativity = 1)
   1. [5] Access time for 32 KB cache =
   2. [5] Access time for 128 KB cache =
   3. [5] Access time for 1MB KB cache =
4. Using associativity = 4, and a cache size of 128KB, choose two different (and interesting) parameters to vary in the cache configuration input file. Observe and record the output changes. Offer an explanation as to why the varying input would cause the varying output.
   1. [5] Parameter one input change\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. [5] Parameter one output change\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. [15] Explanation
   4. [5] Parameter two input change\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. [5] Parameter two output change\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. [15] Explanation