CS429H, Spring 2011
Memory Mountain
Assigned: Apr. 8, Due: Friday Apr. 15, 11:59PM

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1 Introduction

In this lab, you will learn about the memory throughput of an x86 processor. When you have completed the lab, you will have a better appreciation for bandwidth between main memory, the caches, and the microprocessor.

2 Logistics

This is an individual project. All handins are electronic. Clarifications and corrections will be posted on the course Web page.

3 Handout Instructions

The homework assignment and this instruction sheet can be downloaded from the CS429H labs webpage:

`http://www.cs.utexas.edu/˜fussell/courses/cs429h/labs/labs.shtml`

The assignment is password protected; use the password we gave you in class to access it.

4 Memory Mountain

Your task is to compile and run the memory mountain code. For the code provided, you will need to use a Linux system running on top of the machine with an x86 architecture; any of the CS department machines are suitable. The files are contained in the `memlab.tar` archive. The program is contained in

the files `clock.c`, `fcyc.c`, and `mountain.c`, along with the two associated header files `clock.h` and `fcyc.h`. Just run `make` to build the project, and `./mountain` to execute it.

The output of this program will be a matrix of values that present the memory bandwidth of the computer for different sized working sets and different stride sizes.

To complete your laboratory, you need to graph your results. In addition, you need to write down the model and speed of the microprocessor that you use to get the bandwidth results. You can find some of the information by typing the commands:

```
cat /proc/cpuinfo
cat /proc/meminfo
```

With that information, you can look up the configuration of the internal caches on Intel's website. Your writeup should include this information and an explanation of why the graph of the memory mountain looks as it does. This writeup should not exceed two pages – be concise and clear.

5   Evaluation

Your score will be computed out of a maximum of 30 points: 15 for your graphs, and 15 for the quality of your explanations. You are graded on the quality of your report, so take care to make it intelligible and well-written!

6   Handin Instructions

You will turn in your code using the department's `turnin` program. Convert your report to a PDF file, then submit it as follows:

```
turnin --submit ckm memlab <YourUTCSID>.pdf
```

If you turn in the file more than once, your previous submission is overwritten and the timestamp is updated. You can also use the `--verify` option to check what you last submitted.

We will be using the `turnin` timestamps to keep track of late submissions. You have a combined total of 3 late days to use on all projects this semester, so be careful to submit your project on time.