Department of Electrical and Computer Engineering
Georgia Institute of Technology
ECE 7103-A
Assignment #3

Introduction: This assignment is an In-class Data Prefetching Championship (DPC). It is meant to test your knowledge of prefetchers and to encourage you define the next state-of-the-art memory prefetcher.

Infrastructure: Download the code and traces from: http://comparch-conf.gatech.edu/dpc2

Go through the description of evaluation infrastructure. We will use the eight traces provided in the framework and will use only Configuration 1 for this assignment. Please use PACE systems (and not ecelinsrv) for your studies.

PART-A:

1. Compare the performance of four prefetchers provided in the example_prefetchers directory (ampm, next_line, ip, and stream). Which prefetcher gives the highest performance overall and for each benchmark?
2. Tune the parameters (aggressiveness) of the prefetcher to analyze the sensitivity on the given workloads. For the configurations you analyze, which prefetcher has the highest performance, overall and for each benchmark?
3. Develop a mechanism to select the best prefetcher at runtime for each workload.

PART-B:

Now develop a competitive prefetcher for the in-class championship. This could be a prefetcher that is from a previously published paper, or something that you develop, or a combination of the two.

Fixed Grade: Your job is to design a policy for each track that out-performs the policies that you developed in PART-A. Simply developing these would get you 3 points for each track (total of 9 points out of 10).

Competitive Grade: For part B, if your prefetcher is top ranked you get 5, the next five ranks get 4 points, then the next five get 3 points and so on … till a minimum of 0 points.

We will have a shared Google Docs file to keep track of the current best. I encourage you to update your results and check this often to see your rank.

Submission Files:

You will submit the sources for only Part B as a consolidated tarball **src.tar.gz**. Second, a tarball of the results directory **results.tar.gz**. Your results directory should contain four subdirectories (labeled **lab3.a1, lab3.a2, lab3.a3, lab3.b**). Third, a report file (**report3.pdf**) containing discussions and results from your evaluations. You can use the DPC guidelines while you write your report. **Note:** no source directories are expected for PART-A as it is meant to make you familiar with the infrastructure.