

Homework #5

cpe 631

Kyle Ray

February 26, 2018

Contents

[Answers 1](#_Toc491808573)

[Output 1](#_Toc491808574)

[Source Code 1](#_Toc491808575)

[Appendix 1](#_Toc491808576)

# Purpose

To become familiar with the Intel PIN and learn more about measuring the performance of modern computer systems with specific benchmarks.

# Problem 1

Compile and run the inscount0.cpp pin plugin located in the Pin directory under /source/tools/ManualExamples/ with the following benchmarks 621.wrf\_s and 657.xz\_s for the train input set from the SPEC2017 suite.

The inscount0.cpp pin tool will count the total number of instructions executed by the application run under it.

# Problem 2

Modify the inscount0.cpp to count the number of basic blocks, number of memory reads, number of memory writes, and the total number of executed instructions. Profile single-threaded applications and output the results to a file. Demonstrate the application on simple benchmarks matrix\_multiplication and accumulating elements of an array as well as profile at least two benchmarks 621.wrf\_s and 657.xz\_s. Note: simple benchmarks can be found at /apps/arch/arch.tut/simpleBenchmarks

# Bonus

Count and print the statistics for each thread in a separate column for a multithreaded program. This will require modifying the pin tool from problem 2 and making it work with multi-threaded applications. Note: that the pin tool will not generally work with pthreads or other multithreaded paradigms, there is a pin tool thread api that is provided and the code written for this problem should make use of that.

# Problem 3

Design and implement a PIN instrumentation tool for profiling dynamic basic blocks (or streams) in a program. A dynamic basic block is defined as a sequential run of instructions that starts with an instruction that is a target of a taken branch and ends with the first taken branch in a sequence.

# Appendix

Add anything else that might be pertinent to the assignment.