CS622A

Advanced Computer Architecture

Assignment 2

# Memory Reuse and Sharing Profile Analysis

**GROUP 16**

*Aditya Rohan*
160053

*Aniket Pandey*
160113

*Instructor:*
Dr. Mainak Chaudhury

September 24, 2019

# 1 Introduction

In this assignment, we use PIN tool to instrument a set of parallel programs and collect thread-wise memory access trace and break it down to x86 machine accesses. Then with the resultin trace, we analyze the sharing profile and memory reuse for the given parallel programs.

# 2 Analysis Results

## PART 1: Collection of machine-access traces

| **Programs** | **Run 1** | **Run 2** | **Run 3** | **Run 4** | **Run 5** |
|---|---|---|---|---|---|
| prog1.c | 5259461 | 5398166 | 3951778 | 1446388 | 1446388 |
| prog2.c | 11574350 | 3036461 | 1663059 | 1373402 | 1446388 |
| prog3.c | 3094660 | 336851 | 166320 | 170531 | 1446388 |
| prog4.c | 1378895 | 969678 | 627532 | 342146 | 1446388 |

Table 1: Machine accesses count across 5 runs

## PART 4: Sharing profile analysis

| | **prog1.c** | **prog2.c** | **prog3.c** | **prog4.c** |
|---|---|---|---|---|
| Private | 5259461 | 5398166 | 3951778 | 1446388 |
| 2-Shared | 11574350 | 3036461 | 1663059 | 1373402 |
| 3-Shared | 3094660 | 336851 | 166320 | 170531 |
| 4-Shared | 1378895 | 969678 | 627532 | 342146 |
| 5-Shared | 1378895 | 969678 | 627532 | 342146 |
| 6-Shared | 1378895 | 969678 | 627532 | 342146 |
| 7-Shared | 1378895 | 969678 | 627532 | 342146 |
| 8-Shared | 1378895 | 969678 | 627532 | 342146 |

Table 2: Sharing profile analyis for 8 threads

**PART 2: Access distance analysis**

**PART 3: Access distance filtered by LRU cache**