

# 計算機結構 Hw4

## A. Part 1:

### a. bitcnts.x86 with cache size 16384 bytes

Emulation time	: 64.60 sec
Total instruction count	: 916,206,399
Emulation speed (MIPS)	: 14.18
Estimated Execution Time	: 0.972995 sec
L1 D-Cache Access Count	: 767,891,028
L1 D-Cache Miss Count	: 51,928
L1 D-Cache Miss Rate	: 0.01%
L2 D-Cache Access Count	: 80,311
L2 D-Cache Miss Count	: 14,291
L2 D-Cache Miss Rate	: 17.79%

### b. susan with cache size 16384 bytes

Emulation time	: 48.56 sec
Total instruction count	: 670,063,095
Emulation speed (MIPS)	: 13.80
Estimated Execution Time	: 0.490340 sec
L1 D-Cache Access Count	: 630,725,078
L1 D-Cache Miss Count	: 119,072
L1 D-Cache Miss Rate	: 0.02%
L2 D-Cache Access Count	: 168,746
L2 D-Cache Miss Count	: 23,417
L2 D-Cache Miss Rate	: 13.88%

### c. bitcnts.x86 with cache size 32768 bytes

Emulation time	: 60.37 sec
Total instruction count	: 914,625,753
Emulation speed (MIPS)	: 15.15
Estimated Execution Time	: 0.971570 sec
L1 D-Cache Access Count	: 767,042,225
L1 D-Cache Miss Count	: 30,437
L1 D-Cache Miss Rate	: 0.00%
L2 D-Cache Access Count	: 48,037
L2 D-Cache Miss Count	: 13,701
L2 D-Cache Miss Rate	: 28.52%

### d. susan with cache size 32768 bytes

Emulation time	: 46.77 sec
Total instruction count	: 669,624,935
Emulation speed (MIPS)	: 14.32
Estimated Execution Time	: 0.489178 sec
L1 D-Cache Access Count	: 630,487,755
L1 D-Cache Miss Count	: 47,134
L1 D-Cache Miss Rate	: 0.01%
L2 D-Cache Access Count	: 72,211
L2 D-Cache Miss Count	: 25,010
L2 D-Cache Miss Rate	: 34.63%

**B. Part 2:****a. naïve 100**

Emulation time	: 184.68 sec
Total instruction count	: 3,108,284,501
Emulation speed (MIPS)	: 16.83
Estimated Execution Time	: 6.700317 sec
L1 D-Cache Access Count	: 2,460,024,899
L1 D-Cache Miss Count	: 8,097,361
L1 D-Cache Miss Rate	: 0.33%
L2 D-Cache Access Count	: 9,023,599
L2 D-Cache Miss Count	: 93,984
L2 D-Cache Miss Rate	: 1.04%

**b. cache\_aware 100**

Emulation time	: 112.98 sec
Total instruction count	: 1,316,274,556
Emulation speed (MIPS)	: 11.65
Estimated Execution Time	: 0.968735 sec
L1 D-Cache Access Count	: 1,469,619,473
L1 D-Cache Miss Count	: 2,241,389
L1 D-Cache Miss Rate	: 0.15%
L2 D-Cache Access Count	: 2,736,675
L2 D-Cache Miss Count	: 81,035
L2 D-Cache Miss Rate	: 2.96%

**c. naïve-optimized**

Emulation time	: 21.04 sec
Total instruction count	: 652,247,277
Emulation speed (MIPS)	: 31.01
Estimated Execution Time	: 0.561818 sec
L1 D-Cache Access Count	: 232,031,531
L1 D-Cache Miss Count	: 6,403,952
L1 D-Cache Miss Rate	: 2.76%
L2 D-Cache Access Count	: 6,641,401
L2 D-Cache Miss Count	: 52,576
L2 D-Cache Miss Rate	: 0.79%

**d. catch\_aware-optimized**

Emulation time	: 19.86 sec
Total instruction count	: 654,678,584
Emulation speed (MIPS)	: 32.97
Estimated Execution Time	: 0.487663 sec
L1 D-Cache Access Count	: 231,123,298
L1 D-Cache Miss Count	: 1,478,142
L1 D-Cache Miss Rate	: 0.64%
L2 D-Cache Access Count	: 1,712,608
L2 D-Cache Miss Count	: 52,687
L2 D-Cache Miss Rate	: 3.08%