Cache Simulator

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Features

- Associativity:
  - 1 (Directly mapped)
  - 2, 4, or 8-set associative
- Replacement policy
  - LRU (Least Recently Used)
- Write policies
  - write-through, write-back; write-allocate

Features

- Distinct instruction and data memories
- Non-layered hierarchy (next level is RAM)
- Customizable block size (2^n)
- Customizable memory size (2^m)
- Customizable access penalties

Architecture

- Cross-platform
  - written in Python 2.7
  - no external dependencies
  - uses sys.open() and print()
- Reads Dinero-format cache trace files

Architecture

Memory.py - simulates RAM

Cache.py - simulates CPU cache

Clock.py - simulates a CPU clock

(Memory and Cache share it)

CacheSim.py - reads parameters, trace file

Demonstration

Trace file - sample.din

```
0 20d        Dinero input format "din" is an ASCII file with
0 211        one LABEL and one ADDRESS per line.  The rest of
0 1fc780     the line is ignored so that it can be used for
1 7fffccb0   comments.
0 213
0 217        LABEL = 0 read data
0 1fc77c               1 write data
2 7fffccac             2 instruction fetch
```

Notes

- No timer. Just counting of cycles
- No data is moved (not necessary)
- Not as complete as Dinero

  http://pages.cs.wisc.edu/~markhill/DineroIV/