

CSE 341
Dinero IV
Cache Simulator

What is Dinero?

- Dinero is a cache simulator

How to Use Dinero

- Run on *pollux.cse.buffalo.edu*
 - ☞ Try using your *timberlake* password
 - ☞ If that doesn't work, use your default password
 - ↳ Information on Determining Your Default Password
 - ✓ <https://wiki.cse.buffalo.edu/services/content/cse-unixlinux-accounts>
- Command
 - ☞ `dineroIV [options]`

Input File Format

- Standard Input
- Each line is a memory reference
- Two Items per Line
 - ☞ Access Type
 - ↳ Read (r)
 - ↳ Write (w)
 - ↳ Fetch (i)
 - ☞ Address
 - ↳ Hexadecimal Value
 - ↳ Ranges from 0x00000000 through 0xFFFFFFFF
 - ☞ Remaining items are ignored and can be treated as comments
- Example

```
i 0x400400AC 4 Instruction Fetch
i 0x400400B0 4 Instruction Fetch
r 0x40000100 2 Load (Halfword)
i 0x400400B4 4 Instruction Fetch
w 0x40000102 1 Store (Byte)
```

Specifying the Cache to be Simulated

● Command Line Arguments

☞ Block Size for Level **N**

☞ `-lN-Tbsize P`

✓ **N** ≡ Level

✓ **T** ≡ Type

- Instruction (**i**)
- Data (**d**)
- Unified or Mixed (**u**)

✓ **P** ≡ Size (bytes)

- Can contain k, m, g for kilo, mega, giga

☞ **Note** `-l` refers to dash (-) followed by lowercase **L**

☞ Capacity of Level **N**

☞ `-lN-Tsize P`

✓ **N** ≡ Level

✓ **T** ≡ Type

✓ **P** ≡ Size (bytes)

- Can contain k, m, g for kilo, mega, giga

☞ **Note** `-l` refers to dash (-) followed by lowercase **L**

☞ Associativity for Level **N**

☞ `-lN-Tassoc U`

✓ **N** ≡ Level

- Range from 1 to 5

✓ **T** ≡ Type

✓ **U** ≡ Associativity

- 1 for Direct-mapped

- Set to the number of blocks in level **N** for fully associative

☞ **Note** `-l` refers to dash (-) followed by lowercase **L**

☞ Replacement Policy for Level **N**

☞ `-lN-Trepl C`

✓ **N** ≡ Level

✓ **T** ≡ Type

✓ **C** ≡ Replacement Policy

- LRU (**l**)
- FIFO (**f**)
- Random (**r**)

☞ **Note** `-l` refers to dash (-) followed by lowercase **L**

Compulsory, Conflict, & Capacity Miss Statistics

- Command Line Arguments

- ☞ Computer of Compulsory, Conflict, & Capacity Miss Rates for Level **N**

- ☞ `-lN-Tccc`

- ✓ **N** ≡ Level

- Range from 1 to 5

- ✓ **T** ≡ Type

- ☞ Note `-l` refers to dash (-) followed by lowercase **L**

Specifying the Input Format

- Command Line Argument

- ☞ `-informat D`

- ☞ **D** ≡ Extended Dinero Format

- ☞ The Extended Dinero Format is specified previously in this set of notes

Using Input from a File

- Command Line Argument

- ☞ `< in_filename.din`

- ☞ **in_filename** ≡ Input File

- ☞ Use the `.din` extension for Dinero input files

Redirecting Output to a File

- Command Line Argument

- ☞ `> out_filename`

- ☞ **out_filename** ≡ Output Filename

- ☞ Standard Text File Output

Example

- Simulate a 512 KB unified four way set associative cache (single level). The block size is 64 bytes. The trace is contained in a file called `prog_trace.din`. Redirect the output to a file called `results.txt`.

- ☞ Command:

```
dineroIV -l1-ubsize 64 -l1-usize 512k -l1-uassoc 4 -  
l1-urepl 1 -l1-uccc -informat D < prog_trace.din >  
results.txt
```

References

- DineroIV man page