CS6600 Computer Architecture (Jul-Nov 2021)
Assignment-6

Karthikeyan R EE18B015
Nithin Babu EE18B021

Cache simulator

Types of Caches simulated

- Fully Associative Cache
- Direct Mapped Cache
- Set- associative Cache

Methods to implement replacement policies

- **LRU Replacement Policy:** Along with the 2D array of Cache, there is an additional 2D array, lru_list that keeps the order of the recently accessed cache blocks, for each user of the cache. While evicting a cache block, the lru_list will be referred and the block with the highest number will be evicted. Preference is given for the least used dirty blocks in the cache.
- **Pseudo Replacement Policy (Bit Pseudo LRU)**: Along with the 2D array of Cache, there is an additional 2D array, plru_list that keeps a single bit value (1 or 0) for all the blocks of the cache. While evicting a cache block for a set, the leftmost block with 0 bit value is chosen for the eviction. Preference is given for the least used dirty blocks in the cache.

- **Random Replacement policy:** For this type of replacement policy, a random cache block is selected for eviction. Preference is given for the dirty blocks in the cache.

Output observed for input.txt

The output observed when simulated with the given input trace file, input.txt is as follows:

Cache Size	: 4096
Block Size	: 64
Type of Cache	: Direct-mapped cache
Replacement Policy	: LRU Replacement
Cache accesses	: 25
Read accesses	: 12
Write accesses	: 13
Cache misses	: 25
Compulsory misses	: 25
Capacity misses	: 0
Conflict misses	: 0
Read misses	: 12
Write misses	: 13
Dirty Blocks Evicted	: 2

Submission

Please find the relevant submission files here.