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Assignment 4

Read Me

The direct mapped cache is implemented by using an array of blocks (a typedef I created). When the address input enters the program, the blocks offset bits are shifted appropriately and the remaining bits map out the cache. In order to read or write, the cache goes through the `direct_Op` function and performs the operation.

The n-way Associative cache uses a 2 dimensional array of blocks. The first [] is used for index and the second [] is used for the block in the set. The block index and block set are saved and then bit shifted appropriately. In order to read or write, the cache goes through the `assoc_Op` function. It uses the LRU algorithm to decide which blocks leave the cache. The recent access variable keeps track of the counter to decide which block is later taken out of the cache.

The replacement algorithm, or the LRU, decides which block in the set leaves the cache. The global counter keeps track of every memory access. The recent access gets the value of the global counter and the lowest value will be chosen to leave the cache.

The write through works because when a write through is called, it will always call a write to memory as well. The write back uses the dirty bit. Whenever a write hit occurs, the dirty bit is set to 1 and the block leaves the cache. The address is written and stored in memory.