ECE 506 Project 2 Report

Santosh Srivatsan

November 14, 2023

Part 1: Modified MSI: Plotting the number of memory transactions for the long trace

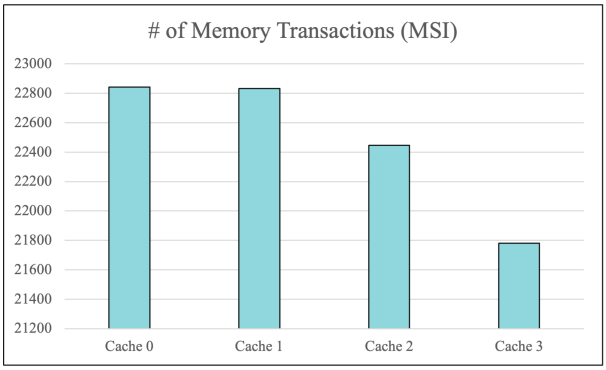
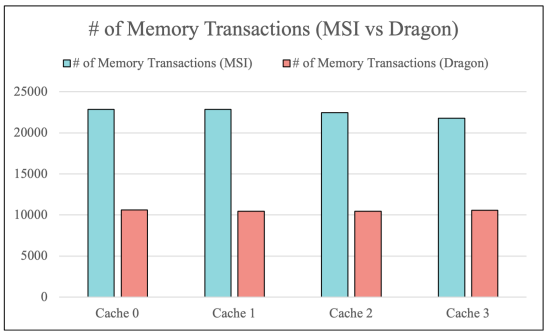


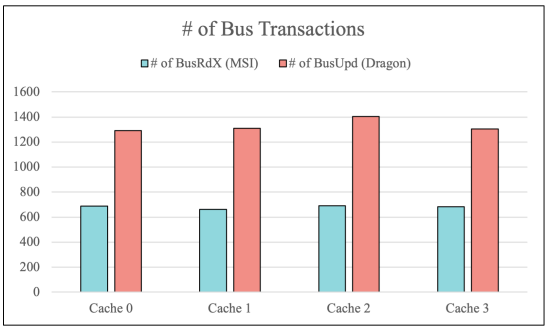
Figure 1: # of memory transactions for different cores for the long trace.

Part 2: Comparing the Modified MSI and Dragon protocols

- The modified MSI optimization does not allow a block to be shared by multiple cores.
- The block is invalidated from one core when it is requested by another resulting in a large number of memory transactions (Fig. 2a).
- On the other hand, the Dragon protocol is *update* based and allows the sharing of a block among multiple caches.
- A block is only flushed to memory when its owner (who is in the `SHARED_MODIFIED` state) is evicted.
- However, as seen in Fig 2b, the Dragon protocol involves more bus transactions to keep a block updated in every core.



(a) # of Memory Transactions



(b) # of Bus Transactions

Figure 2: Comparing the Modified MSI and Dragon protocols.