

Quiz 8

1. List and define the three C's.

1. Conflict -- cache misses due to data being evicted from the cache.
2. Capacity -- misses due to the application accessing more data than can fit in the cache.
3. Compulsory -- misses due to accessing data for the first time.

2. Give one technique for reducing each of them.

1. Conflict -- increase associativity or cache size.
2. Capacity -- restructure the application or increase capacity
3. Compulsory -- increase cache line size or prefetch data

3. What's the difference between write through and write back?

1. Write through: update the data in next level memory for each write
2. Write back: only update the copy of data in top level of memory hierarchy. Writes to the next level when data get evicted from memory.

4. Between write allocate and no-write allocate
 1. Allocate space for the missing data requested by writes.
 2. Only allocate space for the missing data requested by reads.

5. A cache holds 4KB, is 4-way set associative, and has 32 byte lines. How many tag, index, and offset bits are there?
 1. tag: 22 bits
 2. index: 5 bits
 3. offset: 5 bits