CS352 – Assignment #7
Oct 20, 2008

Weight: 50 points
Due date: Monday, Oct 27, 2008 (beginning of class)

1. Textbook – 7.9, 7.10

In the following problems, K = 1024 = 2^{10}

2. We have 1 MByte = 1024 KByte cache, with each cache line (block) with 16 bytes per cache block and organized as a direct-mapped cache. Main memory addresses are 32 bits.
   a. Draw a diagram of a 32 bit address, giving the positions of the byte offset, block index and tag fields.
   b. Assume that the cache is empty (all entries NOT VALID). Show how the following sequenceof memory references (reads) would be processed with this cache; for each address give the value of the tag, the block index and the byte offset and whether it is a HIT or a MISS; if a MISS, give new contents of the tag field for the cache block.

      i. x40010200
      ii. 0x40010204
      iii. 0x40010228
      iv. 0x4001021c
      v. 0x5001020c
      vi. 0x50010210
      vii. 0x50010214
      viii. 0x50010228

3. Repeat problem #2 except assume that the cache is organized as a 4-way set associative cache. In the diagram of the address, give the set index rather than the block index.

4. Textbook: 7.14, 7.15