Practice HW Cache Problem

December 8, 2016

1. We’re given a memory system with the following properties:
   - Memory is byte addressable and is accessible in 1-byte words (not 4-byte words)
   - Physical addresses are 13 bits wide
   - The cache is 4-way set associative
   - Cache lines are 4 bytes
   - There are 16 lines

(a) Which bit(s) of a 13-bit address are used for:
   i. (1 point) Offset within a cache line
   ii. (1 point) Set index
   iii. (1 point) Cache tag

i. ____________

ii. ____________

iii. ____________
(b) Suppose that we attempt to access address 0x0E34

i. (1 point) What is the address in binary?

ii. (1 point) In what set would the block be found if it were in the cache?

iii. (1 point) What is the cache tag?

iv. (1 point) Is it a cache hit?  A. yes  B. no

v. (1 point) What is the byte returned?
(c) Suppose that we attempt to access address 0x1913?
   i. (1 point) What is the address in binary?
   ii. (1 point) In what set would the block be found if it were in the cache?
   iii. (1 point) What is the cache tag?
   iv. (1 point) Is it a cache hit? A. yes  B. no
   v. (1 point) What is the byte returned?