# CSCI 223 Computer Org. & Assembly Language

## Homework #8

Name:

Due: 9:30am on Thursday 4/4/2024
Submission: Type your answer using any text editor (no handwriting) and upload the file to the Blackboard. No late submission will be accepted

Suppose we have a system with the following properties:

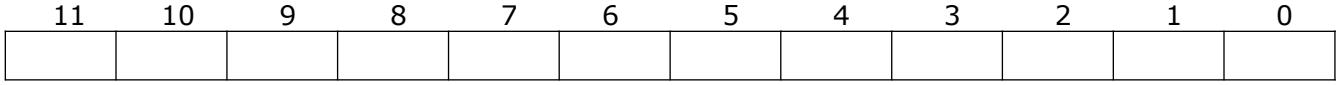
- The memory is byte addressable
- Memory accesses are to 1-byte words (not to 4-byte words)
- Addresses are 12 bits wide
- The cache is 2-way set associative with a 4-byte block size and 4 sets

The contents of the cache are as follows, with all addresses, tags, and values given in hexadecimal notation:

| Set index | Tag | Valid | Byte 0 | Byte 1 | Byte 2 | Byte 3 |
|---|---|---|---|---|---|---|
| 0 | 00 | 1 | 40 | 41 | 42 | 43 |
| | 83 | 1 | FE | 97 | CC | D0 |
| 1 | 00 | 1 | 44 | 45 | 46 | 47 |
| | 83 | 0 | -- | -- | -- | -- |
| 2 | 00 | 1 | 48 | 49 | 4A | 4B |
| | 40 | 0 | -- | -- | -- | -- |
| 3 | FF | 1 | 9A | C0 | 03 | FF |
| | 00 | 0 | -- | -- | -- | -- |

A. The following diagram shows the format of an address (one bit per box). Indicate (by labeling the diagram) the fields that would be used to determine the following:

CO The cache block offset
CI The cache set index
CT The cache tag




B. For each of the following memory accesses indicate if it will be a cache hit or miss when **carried out in sequence** as listed. Also give the value of a read if it can be inferred from the information in the cache. Show your work or no point will be given.

| Operation | Address | Hit? | Read value (or unknown) |
|---|---|---|---|
| Read | 0x834 | | |
| Write | 0x836 | | |
| Read | 0xFFD | | |