Com S 321       Homework 9

1. Consider the following reference string given as WORD addresses:

1, 4, 8, 5, 20, 17, 19, 56, 9, 11, 4, 43, 5, 6, 9, 17.

Assume a Direct-Mapped cache with 16 one-word block frames that is initially empty. When this reference string is processed, label each reference as a Hit or Miss, and pictorially show the state of the cache as each word address is processed. The state of the cache at the end should be the final state after the last word is processed.

2. Using the same reference string as in Problem 1, indicate the Hits and Misses and show the state of the cache after each address including the final contents for a Direct-Mapped cache with 4-word block frames and a total cache size of 16 words.

3. Using the same reference string as in Problem 1, indicate the Hits and Misses and show the state of the cache after each address including the final contents for a Set Associative cache with a total size of 16 words, a Block frame size of one-word and a Set size of 2 (that is, 2 block frames per set). Within a Set, assume an LRU (Least Recently Used) policy for block replacement.

4. Repeat Problem 3 with a FIFO (First In First Out) policy for block replacement.

5. Repeat Problem 3 with an MRU (Most Recently Used) policy for block replacement.