

Name: **SOLUTION**  
 Student #: \_\_\_\_\_

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 College of Computer Sciences and Engineering  
 Department of Computer Engineering

COE 308 – Computer Architecture (T041)

**Quiz # 02 – Solution**

**\*\*\* Show all your work. No credit will be given if work is not shown! \*\*\***

**Problem # 1 (20 points):** Using the reference matrix to implement the LRU algorithm for the following reference sequence:

7, 5, 1, 5, 5, 1, 7, 2, 6

Furthermore, **calculate the hit ratio** for the sequence given above. Assume that the cache consists of four blocks. Assume also that initially the cache is empty, and when filling the cache **initially** the block filling sequence is block 0, block 1, block 2, and finally block 3.

**Solution:** F = Fill, A = Access (*i.e. Hit*), R = Replace

<b>TAG</b>	<b>7</b>	<b>5</b>	<b>1</b>	<b>5</b>	<b>5</b>
<b>Block</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>Comment</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>A</b>	<b>A</b>
<b>LRU Blk</b>			<b>3</b>	<b>3</b>	<b>3</b>
<b>TAG</b>	<b>1</b>	<b>7</b>	<b>2</b>	<b>6</b>	
<b>Block</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	
<b>Comment</b>	<b>A</b>	<b>A</b>	<b>F</b>	<b>R</b>	
<b>LRU Blk</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	

**Hit Ratio = 4 / 9 = 0.44 = 44%**