# CS 4400 - Problem Set 8

**Rob Johansen**

**u0531837**

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1. Problem 6.31:

   A. The size ($C$) of the cache in bytes is:

   $C = E * B * S = 4 * 4 * 8 = 128$

   B. These are the bits for the ***CO*** (cache block offset), ***CI*** (cache set index), and ***CT*** (cache tag):

| 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***CT*** | ***CT*** | ***CT*** | ***CT*** | ***CT*** | ***CT*** | ***CT*** | ***CT*** | ***CI*** | ***CI*** | ***CI*** | ***CO*** | ***CO*** |

2. Problem 6.32:

   A. This is the address format:

| 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***0*** | ***0*** | ***1*** | ***1*** | ***1*** | ***0*** | ***0*** | ***0*** | ***1*** | ***1*** | ***0*** | ***1*** | ***0*** |

   B. This is the memory reference:

| Parameter | Value |
|---|---|
| Block offset (CO) | 0x2 |
| Index (CI) | 0x6 |
| Cache tag (CT) | 0x38 |
| Cache hit? (Y/N) | Y |
| Cache byte returned | 0xEB |

3. Problem 6.33:

A. This is the address format:

| 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *1* | *0* | *1* | *1* | *0* | *1* | *1* | *1* | *0* | *1* | *0* | *0* | *0* |

B. This is the memory reference:

| Parameter | Value |
|---|---|
| Block offset (CO) | 0x0 |
| Index (CI) | 0x2 |
| Cache tag (CT) | 0xB7 |
| Cache hit? (Y/N) | N |
| Cache byte returned | — |

4. Problem 6.34. These are the 8 memory addresses (in hex) that will hit in set 2:

0x1788
0x1789
0x178A
0x178B
0x16C8
0x16C9
0x16CA
0x16CB

5. Problem 6.35:

dst array

| | Col 0 | Col 1 | Col 2 | Col 3 |
|---|---|---|---|---|
| Row 0 | m | m | m | m |
| Row 1 | m | m | m | m |
| Row 2 | m | m | m | m |
| Row 3 | m | m | m | m |

src array

| | Col 0 | Col 1 | Col 2 | Col 3 |
|---|---|---|---|---|
| Row 0 | m | m | m | m |
| Row 1 | m | m | m | m |
| Row 2 | m | m | m | m |
| Row 3 | m | m | m | h |