# CS2100 Tutorial 11

AY 24/25 Sem 2 — github/omgeta

Q1.

Q2. Solution:

| Cache set | Valid bit | Tag | Word0 | Word1 | Valid bit | Tag | Word0 | Word1 |
|---|---|---|---|---|---|---|---|---|
| 0 | $\theta$ 1 | $\theta$ | ~~M[0]~~ | ~~M[4]~~ | $\theta$ 1 | | ~~M[32]~~ | ~~M[36]~~ |
| | | 2 | ~~M[64]~~ | ~~M[68]~~ | | 7 | ~~M[224]~~ | ~~M[228]~~ |
| | | 1 | M[32] | M[36] | | 2 | M[64] | M[68] |
| 1 | $\theta$ 1 | 2 | ~~M[72]~~ | ~~M[76]~~ | $\theta$ 1 | 1 | M[40] | M[44] |
| | | 5 | M[168] | M[172] | | | | |
| 2 | $\theta$ 1 | 0 | M[16] | M[20] | $\theta$ 1 | 2 | M[80] | M[84] |
| 3 | $\theta$ 1 | 0 | M[24] | M[28] | 0 | | | |

Q3. (a.)

| | |
|---|---|
| Instruction Cache Block 0 | [i16, .....] |
| Instruction Cache Block 1 | [i12, i13, i14, i15] |

(b.) $9 + 7 \times 9 = 72$

(c.)

| | |
|---|---|
| Instruction Cache Block 0 | [i16, ..] |
| Instruction Cache Block 1 | [i10, i11] |
| Instruction Cache Block 2 | [i4, i5] |
| Instruction Cache Block 3 | [i14, i15] |

(d.) $6 + 7 \times 9 = 69$

(e.)

| | |
|---|---|
| Data Cache Block 0 | s[32..39] |
| Data Cache Block 1 | s[24..31] |

(f.) $\frac{7}{8}$

(g.) $\frac{7}{72}$