CS2100 Tutorial 2

AY 24/25 Sem 2 — github/omgeta

Q1. a. | turns on the bits where either operand is on

b. & turns on the bits only if on for both operands

c. $\wedge$ turns on bits where the operands differ

d. $\neg$ flips bits

e. << right pads n times with 0

f. >> drops n right-most bits

Q2.

a.
```
lui $t0, 0b1
ori $t0, $t0, 0b0100001100000100
or  $s1, $s1, $t0
```

b.
```
andi $t0, $s1, 0b0000000010001010
or   $s0, $s0, $t0
```

c.
```
xori $t0, $s1, 0b0000000010001010
andi $t0, $t0, 0b0000000010001010
sll  $t0, $t0, 1
lui  $t1, 0b1111111111111111
ori  $t1, $t1, 0b1111111011101011
and  $s2, $s2, $t1
or   $s2, $s2, $t0
```

Q3. a.
```
add $s2, $s0, $s1
```

b.
```
add $s3, $s0, $s1
sub $s3, $s3, $s2
```

c.
```
add  $s2, $s1, $s1
addi $t0, $s0, -2
add  $s2, $s2, $t0
```

d.
```
sub $t0, $s0, $s2
sll $t0, $t0, 1
add $t0, $t0, $s1
sll $t1, $t0, 2
sub $s3, $t1, $t0
```

Q4. a. $31 \rightarrow \$s0 = 0x8000001F$ ■
$0x0AAAAAAA \rightarrow \$s0 = 0x0AAAAAAA$ ■

b. If there are an even number of 1 in $s0, the 31st bit is set to 1, else it is set to 0 ■