ECE 485/585 – Computer Organization and Design

HOMEWORK #2 SOLUTION

Solve the following exercises from the textbook (Chapter 2)

1. Exercise 2.7

Little-Endian		Big-Endian	
Address	Data	Address	Data
12	ab	12	12
8	cd	8	ef
4	ef	4	cd
0	12	0	ab

2. Exercise 2.14

   `r-type, add $s0, $s0, $s0`

3. Exercise 2.15

   `i-type, 0xAD490020`

4. Exercise 2.19

   2.19.1 `0xBABEFEF8`

   2.19.2 `0xAAAAAAA0`

   2.19.3 `0x00005545`

5. Exercise 2.23

   `$t2 = 3`

6. Exercise 2.27

2.27

```
        addi $t0, $0, 0
        beq  $0,  $0, TEST1
LOOP1:  addi $t1, $0, 0
        beq  $0,  $0, TEST2
LOOP2:  add  $t3, $t0, $t1
        sll  $t2, $t1, 4
        add  $t2, $t2, $s2
        sw   $t3, ($t2)
        addi $t1, $t1, 1
TEST2:  slt  $t2, $t1, $s1
        bne  $t2, $0, LOOP2
        addi $t0, $t0, 1
TEST1:  slt  $t2, $t0, $s0
        bne  $t2, $0, LOOP1
```

7. Exercise 2.39

Generally, all solutions are similar:

```
lui $t1, top_16_bits
ori $t1, $t1, bottom_16_bits
```

8. Exercise 2.42

Yes, range is 0x1FFFF004 + 0x1FFFC = 0x2001F000 to 0x1FFFF004 - 0x20000 = 1FFDF004