

ECE 0142 Computer Organization

Homework 6

Assigned: 2/18/16 Due: 2/26/2016 (Friday before recitation)

- Given the following initial memory state, and MIPS code, write down the changed register or memory value for each instruction, and derive the final memory state.

| | | | |
|----|---|------|------------------|
| 0 | 6 | Addi | \$s0, \$0, 4 |
| 4 | 4 | Lw | \$t0, 4(\$s0) |
| 8 | 3 | Lw | \$t1, 8(\$s0) |
| 12 | 2 | Sub | \$s1, \$t0, \$t1 |
| 16 | 0 | Sw | \$s1, 12(\$s0) |

- Write MIPS code to reverse a string "ABCD" stored in the following memory region.

| | |
|----|---|
| 0 | A |
| 4 | B |
| 8 | C |
| 12 | D |

↓

| | |
|----|---|
| 0 | D |
| 4 | C |
| 8 | B |
| 12 | A |

- Write the MIPS assembly code for the following C snippet

```
char A[4] = {1, 2, 3, 4};
int result;
```

```
result = A[0] + A[1] + A[2] + A[3];
```

assuming that the address of A[] is in \$a0, **result** is a variable stored in memory, and its address is in \$a1.