

Name: \_\_\_\_\_

Student Number: \_\_\_\_\_

---

## CSE 2021 - Fall 2009 - Quiz 1

### Short Answer

1. (12 points) Translate the following C code into MIPS-32 assembly language:

```
void swap ( int v[], int k)
{
    int temp;
    temp = v[k];
    v[k] = v[k+1];
    v[k+1] = temp;
}
```

Assume the address of `v[0]` is passed to the procedure in register `$a0` and the value `k` is passed in register `$a1`.

Name: \_\_\_\_\_

---

2. (6 points) Translate the following into machine code:

(a) `addi $t0,$t0,-1`

(b) `.ascii "cse0"`

(c) `-3.75` (single precision)

**CSE 2021 - Fall 2009 - Quiz 1**  
**Answer Section**

**SHORT ANSWER**

1. ANS:

Since the procedure does not return any values \$v registers are not needed.

```

swap:  sll    $t1, $a1, 2    # multiply k by 4 to get address of a[k]
        add   $t1, $a0, $t1  # calc address of a[k]

        lw    $t0, 0($t1)    # $t0 gets a[k]
        lw    $t2, 4($t1)    # $t2 gets a[k+1]

        sw    $t2, 0($t1)    # v[k] gets $t2
        sw    $t0, 4($t1)    # v[k+1] gets $t0

        jr    $ra            # return to calling routine

```

PTS: 12

2. ANS:

(a) 001000 01000 01000 1111 1111 1111 1111

(b) 0x30657363 0011 0000 0110 0101 0111 0011 0110 0011

(c)  $-1.111 \times 2^1$  1 10000000 1110 0000 0000 0000 0000 000

PTS: 6