Part K: Assembly Language, part 2 (16 marks)

We need to extend the MIPS assembler to create the following new pseudo instructions. For each new pseudo-instruction, provide the implementation using real MIPS instructions. Only implementations that use the fewest instructions will get full marks. Do not use existing pseudo-instructions to implement these pseudo-instructions. **(16 marks total)**

a) `swap $s, $t` Swap the contents of register `$s` and register `$t`. **(4 marks)**

```
addi $t1, $s, 0
addi $s, $t, 0
addi $t, $t1, 0
```

b) `divi $s, i` Divide register `$s` by the immediate value `i`. **(4 marks)**

```
li $to, i
div $s, $to
```

c) `ble $s, $t, label` Branch to `label` if `$s` ≤ `$t`. **(4 marks)**

```
sub $to, $s $t
blez $to, label
```

d) `clear label` Set the memory location at `label` to zero. **(4 marks)**

```
la $t1, label
add $s0, $zero, $zero
sw $s0, 0($to)
```