

Solution: Assignment 2

Due Sept. 19

October 1, 2008

2.10

Assume the six variables `f` through `k` correspond to six registers `s0` through `s5` and that register `t2` contains 4. Also `t4` holds the base address to the jump table.

```
        slt $t3, $s5, $zero      # test k < 0
        bne $t3, $zero, Exit     # if so, exit
        slt $t3, $s5, $t2       # test k < 4
        beq $t3, $zero, Exit     # if not, exit
        sll $t1, $s5, 2         # $t1 = 4*k
        add $t1, $t1, $t4       # $t1 = &JumpTable[k]
        lw $t0, 0($t1)          # $t0 = JumpTable[k]
        jr $t0                  # jump register
L0:     add $s0, $s3, $s4        # k == 0
        j Exit                  # break
L1:     add $s0, $s1, $s2        # k == 1
        j Exit                  # break
L2:     sub $s0, $s1, $s2        # k == 2
        j Exit                  # break
L3:     sub $s0, $s3, $s4        # k == 3
        j Exit                  # break
Exit:
```

2.11.a

```
if (k==0) f = i + j;
else if (k==1) f = g + h;
else if (k==2) f = g - h;
else if (k==3) f = i - j;
```

2.11.b

```
bne $s5, $0, C1 # branch k != 0
add $s0, $s3, $s4 # f = i + j
    j    Exit # break
C1: addi $t0, $s5, -1 # $t0 = k - 1
    bne $t0, $0, C2 # branch k != 1
    add $s0, $s1, $s2 # f = g + h
    j    Exit # break
C2: addi $t0, $s5, -2 # $t0 = k - 2
    bne $t0, $0, C3 # branch k != 2
    sub $s0, $s1, $s2 # f = g - h
    j    Exit # break
C3: addi $t0, $s5, -3 # $t0 = k - 3
    bne $t0, $0, Exit # branch k != 3
sub $s0, $s3, $s4 # f = i - j
Exit:
```