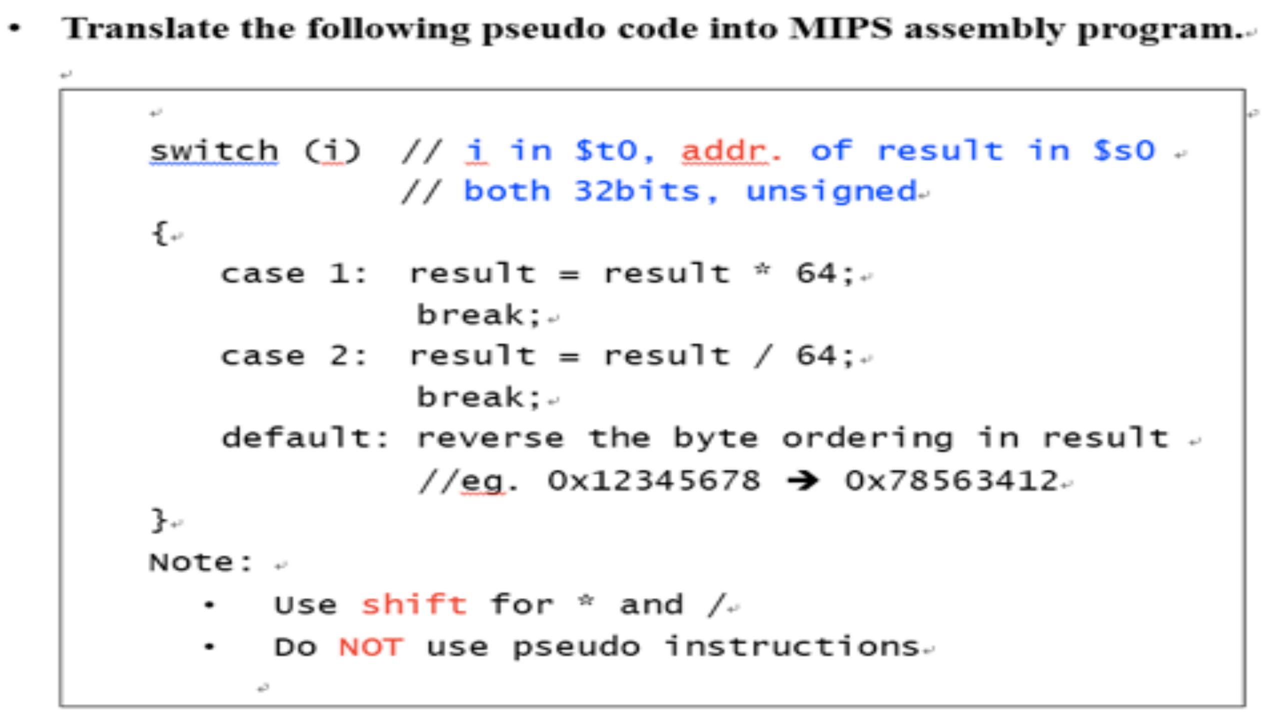
2016計算機組織 Quiz#1 Solution



- **Translate the following pseudo code into MIPS assembly program.**

```
switch (i)  // i in $t0, addr. of result in $s0
            // both 32bits, unsigned
{
    case 1:  result = result * 64;
             break;
    case 2:  result = result / 64;
             break;
    default: reverse the byte ordering in result
             //eg. 0x12345678 → 0x78563412
}
Note:
    •  Use shift for * and /
    •  Do NOT use pseudo instructions
```

```
            lw      $t1,    0 ( $s0 )           # load data
            addi    $t4,    $zero, 0            # initial and store result
            addi    $t2,    $zero, 1
            beq     $t0,    $t2,    case1       # if i is '1' jump to case1
            addi    $t2,    $zero, 2
            beq     $t0,    $t2,    case2       # if i is '2' jump to case2
            j       default                     # else jump to default

case1:      sll     #t4,    #t1,    6           # result = result * (2^6)
            j       break
case2:      srl     #t4,    #t1,    6           # result = result / (2^6)
            j       break
default:    addi    $t2,    $zero, 255          # set a mask  0x000000FF
            addi    $t5,    $zero, 3            # set a counter as 3
Loop:       and     $t3,    #t1,    $t2         # use mask
            add     $t4,    $t4,    $t3         # store result
            beq     $t5,    $zero, break        # finish and break
            sll     $t4,    $t4,    8           # result shift left 2 word
            srl     $t1,    $t1,    8           # original value shift right 2 word
            addi    #t5,    $t5,    -1          # counter - -
            J       Loop
break:      sw      $t4,    0($s0)              # store data
```