Báo cáo thực hành KTMT tuần 4

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Assignment 1

TH1: $s1 = 0x7fffffff, $s2 = 1

```
#Laboratory Exercise 4, Home Assignment 1
.text
start:
addi $s1,$zero,0x7fffffff
addi $s2,$zero,1
li $t0,0 #No Overflow is default status
addu $s3,$s1,$s2 # s3 = s1 + s2
xor $t1,$s1,$s2 #Test if $s1 and $s2 have the same sign
bltz $t1,EXIT #If not, exit
slt $t2,$s3,$s1 #$s3<$s1
bltz $s1,NEGATIVE #Test if $s1 and $s2 is negative?
beq $t2,$zero,EXIT #s1 and $s2 are positive
# if $s3 > $s1 then the result is not overflow
j OVERFLOW
NEGATIVE:
bne $t2,$zero,EXIT #s1 and $s2 are negative
# if $s3 < $s1 then the result is not overflow
OVERFLOW:
li $t0,1 #the result is overflow
EXIT:
```

Thanh ghi	Giá trị ban đầu	Giá trị sau
$s1	0x00000000	0x7fffffff
$s2	0x00000000	0x00000001
$t0	0x00000000	0x00000000
$s3	0x00000000	0x80000000
$t1	0x00000000	0x7ffffffe
$t2	0x00000000	0x00000001
$t0	0x00000000	0x00000001

$zero	0	0x00000000
$at	1	0x7fffffff
$v0	2	0x00000000
$v1	3	0x00000000
$a0	4	0x00000000
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000001
$t1	9	0x7ffffffe
$t2	10	0x00000001
$t3	11	0x00000000
$t4	12	0x00000000
$t5	13	0x00000000
$t6	14	0x00000000
$t7	15	0x00000000
$s0	16	0x00000000
$s1	17	0x7fffffff
$s2	18	0x00000001
$s3	19	0x80000000
$s4	20	0x00000000
$s5	21	0x00000000
$s6	22	0x00000000
$s7	23	0x00000000
$t8	24	0x00000000
$t9	25	0x00000000

Thanh ghi $t0 = 1, xảy ra tràn số

⇨ Kết quả đúng

Assignment 2

```
1  .text
2  li $s0, 0x12345678
3  #Extract MSB of $s0, store in $t0
4  andi $t0,$s0,0xff000000
5  srl $t0,$t0,24
6  #Clear LSB of $s0, store in $t1
7  andi $t1,$s0,0xffffff00
8  #Set LSB of $s0 (bits 7 to 0 are set to 1), store in $t2
9  ori $t2,$s0,0x000000ff
10 #Clear $s0 (s0=0, must use logical instructions)
11 andi $s0,$s0, 0
```

Kết quả sau chương trình:

$t0	8	0x00000012
$t1	9	0x12345600
$t2	10	0x123456ff
$t3	11	0x00000000
$t4	12	0x00000000
$t5	13	0x00000000
$t6	14	0x00000000
$t7	15	0x00000000
$s0	16	0x00000000
$s1	17	0x00000000
$s2	18	0x00000000
$s3	19	0x00000000
$s4	20	0x00000000
$s5	21	0x00000000
$s6	22	0x00000000
$s7	23	0x00000000

Assignment 3

a. *abs $s0,s1*

```
sra $at, $s1, 0x1f
xor $s0, $at, $s1
subu $s0, $s0, $at
```

Kết quả:

$t6	14	0
$t7	15	0
$s0	16	4
$s1	17	-4
$s2	18	0
$s3	19	0

b. *move $s0,s1*

```
addu $s0, $zero, $s1
```

Kết quả:

$t6	14	0
$t7	15	0
$s0	16	-4
$s1	17	-4
$s2	18	0
$s3	19	0

c. *not $s0,$s1*

```
nor $s0, $s1, $zero
```

Kết quả:

$t6	14	0x00000000
$t7	15	0x00000000
$s0	16	0x00000005
$s1	17	0xfffffffa
$s2	18	0x00000000
$s3	19	0x00000000

d. *ble $s1,s2,L*

```
slt $at, $s2, $s1
beq $at, $zero, L
```

Assignment 4

```
1  .text
2  start:
3  li $t0,0 #Default $t0 = 0 no overflow
4  li $s1, 0x7fffffff
5  li $s2, 2
6  addu $s3, $s1, $s2 # s3 = s1 + s2
7  xor $t1, $s1, $s2 #Test if $s1 and $s2 have the same sign
8  bltz $t1, EXIT #If not, exit
9  xor $t2, $s3, $s1 #Test if $s1 and $s3 have the same sign
10 bgtz $t2, EXIT #Neu $t2 > 0, exit
11 j OVERFLOW
12 OVERFLOW:
13 li $t0,1 #The result is overflow
14 EXIT:
```

Khởi tạo $s1 = 0x7fffffff, $s2 = 2.

Kết quả sau chương trình:

$t0	8	0x00000001
$t1	9	0x7ffffffd
$t2	10	0xfffffffe
$t3	11	0x00000000
$t4	12	0x00000000
$t5	13	0x00000000
$t6	14	0x00000000
$t7	15	0x00000000
$s0	16	0x00000000
$s1	17	0x7fffffff
$s2	18	0x00000002
$s3	19	0x80000001

$t0 = 1, xảy ra tràn số

⇨ Kết quả đúng

Assignment 5

Khởi tạo $s0 = 8, $s1 = 15.

```
1  .text
2  li $s0,8
3  li $s1,15
4  Loop:
5  beq $s0,1,Exit #If $s0 = 1, exit
6  srl $s0,$s0,1 #shift right $s0 1 bit
7  sll $s1,$s1,1 #shift left $s1 1 bit
8  j Loop
9  Exit:
```

Kết quả sau khi kết thúc chương trình:

$s0	16	1
$s1	17	120

⇨ Kết quả đúng