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BÁO CÁO LAB04

I. Assignment 1

- TH1: Cộng 2 số khác dấu. VD: s1 = 0xffffffff; s2 = 0x7fffffff

	$t0	$s3	$t1	pc
li $t0,0	**0x00000000**	0x00000000	0x00000000	0x00400010
addu $s3,$s1,$s2	0x00000000	**0x7ffffffe**	0x00000000	0x00400014
xor $t1,$s1,$s2	0x00000000	0x7ffffffe	**0x80000000**	0x00400018
bltz $t1,EXIT	0x00000000	0x7ffffffe	0x80000000	0x00400034

- TH2: Cộng 2 số cùng dấu

  VD1: s1= 1; s2 =2

	$t0	$s3	$t1	$t2	pc
li $t0,0	**0x00000000**	0x00000000	0x00000000	0x00000000	0x0040000c
addu $s3,$s1,$s2	0x00000000	**0x00000003**	0x00000000	0x00000000	0x00400010
xor $t1,$s1,$s2	0x00000000	0x00000003	**0x00000003**	0x00000000	0x00400014
bltz $t1,EXIT	0x00000000	0x00000003	0x00000003	0x00000000	0x00400018
slt $t2,$s3,$s1	0x00000000	0x00000003	0x00000003	**0x00000000**	0x0040001c

bltz $s1,NEGATIVE	0x00000000	0x00000003	0x00000003	0x00000000	0x00400020
beq $t2,$zero,EXIT	0x00000000	0x00000003	0x00000003	0x00000000	0x00400030

VD2: s1=0x7fffffff; s2=0x7fffffff

	$t0	$s3	$t1	$t2	pc
li $t0,0	0x00000000	0x00000000	0x00000000	0x00000000	0x00400014
addu $s3,$s1,$s2	0x00000000	**0xfffffffe**	0x00000000	0x00000000	0x00400018
xor $t1,$s1,$s2	0x00000000	0xfffffffe	**0x00000000**	0x00000000	0x0040001c
bltz $t1,EXIT	0x00000000	0xfffffffe	0x00000000	0x00000000	0x00400020
slt $t2,$s3,$s1	0x00000000	0xfffffffe	0x00000000	**0x00000001**	0x00400024
bltz $s1,NEGATIVE	0x00000000	0xfffffffe	0x00000000	0x00000001	0x00400028
beq $t2,$zero,EXIT	0x00000000	0xfffffffe	0x00000000	0x00000001	0x0040002c
j OVERFLOW	0x00000000	0xfffffffe	0x00000000	0x00000001	0x00400034
li $t0,1	**0x00000001**	0xfffffffe	0x00000000	0x00000001	0x00400038

II. Assignment 2

li $s0, 0x12345678

#Extract MSB of register s0

srl $t0, $s0, 24 #t0= 0x00000012

#Clear LSB of register s0

andi $t1,$s0,0xffffff00 #t1 = 0x12345600

#Set LSB of register s0 (bits 7 to 0 are set to 1)

ori $t2,$s0,0x000000ff #t2 = 0x123456ff

#Clear register s0 (s0=0, must use logical instructions)

andi $t3,$s0,0x00000000 #t3 = 0x00000000

#Exchange MSB of register s0 with LSB

andi $s1,$s0,0x00ffff00 #s1 = 0x00345600

sll $t4,$s0,24 #t4 = 0x00000078

add $s1,$s1,$t0 #s1 = 0x00345612

add $s1,$s1,$t4 #s1 = 0x78345612

III. Assignment 3

a. abs $s0,$s1

Basic	
sra $1,$17,0x0000001f	2: abs $s0,$s1
xor $16,$1,$17	
subu $16,$16,$1	

sra: dịch phải số học $17 31 bits: các bit bằng bit ngoài cùng trái sủa $17

-> $1 = 0xffffffff nếu s1 âm; $1 = 0x00000000 nếu s1 dương

xor: Nếu s1 âm -> đảo bit; nếu dương-> giữ nguyên

subu: Trừ s1 cho $1:

Tức là $s1 âm s1 = $s1+1; s1 dương giữ nguyên

b. move $s0,$s1

-> addu $16,$0,$17 : cộng giá trị thanh ghi $s1 với $zero rồi lưu kết quả vào $s0

c. not $s0

-> nor $16,$s16,$s0: Thực hiện nor $s0 với $zero -> đảo bit

d. ble $s1,$s2,L

-> slt $1,$18,$17: Nếu $s2<$s1 thì $1 = 1; $s1<=$s2 thì $1 = 0

->beq $1,$0,x: Chuyển đến lệnh thứ x+1 nếu $1 = 0

IV. Assignment 4

```
#Laboratory Exercise 4
.text
li $s1,0x7fffffff
li $s2,0x7fffffff
start:
	li $t0,0 # No overflow is set as default status
	addu $s3,$s1,$s2 # s3 = s1 + s2
	xor $t1,$s1,$s2 # Check if $s1 and $s2 have the same sign?
	bltz $t1,EXIT # If not, exit
	xor $t2,$s3,$s1 # Check if ($s1 + $s2) and $s1 have the same sign?
	bgez $t2,EXIT #If not, overflow
OVERFLOW:
	li $t0,1 # The result overflows
EXIT:
```

V. Assignment 5

```
#Chuong trinh nhan so nguyen x voi so 2^n
li $s0,100	#x=?
li $t0,9	#n=?
li $s1,0	#i=0
loop:
	mul $s0,$s0,2	#x*2
	addi $s1,$s1,1	#i++
	bne $s1,$t0,loop #if i!=n, branch to loop
```