BÁO CÁO TUẦN 3

Bài 1:

Data segment:

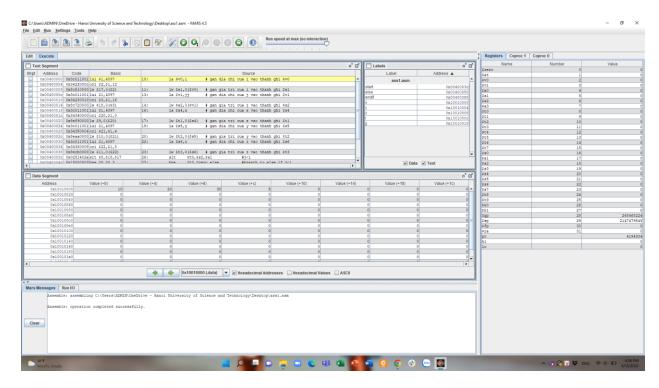
```
.data
                            #khoi tao gia tri cho x
         .word 10
х:
         .word 20
                            #khoi tao gia tri cho y
V:
                            #khoi tao gia tri cho z
z:
         .word 30
                           #khoi tao gia tri cho i
i:
         .word 5
                           #khoi tao gia tri cho jj
77:
         .word 8
  - Text segment:
.text
       la $v0,i  # gan dia chi cua i vao thanh ghi $v0
        lw $s1,0($v0) # gan gia tri cua i vao thanh ghi $s1
       la $v1,jj  # gan dia chi cua j vao thanh ghi $v1
lw $s2,0($v1)  # gan gia tri cua j vao thanh ghi $s2
        la $s4,x # gan dia chi cua x vao thanh ghi $s4
        lw $t1,0($s4) # gan gia tri cua x vao thanh ghi $t1
        la $s5,y # gan dia chi cua y vao thanh ghi $s5
        lw $t2,0($s5) # gan gia tri cua y vao thanh ghi $t2
```

la \$s6,z # gan dia chi cua z vao thanh ghi \$s6
lw \$t3,0(\$s6) # gan gia tri cua z vao thanh ghi \$t3

start:

```
slt $t0,$s2,$s1
                                    #j<i
                                    #branch to else if j<i
             $t0,$zero,else
       bne
                                    #then part: x=x+1
       addi $t1,$t1,1
       addi
             $t3,$zero,1
                                    \#z = 1
                                    #skip "else" part
             endif
       i
                                    #begin else part: y=y-1
else:
       addi
             $t2,$t2,-1
                                    #z=2*z
             $t3,$t3,$t3
       add
endif:
```

- Giải thích:
 - + Khởi tạo giá trị cho x,y,z,i,jj



+ Vì i<jj nên giá trị thanh ghi \$t0 =0 nên ở dòng lệnh bne không nhảy đến else mà sẽ thực hiện 2 dòng lệnh sau bne là x=x+1 và z=1.

Bài 2:

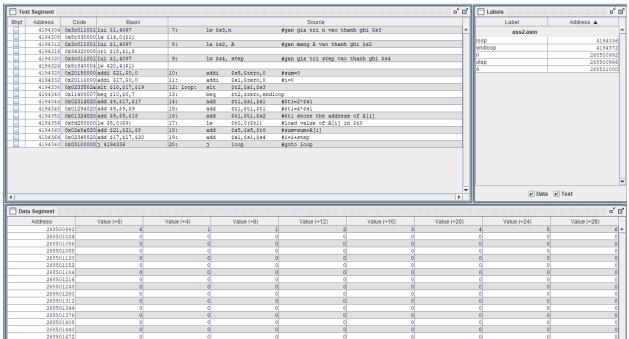
Data segment

```
.data
n: .word 6  #khoi tao gia tri n=6
step: .word 1  #khoi tao gia tri step =1
A: .word 1,2,3,4,5,6  #khoi tao mang A
```

Text segment

```
.text
                                 #gan gia tri n vao thanh ghi $s3
        lw $s3,n
                                 #gan mang A vao thanh ghi $s2
        la $s2, A
        lw $s4, step
                                 #gan gia tri step vao thanh ghi $s4
        addi
                $s5,$zero,0
                                 #sum=0
                $s1,$zero,0
        addi
                                 \#i = 0
100p:
        slt
                $t2,$s1,$s3
        beq
                $t2,$zero,endloop
        add
                $t1,$s1,$s1
                                #$t1=2*$s1
        add
                $t1,$t1,$t1
                                 #$t1=4*$s1
        add
                $t1,$t1,$s2
                                 #$t1 store the address of A[i]
                                 #load value of A[i] in $t0
        lw
                $t0,0($t1)
                $s5,$s5,$t0
        add
                                 #sum=sum+A[i]
        add
                $s1,$s1,$s4
                                 #i=i+step
        Ť.
                loop
                                 #goto loop
endloop:
```

- Result:



Registers Coproc 1	Coproc 0	
Name	Number	Value
\$zero	0	0
\$at	1	268500992
\$v0	2	0
\$v1	3	0
\$a0	4	0
\$al	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	6
\$t1	9	268501020
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$80	16	0
\$sl	17	6
\$82	18	268501000
\$83	19	6
\$84	20	1
\$85	21	21
\$86	22	0
\$87	23	0
\$t8	24	0
\$t9	25	0
\$k0	26	0
\$kl	27	0
\$gp	28	268468224
\$sp	29	2147479548
\$fp	30	0
\$ra	31	0
pc		4194372
hi		0
10		0

Nhận xét:

- Khi khởi tạo giá trị của các biến ban đầu là n = 6, A[] = [1,2,3,4,5,6], step = 1, i = 0 và sum
 = 0, chương trình chạy qua các phần tử của mảng A[1], A[2], A[3] và đọc giá trị vào
 thanh ghi \$t0 rồi cộng tổng vào thanh ghi chứa sum là \$s5.
- Giá trị của thanh ghi lưu địa chỉ phần tử A[i] cũng thay đổi theo từng step.
- Sau khi chạy xong, kết quả của thanh ghi \$s5 = 21 đúng như kết quả tính tay.

Bài 3:

- Code

```
#Laboratory Exercise 3, Assigment 3
.data
test: .word 1
.text
              $s0,test
                            #load the address of test variable
       la
       lw
               $s1,0($s0)
                            #load the value of test to register $t1
       li
              $t0,0
       li
              $t1,1
              $t2,2
       li
              $s1,$t0,case 0
       beq
              $s1,$t1,case_1
       beq
              $s1,$t2,case 2
       beq
               default
       j
case 0: addi
               $s2, $s2, 1
                             #a=a+1
               continue
       j
case 1: sub
               $s2, $s2,$t1
                             #a=a-1
               continue
       j
                              #b=2*b
case 2: add
               $3,$3,$3
               continue
       j
default:
continue:
```

lex	t Segment							□ □ □	Labels	
ot	Address	Code	Basic			Source			Label	Address ▲
			lui \$1,4097	5: 1	s \$s0, test	#load the address of	test variable		ass3.asm	
1			ori \$16,\$1,0						case 0	4194
1			lw \$17,0(\$16)	6: 1		#load the value of t	est to register \$tl		case_1	4194
1			addiu \$8,\$0,0	7: 1					case 2	4194
1			addiu \$9,\$0,1	8: 1					default	4194
l			addiu \$10,\$0,2	9: 1					continue	4194
1			beq \$17,\$8,3		eq \$s1,\$t0,case_0				est	26850
L			beq \$17,\$9,4	11: b						20000
ļ			beq \$17,\$10,5		eq \$s1,\$t2,case_2					
ļ		0x08100010		13: j	default					
ļ			addi \$18,\$18,1	14: case_0: a		#a=a+1				
1		0x08100010		15: j	continue					
ļ			sub \$18,\$18,\$9	16: case_1: s		#a=a-1				
ļ		0x08100010		17: j	continue					
l			add \$19,\$19,\$19	18: case_2: a		#b=2*b				
П	4194364	0x08100010	j 4194368	19: j	continue					
								V	☑ Data	ı 🗾 Text
at	a Segment							 	⊮ Data	ı 🗹 Text
ıt	Address		Value (+0)	Value (+4)	Value (+8)	Value (+12)	Value (+16)	Value (+20)	Value (+24)	Value (+28)
at	Address 268500	992	1	0		0 (0	Value (+20)	Value (+24)	Value (+28)
at	Address 268500 268501	0992 1024	1 0	0		0 (0	Value (+20)	Value (+24)	Value (+28)
ıt	Address 268500 268500 268500	0992 1024 1056	1 0 0	0		0 (0 0	Value (+20)	Value (+24) 0 0 0 0	Value (+28)
at	268500 268501 268501 268501	0992 1024 1056 1088	1 0 0	0 0 0		0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0	Value (+28)
ıt	Address 268500 268501 268501 268501 268501	0992 1024 1056 1088	1 0 0 0 0	0 0 0 0		0 (0 0 (0 0 (0 0 (0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0	Value (+28)
at	Address 268500 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120	0 0 0 0	0 0 0 0 0		0 (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
nt	Address 268500 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120 1152	1 0 0 0 0	0 0 0 0 0		0 (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	Address 268500 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120 1152	0 0 0 0	0 0 0 0 0		0 (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0
at	Address 268500 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120 1152 1184	1 0 0 0 0	0 0 0 0 0		0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0
at	Address 268500 268501 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120 1152 1184 1216	1 0 0 0 0 0	0 0 0 0 0 0		0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0
at	Address 268500 268501 268501 268501 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120 1152 1184 1216 1248	1 0 0 0 0 0 0 0	0 0 0 0 0 0 0		0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0
at	Address 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120 1152 1184 1216 12248 1280	1 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0		0 (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0
at	Address 26850(26850) 26850) 26850) 26850) 26850) 26850) 26850) 26850) 26850)	0992 1024 1056 1088 1120 1152 1184 1216 1248 1280 1312	1 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0		0 (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0
at	Address 268500 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501	0992 1024 1056 1088 11120 1152 1184 1216 12248 12280 1312 1312 13344	1 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0		Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) Value (+28) Value (+28) O O O O O
at	Address 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501 268501	0992 1024 1056 1088 1120 1152 1184 1216 12248 1280 1312 1344 1376 1408	1 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0		0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0		Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Registers Coproc 1	Coproc 0	
Name	Number	Value
\$zero	0	0
\$at	1	268500992
\$v0	2	0
\$vl	3	0
\$a0	4	0
\$al	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	1 2
\$t2	10	2
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$80	16	268500992
\$sl	17	1
\$s2	18	-1
\$83	19	0
\$84	20	0
\$85	21	0
\$86	22	0
\$87	23	0
\$t8	24	0
\$t9	25	0
\$k0	26	0
\$kl	27	0
\$gp	28	268468224
\$sp	29	2147479548
\$fp	30	0
\$ra	31	0
pc		4194368
hi		0
10		0

Bài 4:

a. i<j

```
#Laboratory Exercise 3, Assignment 4, i<j
.data
x:
       .word 10
                        #khoi tao gia tri cho x
                        #khoi tao gia tri cho y
        .word 20
у:
                       #khoi tao qia tri cho z
       .word 30
z:
ı:
        .word 5
                       #khoi tao gia tri cho i
                       #khoi tao gia tri cho jj
77:
       .word 8
.text
                       # gan dia chi cua i vao thanh ghi $v0
        la $v0,i
                       # gan gia tri cua i vao thanh ghi $s1
        lw $s1,0($v0)
        la $v1, jj
                       # gan dia chi cua j vao thanh ghi $v1
        lw $s2,0($v1) # gan gia tri cua j vao thanh ghi $s2
        la $s4,x
                       # gan dia chi cua x vao thanh ghi $s4
        lw $t1,0($s4) # gan gia tri cua x vao thanh ghi $t1
        la $s5,y
                       # gan dia chi cua y vao thanh ghi $s5
        lw $t2,0($s5) # gan gia tri cua y vao thanh ghi $t2
                       # gan dia chi cua z vao thanh ghi $s6
        la $s6.z
        lw $t3,0($s6) # gan gia tri cua z vao thanh ghi $t3
start:
                                        #i<i thì $t0=1
        slt
                $t0,$s1,$s2
        beq
                $t0,$zero,else
                                       #branch to else if i<j
        addi
                $t1,$t1,1
                                        #then part: x=x+1
                $t3,$zero,1
                                        \#z = 1
        addi
                                        #skip "else" part
                endif
        i.
        addi
                $t2,$t2,-1
                                        #begin else part: y=y-1
else:
                                        \#z = 2*z
        add
                $t3,$t3,$t3
endif:
```

_ Te:	t Segment								o* Ø*	Labels	o ^t
3kpt	Address	Code	Basic				Source			Label	Address ▲
	4194304	0x3c011001	l lui \$1,4097	10:	la \$v0,	i # gan di	a chi cua i vao thanh	ghi \$v0		ass4 a.asm	
	4194308	0x34220000	ori \$2,\$1,12							start	4194364
			0 lw \$17,0(\$2)	11:	lw \$s1,0	0(\$v0) # gan gi	a tri cua i vao thanh	ghi \$sl		else	4194384
	4194316	0x3c011001	l lui \$1,4097	12:	la \$vl,	jj # gan di	a chi cua j vao thanh	ghi \$vl		endif	4194304
	4194320	0x34230010	0 ori \$3,\$1,16							, sildii	268500992
			0 lw \$18,0(\$3)	13:	lw \$s2,0	0(\$v1) # gan gi	a tri cua j vao thanh	ghi \$s2		,	268500992
			l lui \$1,4097	14:	la \$s4,:	κ ∮gan di	a chi cua x vao thanh	ghi \$s4			268501000
			0 ori \$20,\$1,0								268501000
			0 lw \$9,0(\$20)	15:	lw \$t1,0	0(\$s4) # gan gi	a tri cua x vao thanh	ghi \$tl			26850100
П			l lui \$1,4097	16:	la \$85,	y # gan di	a chi cua y vao thanh	ghi \$s5		J	20030100
П	4194344	0x34350004	4 ori \$21,\$1,4								
П	4194348	0x8eaa0000	0 lw \$10,0(\$21)	17:	lw \$t2,0	0(\$s5) # gan gi	a tri cua y vao thanh	ghi \$t2			
	4194352	0x3c011001	l lui \$1,4097	18:	la \$s6,:	z # gan di	a chi cua z vao thanh	ghi \$s6			
	4194356	0x34360008	8 ori \$22,\$1,8								
П	4194360	0x8ecb0000	0 lw \$11,0(\$22)	19:	lw \$t3,0	0(\$s6) # gan gi	a tri cua z vao thanh	ghi \$t3			
	4194364	0x0232402a	a slt \$8,\$17,\$18	22:	slt	\$t0,\$s1,\$s2	#i <j \$t0="</td" thì=""><td>1</td><td></td><td></td><td></td></j>	1			
	4194368	0x11000003	3 beg \$8,\$0,3	23:	beq	\$t0,\$zero,else	#branch to el	se if i <j< td=""><td></td><td></td><td></td></j<>			
	4194372	0x21290001	l addi \$9,\$9,1	24:	addi	\$t1,\$t1,1	#then part: x	=x+1			
			l addi \$11,\$0,1	25:	addi	\$t3.\$zero.1	#z=1				
		0x08100016									
ш	4194380			26:	1	endif	∳skip "else"	part			
H											
	4194384	0x214affff	f addi \$10,\$10,-1 0 add \$11,\$11,\$11	26: 27: else: 28:		endif \$t2,\$t2,-1 \$t3,\$t3,\$t3	#skip "else" #begin else p #z=2*z				
Da	4194384	0x214affff	f addi \$10,\$10,-1	27: else:	addi	\$t2,\$t2,-1	#begin else p		V	✓ Data	✓ Text
Da	4194384 4194388	0x214affff	f addi \$10,\$10,-1	27: else:	addi	\$t2,\$t2,-1	#begin else p		Value (+20)	✓ Data Value (+24)	
Da	4194384 4194388	0x214afffi 0x016b5820	faddi \$10,\$10,-1	27: else: 28:	addi	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else p #z=2*z	art: y=y-l	Value (+20)		Value (+28)
Da	4194388 4194388 a Segment	0x214affff 0x016b5820	f addi \$10,\$10,-1 0 add \$11,\$11,\$11 Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else p #z=2*z Value (+12)	art: y=y-1 Value (+16)	Value (+20)	Value (+24)	Value (+28)
Da	4194388 4194388 a Segment Address 26850	0x214affff 0x016b5820	Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3 Value (+8)	#begin else p #z=2*z Value (+12) S	art: y=y-l Value (+16)	Value (+20)	Value (+24)	Value (+28)
Da	4194388 4194388 a Segment Address 26850 26850	0x214affff 0x016b5820 00992 01024 01056	Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3 Value (+8)	#begin else p #z=2*z Value (+12) S	value (+16)	Value (+20)	Value (+24)	Value (+28)
Da	4194384 4194388 a Segment Address 26850 26850	0x214affff 0x016b5820	Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3 Value(+8)	#begin else p #z=2*z Value (+12) 5 0	Value (+16) 8 C	Value (+20)	Value (+24)	Value (+28)
Da	4194384 4194388 a Segment Address 26850 26850 26850	0x214affff 0x016b5820 0x016b5820 00992 01024 01056 01088 01120	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add	\$t2,\$t2,\$t3 \$t3,\$t3,\$t3 Value(+8) 30 0 0 0	#begin else p #z=2*z Value (+12) 5 0 0	Value (+16) Value (+16) 0 0 0	Value (+20)	Value (+24) 0 (0 0 (0 0 (0	Value (+28)
Da	4194384 4194388 a Segment Address 26856 26856 26856 26856	0x214affff 0x016b5820 0x016b5820 00992 01024 01056 01108 01120 01152	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add	\$t2,\$t2,\$t3 \$t3,\$t3,\$t3 Value(+8) 30 0 0 0	#begin else p #z=2*z Value (+12) 5 0 0 0	Value (+16) 8 0 0 0	Value (+20)	Value (+24) 0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	Value (+28)
Da	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5820 0x016b5820 0x0992 0x0992 0x0992 0x0992 0x0992 0x1024 0x1026 0x106 0x10	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add	Value (+8) 0 0 0 0 0 0 0 0 0	#begin else p #z=2*z Value (+12) S 0 0 0 0 0 0	Value (+16) Value (+16) C C C C C C C	Value (+20)	Value (+24) 0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	Value (+28)
Da	4194384 4194388 a Segment Address 26856 26856 26856 26856 26856 26856 26856	0x214affff 0x016b5820 0x016b5820 000992 01024 01056 01088 01120 01152 01184 01216	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 20 0 0 0 0	Value (+8) 0 0 0 0 0 0 0 0 0	#begin else p #z=2*z Value(+12) 5 0 0 0 0 0 0	Value (+16) Value (+16) C C C C	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
Da	4194384 4194388 Address 26856 26856 26856 26856 26856 26856 26856 26856	0x214affff 0x016b5820 0x016b5820 000992 01024 01056 01088 01152 01152 01152 01152 01152 01216 01216	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 20 0 0 0 0 0	Value (+8) 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#begin else p #2-2*z Value (+12) 5 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
Da	a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	00992 00992 01024 01056 01120 01152 01184 01216 01248 01280	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 20 20 0 0 0 0 0	Value (+8) Value (+8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#begin else p #2=2*2 Value(+12) 5 0 0 0 0 0 0 0 0	Value (+16) Value (+16) C C C C C C C C C C C C C	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
Da	a Segment Address 26856 26856 26856 26856 26856 26856 26856 26856 26856 26856 26856	0x214affff 0x016b5826 00992 01024 01056 01088 01152 01152 01152 01216 01248 01248 01280 01312	Value (+0) Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 200 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+8) Value (+8) 0 0 0 0 0 0 0 0 0 0	#begin else p #2-2*z Value (+12) S 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 6 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
Da	4194384 4194388 a Segment a Segment	0x214affff 0x01cb5226 000992 01024 01056 01088 01120 01152 01184 01220 01216 01228 01228 01312	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 20 20 0 0 0 0 0 0 0 0 0	Value (+8) Value (+8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#begin else p #2=2*2 Value(+12) 5 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
Da	4194384 4194388 a Segment Address 26850 2685	0x214affff 0x01cb5e2c 000992 01024 01056 01088 01120 01152 01124 01246 01240	Value (+0) Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 20 20 0 0 0 0 0 0 0 0 0	Value (+8) Value (+8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#begin else p #5=2*z Value (+12) 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 8 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0	Value (+28)
Da	4194384 4194388 a Segment 3 Address 26850 268	0x214affff 0x016b5820 000992 01024 01056 01120 01182 01184 01216 01228 01344 01376 01408	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 200 200 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+8) Value (+8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#begin else p #==2°z Value(+12) 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 6 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)

Registers	Coproc 1	Coproc 0		
Na	ame	N	umber	Value
\$zero			0	0
\$at			1	268500992
\$v0			2	268501004
\$vl			3	268501008
\$a0			4	0
\$al			5	0
\$a2			6	0
\$a3			7	0
\$t0			8	1
\$t1			9	11
\$t2			10	20
\$t3			11	1
\$t4			12	0
\$t5			13	0
\$t6			14	0
\$t7			15	0
\$80			16	0
\$sl			17	5
\$82			18	8
\$83			19	0
\$84			20	268500992
\$85			21	268500996
\$86			22	268501000
\$87			23	0
\$t8			24	0
\$t9			25	0
\$k0			26	0
\$kl			27	0
\$gp			28	268468224
\$sp			29	2147479548
\$fp			30	0
\$ra			31	0
pc				4194392
hi				0
10				0

b. i>=j Code:

```
#Laboratory Exercise 3, Assignment 4, i>=j
.data
       .word 10
                       #khoi tao gia tri cho x
x:
       .word 20
                       #khoi tao gia tri cho y
у:
       .word 30
                       #khoi tao qia tri cho z
z:
       .word 5
                       #khoi tao qia tri cho i
i:
77:
       .word 8
                       #khoi tao gia tri cho jj
.text
       la $v0,i
                       # gan dia chi cua i vao thanh ghi $v0
        lw $s1,0($v0)
                      # gan gia tri cua i vao thanh ghi $s1
                       # gan dia chi cua j vao thanh ghi $v1
        la $v1, jj
        lw $s2,0($v1)
                       # gan gia tri cua j vao thanh ghi $s2
                       # gan dia chi cua x vao thanh ghi $s4
        la $s4,x
        lw $t1,0($s4)
                       # gan gia tri cua x vao thanh ghi $t1
                       # gan dia chi cua y vao thanh ghi $s5
        la $s5,y
        lw $t2,0($s5)
                      # gan gia tri cua y vao thanh ghi $t2
                       # gan dia chi cua z vao thanh ghi $s6
        la $s6,z
        lw $t3,0($s6) # gan gia tri cua z vao thanh ghi $t3
start:
                                       #i<i thì $t0=1
        slt
               $t0,$s2,$s1
        beg
               $t0,$zero,else
                                       #branch to else if i<j
               $t1,$t1,1
                                       #then part: x=x+1
        addi
        addi
               $t3,$zero,1
                                       \#z = 1
               endif
                                       #skip "else" part
else:
        addi
               $t2,$t2,-1
                                       #begin else part: y=y-1
        add
               $t3,$t3,$t3
                                       #z=2*z
endif:
```

cpt	Address	Code	Basic				Source			Label	Address A
		0x3c011001		10:	la şv),i ∮gan	dia chi cua i vao than	h ghi \$v0	_	ass4 b.asm	
Т			ori \$2,\$1,12							start	41
Ι			lw \$17,0(\$2)	11:	lw \$s	L,0(\$v0) ∮ gan	gia tri cua i vao than	h ghi \$sl		else	43
Ι		0x3c011001		12:	la \$v	l,jj # gan	dia chi cua j vao than	h ghi \$vl		endif	4.
			ori \$3,\$1,16							v	2685
1			lw \$18,0(\$3)	13:			gia tri cua j vao than			v v	268
		0x3c011001		14:	la \$s	l,x ∮gan	dia chi cua x vao than	h ghi \$s4		7	268
1			ori \$20,\$1,0							i	268
1			lw \$9,0(\$20)	15:			gia tri cua x vao than			ii	268
1		0x3c011001		16:	la \$s	y # gan	dia chi cua y vao than	h ghi \$s5			200
1			ori \$21,\$1,4								
4			lw \$10,0(\$21)	17:			gia tri cua y vao than				
4		0x3c011001		18:	la \$s	6,z ∦gan	dia chi cua z vao than	h ghi \$s6			
+			ori \$22,\$1,8								
+			lw \$11,0(\$22)	19:			gia tri cua z vao than				
+			slt \$8,\$18,\$17	22:	slt	\$t0,\$s2,\$s1	#j <i \$t0<="" td="" thi=""><td></td><td></td><td></td><td></td></i>				
+		0x11000003	beq \$8,\$0,3 addi \$9,\$9,1	23:	beq	\$t0,\$zero,els					
+				24:	addi	\$t1,\$t1,1	#then part:	x=x+1			
+		0x08100016	addi \$11,\$0,1		addi	\$t3,\$zero,1					
+				26:	j	endif	#skip "else"				
+	4194384	0x214affff	addi \$10,\$10,-1	27: else:	addi	\$t2,\$t2,-1	#begin else				
İ	4194384	0x214affff									
	4194384 4194388	0x214affff	addi \$10,\$10,-1	27: else:	addi	\$t2,\$t2,-1	#begin else		V	✓ Data	☑ Text
at	4194384 4194388 a Segment	0x214affff 0x016b5820	addi \$10,\$10,-1 add \$11,\$11,\$11	27: else: 28:	addi	\$t2,\$t2,-1 \$t3,\$t3,\$t3	∯begin else ∯z=2°z	part: y=y-l			
at	4194384 4194388 a Segment	0x214affff 0x016b5820	addi \$10,\$10,-1 add \$11,\$11,\$11	27: else:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12)		▼ ▶ Value (+20)	Value (+24)	Value (+28)
at	4194384 4194388 a Segment Address 26850	0x214affff 0x016b5820	Addi \$10,\$10,-1 add \$11,\$11,\$11 Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12)	Part: y=y-1 Value (+16) 8	Value (+20)	Value (+24)	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850	0x214affff 0x016b5820	Addi \$10,\$10,-1 add \$11,\$11,\$11 Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2°z Value (+12)	Value (+16)	Value (+20)	Value (+24) 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850	0x214affff 0x016b5820	Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0	Value (+16)	Value (+20)	Value (+24) 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850	0x214affff 0x016b5820	addi \$10,\$10,-1 add \$11,\$11,\$11 Value (+0) 10 0 0 0	27: else: 28:	addi add 20 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0	Value (+16) S 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850	0x214affff 0x016b5820	Value (+0)	27: else: 28:	addi add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0 0 0	Value (+16) Value (+16) 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850	0x214affff 0x016b5920 00992 01024 01056 01088 011120 01152	Value (+0) 10 0 0 0 0 0 0	27: else: 28:	addi add 20 0 0 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) S 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5920 00992 01024 01088 01120 01152 01184	Value (+0) Value (+0) 0 0 0 0 0 0 0	27: else: 28:	addi add 20 0 0 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0 0 0 0	Value (+16) Value (+16) 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5920 00992 01024 01056 01088 01120 01182 01184 01184	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	addi add 20 0 0 0 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5820 00992 11024 11056 11088 11120 11152 11184 01216	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	add1 add add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 8 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5820 00992 01024 01056 01068 01120 01152 01184 01248 01248	Value (+0) Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	add1 add add 20 20 0 0 0 0 0 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5920 00992 00992 010024 01056 01088 01152 01152 01152 01152 01246 01248 01248 01248 01312	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	add1 add add	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5820 00092 11024 11036 11120 11152 11124 11246 11249 11240 11312 11314	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	add1 add add 20 20 0 0 0 0 0 0 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5820 00992 11024 11056 11088 11120 11120 11121 11246 11246 11248 11312 11314 11312 11314	Value (+0) Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	add1 add add 20 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) S S S S S S S S S S S S S S S S S S S	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)
at	4194384 4194388 a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0x214affff 0x016b5820 00992 11024 11056 11120 11121 11216 11242 11242 11242 11344 11376 11377	Value (+0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27: else: 28:	add1 add add 220 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$t2,\$t2,-1 \$t3,\$t3,\$t3	#begin else #z=2*z Value (+12) Value (+12) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+16) Value (+16) 8 0 0 0 0 0 0 0 0 0 0 0 0	Value (+20)	Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28)

Registers	Coproc 1	Coproc 0		
Na	ıme	N	umber	Value
\$zero			0	0
\$at			1	268500992
\$v0			2	268501004
\$v1			3	268501008
\$a0			4	0
\$al			5	0
\$a2			6	0
\$a3			7	0
\$t0			8	0
\$t1			9	10
\$t2			10	19
\$t3			11	60
\$t4			12	0
\$t5			13	0
\$t6			14	0
\$t7			15	0
\$80			16	0
\$sl			17	5
\$s2			18	8
\$83			19	0
\$84			20	268500992
\$85			21	268500996
\$86			22	268501000
\$87			23	0
\$t8			24	0
\$t9			25	0
\$k0			26	0
\$kl			27	0
\$gp			28	268468224
\$sp			29	2147479548
\$fp			30	0
\$ra			31	0
pc				4194392
hi				0
10				0

c. i+j<=0

```
#Laboratory Exercise 3, Assignment 4, i+j<=0
.data
       .word 10
                        #khoi tao gia tri cho x
\mathbf{x}:
       .word 20
                        #khoi tao gia tri cho y
у:
                       #khoi tao gia tri cho z
       .word 30
z:
                       #khoi tao gia tri cho i
i:
       .word 5
       .word 8
                        #khoi tao qia tri cho jj
j j :
.text
                   # gan dia chi cua i vao thanh ghi $v0
        la $v0,i
                       # gan gia tri cua i vao thanh ghi $s1
        lw $s1,0($v0)
        la $v1, j j
                       # gan dia chi cua j vao thanh ghi $v1
        lw $s2,0($v1)
                       # gan gia tri cua j vao thanh ghi $s2
        la $s4,x
                       # gan dia chi cua x vao thanh ghi $s4
        lw $t1,0($s4)
                      # gan gia tri cua x vao thanh ghi $t1
        la $s5,y
                       # gan dia chi cua y vao thanh ghi $s5
        lw $t2,0($s5) # gan gia tri cua y vao thanh ghi $t2
                       # gan dia chi cua z vao thanh ghi $s6
        la $s6,z
        lw $t3,0($s6) # gan gia tri cua z vao thanh ghi $t3
        add $s6,$s1,$s2 # tinh tong i+jj
start:
        slt
                $t0,$0,$s6
                                        #0<tong thì $t0=1
        bne
                $t0,$zero,else
                                       #neu $t0 =0 thi else
        addi
               $t1,$t1,1
                                        #then part: x=x+1
        addi
               $t3,$zero,1
                                       \#z = 1
                                        #skip "else" part
                endif
        j.
else:
        addi
               $t2,$t2,-1
                                       #begin else part: y=y-1
        add
                $t3,$t3,$t3
                                       \#z = 2*z
endif:
```

		e Basic				Source			Label		Address
		1001 lui \$1,4097	10:	la \$v0,:	i # gan di	la chi cua i vao thanh ghi	. \$v0	_	as	s4 c.asm	
		000c ori \$2,\$1,12							start	_	
		0000 lw \$17,0(\$2)	11:	lw \$sl,		a tri cua i vao thanh ghi			else		
		1001 lui \$1,4097	12:	la \$v1,	jj # gan di	la chi cua j vao thanh ghi	\$vl		endif		
		0010 ori \$3,\$1,16							v		
		0000 lw \$18,0(\$3)	13:	lw \$s2,0		a tri cua j vao thanh ghi			III v		
		1001 lui \$1,4097	14:	la \$s4,1	c # gan di	la chi cua x vao thanh ghi	\$84		7		
		0000 ori \$20,\$1,0							11:		
		0000 lw \$9,0(\$20)	15:	lw \$tl,(la tri cua x vao thanh ghi			III .		
		1001 lui \$1,4097	16:	la \$85,	/ # gan di	la chi cua y vao thanh ghi	\$85		111		
		0004 ori \$21,\$1,4							II		
	4194348 0x8eaa	0000 lw \$10,0(\$21)	17:	lw \$t2,0)(\$s5) # gan gi	a tri cua y vao thanh ghi	\$t2		II		
		1001 lui \$1,4097	18:	la \$56,	z # gan di	la chi cua z vao thanh ghi	\$86		II		
	4194356 0x3436	0008 ori \$22,\$1,8									
		0000 lw \$11,0(\$22)	19:	lw \$t3,0)(\$s6) # gan gi	a tri cua z vao thanh ghi	\$t3				
	4194364 0x0232	b020 add \$22,\$17,\$18	20:	add \$s6,	\$s1,\$s2 # tinh t	ong i+jj			II		
	4194368 0x0016	402a slt \$8,\$0,\$22	22:	slt	\$t0,\$0,\$s6	#0 <tong \$t0="1</td" thì=""><td></td><td></td><td>II</td><td></td><td></td></tong>			II		
	4194372 0x1500	0003 bne \$8,\$0,3	23:	bne	\$t0,\$zero,else	#neu \$t0 =0 thi e	lse		II		
	4194376 0v2129	0001 addi \$9,\$9,1	24:	addi	\$t1,\$t1,1	#then part: x=x+1			II		
		0001 addi \$11,\$0,1	25:		\$t3,\$zero,1	#z=1			II		
		0001 addi \$11,\$0,1	25: 26:		\$t3,\$zero,1 endif						
	4194380 0x200h 4194384 0x0810 4194388 0x214a	0001 addi \$11,\$0,1	26: 27: else:	addi j		#z=1					
	4194380 0x200h 4194384 0x0810 4194388 0x214a	0001 addi \$11,\$0,1 0017 j 4194396 ffff addi \$10,\$10,-1	26: 27: else:	addi j addi	endif \$t2,\$t2,-1	#z=1 #skip "else" part #begin else part:				✓ Data	☑ Text
_	4194380 0x200i 4194384 0x081i 4194380 0x214i 4194392 0x016i	0001 addi \$11,\$0,1 0017 j 4194396 fffff addi \$10,\$10,-1 5820 add \$11,\$11,\$11	26: 27: else: 28:	addi j addi	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3	#z=1 #skip "else" part #begin else part: #z=2*z	y=y-1		Value		
_	4194380 0x200i 4194384 0x081i 4194388 0x2144 4194392 0x016i a Segment	0001 addi \$11,\$0,1 0017] 4194396 fffff addi \$10,\$10,-1 5820 add \$11,\$11,\$11	26: 27: else:	addi j addi add	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3	#z=1 #skip "else" part #begin else part: #z=2*z Value (+12)	y=y-1 Value (+16)	Value (+20)	Value	(+24)	
_	4194380 0x200i 4194384 0x081i 4194388 0x2144 4194392 0x016i a Segment Address 268500992	0001 addi \$11,\$0,1 0017] 4194396 ffff[addi \$10,\$10,-1 5820 add \$11,\$11,\$11 Value(+0)	26: 27: else: 28:	addi j addi add	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value (+8)	#z=1 #skip "else" part #begin else part: #z=2*z Value(+12)	y=y-1 Value (+16)	Value (+20)	0	(+24)	
_	4194380 0x2001 4194384 0x0811 4194388 0x2144 4194392 0x0161 a Segment Address 268500992 268501024	0001 adds 611,60,1 0017 3 4194396 fffff addi \$10,\$10,-1 5820 add \$11,\$11,\$11 Value (+0) 10	26: 27: else: 28:	addi j addi add	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value(+8) 30 0	#==1 #skip "else" part #begin else part: #z=2"z Value (+12) 5 0	y=y-1 Value (+16)	Value (+20) 8 0	0	(+24) 0 0	Z Text Value (
_	4194380 0x200t 4194384 0x831t 4194380 0x214t 4194392 0x016t a Segment Address 268500992 268501024 268501056	0001 addi fil, f0, 1 0017 3 4194396 fffff addi fil, f10, f10, -11 5820 add f11, f11, f11 Value (+0) 10 0	26: 27: else: 28:	addi j addi add	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value (+8) 30 0 0	#z=1 #skip "else" part #begin else part: #z=2*z Value(+12) 5 0 0	y=y-1 Value (+16)	Value (+20) 8 0	0 0	(+24) 0 0 0	
_	4194380 0x2001 4194384 0x0810 4194388 0x2144 4194392 0x0161 a Segment Address 268501024 268501024 268501056 268501088	0001 addi 011,00,1 0017 4194396 ffff[addi 010,010,-1 5820 add 011,011,011 Value(+0) 10 0 0 0	26: 27: else: 28:	addi j addi add	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value(+8) 30 0 0 0	#s-1 #skip "else" part: #begin else part: #z=2"z Value(+12) S 0 0 0	y=y-1 Value (+16)	Value (+20) 8 0 0	0 0 0	(+24) 0 0 0 0	
_	4194380 0x2001 4194384 0x081t 4194388 0x214t 4194392 0x016t a Segment Address 268501024 268501026 268501088 268501120	0001 addi 011,00,1 0017] 4194396 fffffaddi 010,010,-1 920add 011,011,011 Value (+0)	26: 27: else: 28:	addi j addi add	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value(+8) 30 0 0 0 0	#s-1 #skip "else" part #begin else part: #z-2*z Value (+12)	y=y-1 Value (+16)	Value (+20) 8 0 0 0	0 0 0 0	(+24) 0 0 0 0 0	
_	4194380 0x2001 4194384 0x0816 4194388 0x2144 4194392 0x0161 a Segment Address 268501024 268501026 268501088 268501120 268501120 268501120	0001 addi 611,80,1 0017] 4194396 fffff addi 610,610,-1 5820 addi 611,611,611 Value (+0) 10 0	26: 27: else: 28:	addi j addi add	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value(+8) 30 0 0 0 0 0	#s-1 #skip "else" part: #begin else part: #z=21z Value(+12) 5 0 0 0 0 0 0	y=y-1 Value (+16)	Value (+20)	0 0 0 0	(+24) 0 0 0 0	
_	4194380 0x2000 4194384 0x0811 4194388 0x2144 4194382 0x0161 a Segment Address 268501024 268501024 268501026 268501120 268501122 268501120 268501120	0001 addi 011,00,1 0017	26: 27: else: 28:	addi j addi add 20 0 0 0 0	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value(+8) 0 0 0 0 0	#s-1 #skip "else" part #begin else part: #2-2-2	y=y-1 Value (+16)	Value (+20) 8 0 0 0 0 0 0	0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0	
_	4194380 0x2001 4194380 0x0161 4194380 0x0161 4194380 0x0161 268501081 268501024 268501024 268501082 268501082 268501120 268501124 268501124 268501124 268501124	0001addi 11,20,1 0001addi 11,20,1 0017j 119496 ffff addi 210,210,-1 5820add 211,611,611 0 0 0 0 0 0 0 0	26: 27: else: 28:	addi j addi add 20 0 0 0 0	endif \$t2,\$t2,-1 \$t3,\$t3,\$t3 Value (+8) 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#s-1 #skip "else" part: #begin else part: #z-2"z Value(+12) 5 0 0 0 0 0 0 0 0 0	y=y-1 Value (+16)	Value (+20) 8 0 0 0 0 0 0 0 0	0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0	
_	4194380 0x2004 4194380 0x204 4194380 0x214 4194380 0x2004 419400 0x2004 419400 0x2004 419400	0001 addi 011,00,1 0001 addi 011,00,1 0017	26: 27: else: 28:	addi j addi add 20 0 0 0 0 0	endif \$42,542,-1 \$43,643,643 \$43,643,643 \$40 0 0 0 0 0 0 0 0 0	#s-1 #skip "else" part #begin else part: #2-2*2 Value (+12)	y=y-1 Value (+16)	Value (+20) 8 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0	
_	4194380 0x2014 4194381 0x214 4194382 0x214 4194382 0x214 4194392 0x0161 Address 26550192 265501024 265501028 265501122 265501124 265501126 265501126 265501126 265501126	0001addi 011,00,1 0001addi 011,00,1 0017j 419496 fffff addi 010,010,-1 5820add 011,011,011 0 0 0 0 0 0 0 0 0 0 0	26: 27: else: 28:	addi	endif. 602,602,603,603 Value (+8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#s-1 #skip "else" part: #begin else part: #2-2*z Value (+12) 0 0 0 0 0 0 0 0 0 0	y=y-1 Value (+16)	Value (+20) 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0 0	
_	4194380 0x200 4194380 0x2014 4194382 0x214 4194382 0x214 4194382 0x0161 a Segment Address 268501024 268501026 268501026 268501220 268501220 268501220 268501240 268501240 268501240 268501240 268501240 268501240 268501240	0001 adds 911, 90,1 0001 adds 910,910,-1 95820 add 910,910,-1 9000 0 0000 0 0000 0 0000 0 0000 0 0000 0 0000 0 0000 0	26: 27: else: 28:	addi j addi add 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Page 1	#s-1 #skip "else" part: #begin else part: #2-2"z Value (+12) Value (+12) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	y=y-1 Value (+16)	Value (+20)	0 0 0 0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0 0 0	
_	4194380 0x2014 4194381 0x2014 4194382 0x214 4194382 0x214 4194392 0x0161 Address 265501924 265501024 265501126 265501126 265501126 265501216 265501216 265501216 265501212 265501212 265501324	0001addi 011,00,1 0001addi 011,00,1 0017] 419496 fffff addi 010,010,-1 5820add 011,011,011 0 0 0 0 0 0 0 0 0 0 0 0 0 0	26: 27: else: 28:	addi j addi add 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	endif. Value (+8) Value (+8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0	# == 1 # skip == lse part: # begin else part: # 2=2*z Value (+12)	y=y-1 Value (+16)	Value (+20)	0 0 0 0 0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0 0	
_	4194380 0x201 4194381 0x201 4194382 0x214 4194382 0x214 4194382 0x214 4194382 0x214 4194382 0x214 265501024 265501024 265501152 265501152 265501152 265501164 265501240 265501240 265501312 265501312 265501344 265501344 265501344	0001 add1 e11, e0,1 0001 add1 e11, e0,1 0017] 418456 ffff add1 e10, e10, e1 5820 add e11, e11, e11 Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	26: 27: else: 28:	addi J addi add 20 0 0 0 0 0 0 0 0	Page 1	#s-1 #skip "else" part: #begin else part: #begin else part: #s-2"z Value (+12)	y=y-1 Value (+16)	Value (+20)	0 0 0 0 0 0 0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
_	4194380 (az20) 4194381 (az20) 4194382 (az214) 4194382 (az214) 4194382 (az214) 4194382 (az214) 4194382 (az214) 426501024 426501024 426501024 426501024 426501122 426501122 426501122 426501124 426501240 426501124 426501250 426501124 426501240 426501240 426501240 426501344 426501344	0001addi 11,20,1 0001addi 11,20,1 0017j 119496 ffff addi 210,210,-1 5820add 211,611,611 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	26: 27: else: 28:	addi addi add 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Paddie (+8) Value (+8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#s-1 #skip "else" part: #begin else part: #2-2'z Value (+12) 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	y=y-1 Value (+16)	Value (+20) 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0 0 0 0 0	
_	4194380 0x201 4194381 0x201 4194382 0x214 4194382 0x214 4194382 0x214 4194382 0x214 4194382 0x214 265501024 265501024 265501152 265501152 265501152 265501164 265501240 265501240 265501312 265501312 265501344 265501344 265501344	0001 add1 e11, e0,1 0001 add1 e11, e0,1 0017] 418456 ffff add1 e10, e10, e1 5820 add e11, e11, e11 Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	26: 27: else: 28:	addi J addi add 20 0 0 0 0 0 0 0 0	Page 1	# = 1 # # # # # # # # #	y=y-1 Value (+16)	Value (+20)	0 0 0 0 0 0 0 0 0 0 0 0	(+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

Registers	Coproc 1	Coproc 0		
Nan	ne	N	lumber	Value
\$zero			0	0
\$at			1	268500992
\$v0			2	268501004
\$v1			3	268501008
\$a0			4	0
\$al			5	0
\$a2			6	0
\$a3			7	0
\$t0			8	1
\$t1			9	10
\$t2			10	19
\$t3			11	60
\$t4			12	0
\$t5			13	0
\$t6			14	0
\$t7			15	0
\$80			16	
\$sl			17	5
\$s2			18	8
\$83			19	0
\$84			20	268500992
\$85			21	268500996
\$86			22	13
\$87			23	0
\$t8			24	0
\$t9			25	0
\$k0			26	0
\$kl			27	0
\$gp			28	268468224
\$sp			29	2147479548
\$fp			30	0
\$ra			31	0
pc				4194396
hi				0
10				0

d. i+j>m+n Code:

```
.data
х:
        .word 10
                       #khoi tao qia tri cho x
                        #khoi tao gia tri cho y
        .word 20
у:
        .word 30
                        #khoi tao gia tri cho z
z:
i:
        .word 5
                        #khoi tao gia tri cho i
                        #khoi tao gia tri cho jj
j j :
        .word 8
.text
                                #khoi tao gia tri cho m
        addi $k0,$zero,10
                               #khoi tao gia tri cho n
        addi $k1,$zero,12
        la $v0,i
                        # gan dia chi cua i vao thanh ghi $v0
        lw $s1,0($v0)
                       # gan gia tri cua i vao thanh ghi $s1
        la $v1, jj
                        # gan dia chi cua j vao thanh ghi $v1
        lw $s2,0($v1)
                       # gan gia tri cua j vao thanh ghi $s2
        la $s4,x
                       # gan dia chi cua x vao thanh ghi $s4
        lw $t1,0($s4)
                       # gan gia tri cua x vao thanh ghi $t1
        la $s5,y
                       # gan dia chi cua y vao thanh ghi $s5
        lw $t2,0($s5) # gan gia tri cua y vao thanh ghi $t2
        la $s6,z
                       # gan dia chi cua z vao thanh ghi $s6
        lw $t3,0($s6) # gan gia tri cua z vao thanh ghi $t3
        add $s6,$s1,$s2 # tinh tong i+jj
        add $s7,$k0,$k1 # tinh tong m+n
start:
                                         \#m+n< i+j thì $t0=1
        slt
                $t0,$s7,$s6
                $t0,$zero,else
                                         #$t0=0 thi else
        beq
        addi
                $t1,$t1,1
                                         #then part: x=x+1
        addi
                $t3,$zero,1
                                         \#z=1
                                         #skip "else" part
        i.
                endif
                                        #begin else part: y=y-1
else:
        addi
                $t2,$t2,-1
        add
                $t3,$t3,$t3
                                         \#z = 2*z
endif:
```

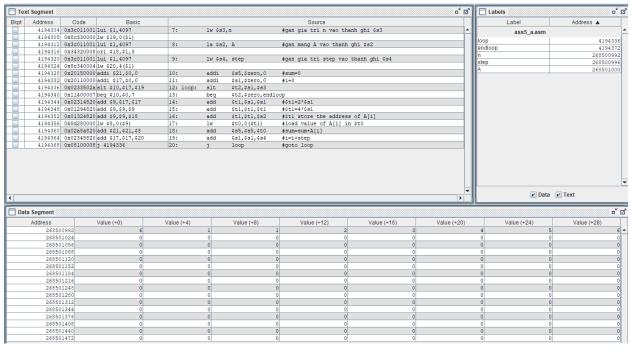
	ct Segment								ਾਂ ⊠ੋ	Labels	o'
Bkpt	Address	Code	Basic				Source			Label	Address A
			addi \$26,\$0,10	9:	addi \$k0,\$zer	0,10 #	khoi tao gia tri cho	m	A	ass4 d.asm	
	4194308	0x201b000c	addi \$27,\$0,12	10:	addi \$kl,\$zer		khoi tao gia tri cho			start	419438
			lui \$1,4097	11:	la \$v0,i	# gan dia	chi cua i vao thanh	ghi \$v0		else	419440
П	4194316	0x3422000c	ori \$2,\$1,12							endif	419440
	4194320	0x8c510000	lw \$17,0(\$2)	12:	lw \$s1,0(\$v0)	# gan gia	tri cua i vao thanh	ghi \$sl		endii	26850099
			lui \$1,4097	13:	la \$vl,jj	# gan dia	chi cua j vao thanh	ghi \$vl		<u>^</u>	26850099
П			ori \$3,\$1,16							y	26850099
П	4194332	0x8c720000	lw \$18,0(\$3)	14:	lw \$s2,0(\$v1)	# gan gia	tri cua j vao thanh	ghi \$s2		<u> </u>	26850100
П	4194336	0x3c011001	lui \$1,4097	15:	la \$s4,x	# gan dia	chi cua x vao thanh	ghi \$s4		<u>.</u>	26850100
T	4194340	0x34340000	ori \$20,\$1,0							Ш	26850100
T	4194344	0x8e890000	lw \$9,0(\$20)	16:	lw \$t1,0(\$s4)	# gan gia	tri cua x vao thanh	ghi \$tl			
T	4194348	0x3c011001	lui \$1,4097	17:	la \$s5,y	# gan dia	chi cua y vao thanh	ghi \$s5			
T			ori \$21,\$1,4								
T	4194356	0x8eaa0000	lw \$10,0(\$21)	18:	lw \$t2,0(\$s5)	# gan gia	tri cua y vao thanh	ghi \$t2			
T	4194360	0x3c011001	lui \$1,4097	19:	la \$s6,z	# gan dia	chi cua z vao thanh	ghi \$s6			
T	4194364	0x34360008	ori \$22.\$1.8								
T	4194368	0x8ecb0000	lw \$11,0(\$22)	20:	lw \$t3,0(\$s6)	# gan gia	tri cua z vao thanh	ghi \$t3			
T	4194372	0x0232b020	add \$22,\$17,\$18	21:	add \$86,\$81,\$	s2 # tinh to	ng i+jj				
Ť			add \$23,\$26,\$27	22:	add \$s7,\$k0,\$	kl # tinh to	ng m+n				
Ť	4194380	0x02f6402a	slt \$8,\$23,\$22	24:		37,\$86	#m+n <i+j td="" thi<=""><td>\$t0=1</td><td></td><td></td><td></td></i+j>	\$t0=1			
Ť	4194384	0x11000003	beg \$8,\$0,3	25:	beq \$t0,\$	zero,else	#\$t0=0 thi el		-		
T	4194388	0x21290001	addi \$9,\$9,1	26:	addi \$t1,\$	t1,1	#then part: x	=x+1			
T			addi \$11,\$0,1	27:	addi \$t3,\$	zero,1	#z=1		-		
_	1101000										
									Þ	<u> </u> Data	a ☑ Text
at	ta Segment			lee						₽ Data	_
at	a Segment Address		Value (+0)	Value (+4)	Value		Value (+12)	Value (+16)	Value (+20)	Value (+24)	Value (+28)
at	Address	0992	Value (+0)	Value (+4)	20	30	5	8		Value (+24)	_
at	Address 26850 26850	0992 1024	Value (+0)	Value (+4)	20 0	30		Value (+16) 8		Value (+24)	Value (+28)
11	Address 26850 26850 26850	0992 1024 1056	Value (+0) 10 0 0	Value (+4)	20 0 0	30 0 0	5 0 0	8 0 0		Value (+24) 0 0 0	Value (+28)
11	Address 26850 26850 26850 26850 26850	0992 1024 1056 1088	Value (+0) 10 0 0 0 0	Value (+4)	20 0 0 0	30 0 0	5 0 0	8 0 0		Value (+24) 0 0 0 0 0	Value (+28)
at	Address 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088	Value (+0) 10 0 0 0 0 0 0	Value (+4)	20 0 0 0 0	30 0 0 0	5 0 0 0	8 0 0 0		Value (+24) 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0
at	Address 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120	Value (+0) 10 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0	30 0 0 0 0	5 0 0 0 0	8 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0	Value (+28)
al	Address 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152	Value (+0) 10 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0	30 0 0 0 0 0	5 0 0 0 0	8 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0	30 0 0 0 0 0 0	5 0 0 0 0 0	8 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
a	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0 0	30 0 0 0 0 0 0 0	5 0 0 0 0 0 0	8 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
a	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216 1248 1228	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0 0	30 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0	8 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
a	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216 1248 1280 1332	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0 0 0 0	30 0 0 0 0 0 0 0	5 0 0 0 0 0 0	8 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
a	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216 1248 1280 1312 1312	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0 0 0 0	30 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0	8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) Value (+28) Value (+28) Value (+28) O O O O O O O O O O O O O
a	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216 1248 1280 1312 1344 1376	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0 0 0 0 0 0	30 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0	B 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Ja'	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216 1248 1280 1312 1344 1376	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0 0 0 0 0 0	30 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0	8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) Value (+28) Value (+28) Value (+28) O O O O O O O O O O O O O
Da	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	0992 1024 1056 1088 1120 1152 1184 1216 1248 1248 1312 1344 1376 1408	Value (+0) 10 0 0 0 0 0 0 0 0 0 0 0 0	Value (+4)	20 0 0 0 0 0 0 0 0 0 0 0 0	30 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0	8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Registers Coproc 1	Coproc 0	
Name	Number	Value
\$zero	0	0
\$at	1	268500992
\$v0	2	268501004
\$v1	3	268501008
\$a0	4	0
\$al	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	10
\$t2	10	19
\$t3	11	60
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$80	16	0
\$sl	17	5 8
\$s2	18	8
\$s3	19	0
\$84	20	268500992
\$85	21	268500996
\$86	22	13
\$87	23	22
\$t8	24	0
\$t9	25	0
\$k0	26	10
\$kl	27	12
\$gp	28	268468224
\$sp	29	2147479548
\$fp	30	0
\$ra	31	0
pc		4194408
hi		0
10		0

Bài 5:

a. i<n

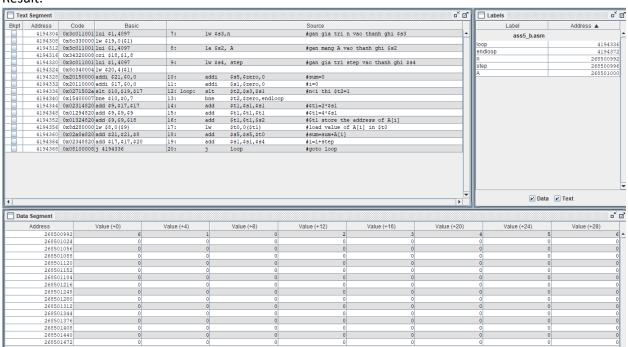
```
#Laboratory Exercise 3, Assignment 5,i<n
.data
n:
        .word 6
                                         #khoi tao gia tri n=6
                                         #khoi tao qia tri step =1
step:
        .word 1
        .word 1,2,3,4,5,6
A:
                                 #khoi tao mang A
.text
        lw $s3,n
                                 #gan gia tri n vao thanh ghi $s3
        la $s2, A
                                 #gan mang A vao thanh ghi $s2
        lw $s4, step
                                 #gan gia tri step vao thanh ghi $s4
                $s5,$zero,0
                                 #sum=0
        addi
        addi
                $s1,$zero,0
                                 \#i = 0
        slt
                $t2,$s1,$s3
100p:
                $t2,$zero,endloop
        beq
                                 #$t1=2*$s1
        add
                $t1,$s1,$s1
        add
                $t1,$t1,$t1
                                 #$t1=4*$s1
        add
                $t1,$t1,$s2
                                 #$t1 store the address of A[i]
        lw
                $t0,0($t1)
                                 #load value of A[i] in $t0
        add
                $s5,$s5,$t0
                                 #sum=sum+A[i]
        add
                $s1,$s1,$s4
                                 #i=i+step
                                 #goto loop
        Ť
                loop
endloop:
```



Registers	Coproc 1	Coproc 0		
Na	ame	N	umber	Value
\$zero			0	0
\$at			1	268500992
\$v0			2	0
\$vl			3	0
\$a0			4	0
\$al			5	0
\$a2			6	0
\$a3			7	0
\$t0			8	6
\$tl			9	268501020
\$t2			10	0
\$t3			11	0
\$t4			12	0
\$t5			13	0
\$t6			14	0
\$t7			15	0
\$80			16	0
\$sl			17	6
\$s2			18	268501000
\$83			19	6
\$84			20	1
\$85			21	21
\$86			22	0
\$87			23	0
\$t8			24	0
\$t9			25	0
\$k0			26	0
\$kl			27	0
\$gp			28	268468224
\$sp			29	2147479548
\$fp			30	0
\$ra			31	0
pc				4194372
hi				0
10				0

b. i<=n

```
#Laboratory Exercise 3, Assignment 5,i<=n
.data
n:
        .word 6
                                         #khoi tao gia tri n=6
step:
        .word 1
                                         #khoi tao gia tri step =1
        .word 0,2,3,4,5,6
                                         #khoi tao mang A
A:
.text
        lw $s3,n
                                         #gan gia tri n vao thanh ghi $s3
        la $s2, A
                                         #gan mang A vao thanh ghi $s2
        lw $s4, step
                                         #gan gia tri step vao thanh ghi $s4
        addi
                $s5,$zero,0
                                         #sum=0
        addi
                $s1,$zero,0
                                         \#i = 0
        slt
                $t2,$s3,$s1
                                         #n<i thi $t2=1
100p:
        bne
                $t2,$zero,endloop
                                         #$t1=2*$s1
        add
                $t1,$s1,$s1
        add
                $t1,$t1,$t1
                                         #$t1=4*$s1
        add
                $t1,$t1,$s2
                                         #$t1 store the address of A[i]
                                         #load value of A[i] in $t0
        lw
                $t0,0($t1)
        add
                $s5,$s5,$t0
                                         #sum=sum+A[i]
        add
                $s1,$s1,$s4
                                         #i=i+step
                loop
                                         #goto loop
endloop:
```



Registers Coproc 1	Coproc 0	
Name	Number	Value
\$zero	0	0
\$at	1	268500992
\$v0	2	0
\$v1	3	0
\$a0	4	0
\$al	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	268501024
\$t2	10	1
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$80	16	0
\$sl	17	7
\$82	18	268501000
\$83	19	6
\$84	20	1
\$ s 5	21	20
\$86	22	0
\$87	23	0
\$t8	24	0
\$t9	25	0
\$k0	26	0
\$kl	27	0
\$gp	28	268468224
\$sp	29	2147479548
\$fp	30	0
\$ra	31	0
pc		4194372
hi		0
10		0

c. i+j<=0

```
#Laboratory Exercise 3, Assigment 2, sum>=0
.data
                                #khoi tao qia tri n=6
n:
       .word 6
                                #khoi tao gia tri step =1
step:
       .word 1
A:
       .word -1, -4, 3, 4, 5, 6
                                #khoi tao mang A
.text
        lw $s3, n
                                #gan gia tri n vao thanh ghi $s3
                                #gan mang A vao thanh ghi $s2
        la $s2, A
        lw $s4, step
                                #gan gia tri step vao thanh ghi $s4
        addi
               $s5,$zero,0
                                #sum=0
               $s1,$zero,0
                                \#i = 0
        addi
100p:
        slt
               $t2,$s1,$s3
        beq
               $t2,$zero,endloop
        add
               $t1,$s1,$s1
                                #$t1=2*$s1
        add
               $t1,$t1,$t1
                                #$t1=4*$s1
        add
               $t1,$t1,$s2
                                #$t1 store the address of A[i]
                                #load value of A[i] in $t0
        lw
               $t0,0($t1)
        add
               $s5,$s5,$t0
                                #sum=sum+A[i]
                                #sum<0 thi $t7=1
        slt
               $t7,$s5,$0
        beq
               $t7,$zero,endloop
        add
                $s1,$s1,$s4
                                #i=i+step
        j
                loop
                                #goto loop
endloop:
```

	t Segment								o* [2]	Tabels	
kpt	Address	Code	Basic				Source			Label	Address ▲
			01 lui \$1,4097	7:	lw \$83,	n	#gan gia tri n vao thanh	h ghi \$s3	A	ass5 c.asm	
			00 lw \$19,0(\$1)							loop	41943
			01 lui \$1,4097	8:	la \$s2,	A	#gan mang A vao thanh gl	hi \$82		endloop	41943
			08 ori \$18,\$1,8							n	2685009
Ш			01 lui \$1,4097	9:	lw \$84,	step	#gan gia tri step vao th	hanh ghi \$s4		step	2685009
			04 lw \$20,4(\$1)							A	2685010
Н			00 addi \$21,\$0,0	10:	addi	\$85,\$zero,0	#sum=0				
\Box			00 addi \$17,\$0,0	11:	addi	\$sl,\$zero,0	#i=0				
Н			2a slt \$10,\$17,\$19	12: loop:	slt	\$t2,\$s1,\$s3					
Н			09 beg \$10,\$0,9	13:	beq	\$t2,\$zero,endle					
Н			20 add \$9,\$17,\$17	14:	add	\$t1,\$s1,\$s1	#\$t1=2*\$s1				
Н			20 add \$9,\$9,\$9	15:	add	\$t1,\$t1,\$t1	#\$t1=4*\$s1				
Н			20 add \$9,\$9,\$18		add	\$t1,\$t1,\$s2	#\$tl store the address (
Н			00 lw \$8,0(\$9)	17:	1w	\$t0,0(\$t1)	#load value of A[i] in	\$t0			
Н			20 add \$21,\$21,\$8		add	\$85,\$85,\$t0	#sum=sum+A[i]				
Н			2a slt \$15,\$21,\$0	19:	slt	\$t7,\$s5,\$0	∮sum<0 thi \$t7=1				
Н			02 beg \$15,\$0,2	20:	beq	\$t7,\$zero,endle					
Н			20 add \$17,\$17,\$20 08 i 4194336	21:	add	\$s1,\$s1,\$s4	#i=i+step #goto loop				
	1251010			,==-							
	1151070			,,,,,,					 	☑ Data	✓ Text
Dat	a Segment								V	☑ Data	☑ Text
Dat	a Segment Address		Value (+0)	Value (+4)		Value (+8)	Value (+12)	Value (+16)	▼ ▶ Value (+20)	Value (+24)	Value (+28)
Dat	a Segment Address 26850	10992	Value (+0) 6		1	Value (+8)	L -4	3		Value (+24) 4 5	Value (+28)
Dat	a Segment Address 26850 26850	00992 01024	Value (+0) 6 0		1 0	Value (+8)	L -4	3 0		Value (+24) 4 5 0 0	Value (+28)
Dat	a Segment Address 26850 26850 26850	00992 01024 01056	Value (+0) 6 0 0		1 0 0	Value (+8)	L -4 0 0	3 0		Value (+24) 4 5 0 0 0 0 0 0	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850	00992 01024 01056 01088	Value (+0) 6 0 0 0 0		1 0 0	Value (+8) 	L -4 0 0 0 0	3 0 0		Value (+24) 4 5 0 0 0 0 0 0 0	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850 26850	00992 01024 01056 01088	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0	Value (+8)	1 -4 0 0 0 0 0 0 0 0	3 0 0 0		Value (+24) 4	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850 26850 26850	00992 01024 01056 01088 010120 011120	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0	Value (+8) -	-4 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0		Value (+24) 4	Value (+28)
Dat	Address 26850 26850 26850 26850 26850 26850 26850 26850	00992 01024 11056 01088 11120 01152 11184	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0	Value (+8)	-4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0		Value (+24) 4	Value (+28)
Dat	Address 26850 26850 26850 26850 26850 26850 26850 26850	00992 01024 01026 01088 01120 01182 01184 01216	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0	Value (+8)	-4 -4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0		Value (+24) 4	Value (+28)
Dat	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850	00992 01024 01056 011088 01120 01152 11184 011216	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0	Value (+8)	-4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0 0		Value (+24) 4 5 0	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	10992 11024 11056 11088 11120 11152 11184 11216 11248 11280	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0 0	Value (+8)	-4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0 0 0		Value (+24) 4	Value (+28)
Dat	a Segment Address 28850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	00992 11024 11056 11088 11120 11152 11124 11216 11248 11228 11230	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0 0 0 0	Value (+8)	-4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0 0 0		Value (+24) 4	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	00992 010024 010056 010088 011120 011152 011216 012216 012216 012216 013122 013122	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0 0 0 0	Value (+8)	-4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0 0 0 0 0		Value (+24) 4	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	100992 11024 11056 11088 11120 11152 11152 11216 11248 11280 11312 11344 11376	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0 0 0 0 0	Value (+8)	-4 -4 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0	3 0 0 0 0 0 0 0 0 0		Value (+24) 4	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	00992 11024 11056 11088 11120 11152 11184 11216 11228 11334 11342 11376 11408	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+8)	-4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0 0 0 0 0 0 0 0		Value (+24) 4	Value (+28)
Dat	a Segment Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	10992 11024 11056 11068 11152 11152 11184 11216 11248 11280 11312 11314 11314 11316 114108	Value (+0) 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1 0 0 0 0 0 0 0 0 0	Value (+8)	-4 -4 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0	3 0 0 0 0 0 0 0 0 0		Value (+24) 4	Value (+28)

Registers	Coproc 1	Coproc 0		
Name		N	umber	Value
\$zero			0	0
\$at			1	268500992
\$v0			2	0
\$vl			3	0
\$a0			4	0
\$al			5	0
\$a2			6	0
\$a3			7	0
\$t0			8	4
\$t1			9	268501012
\$t2			10	1
\$t3			11	0
\$t4			12	0
\$t5			13	0
\$t6			14	0
\$t7			15	0
\$80			16	0
\$s1			17	3
\$82			18	268501000
\$83			19	6
\$84			20	1
\$85			21	2
\$86			22	0
\$87			23	0
\$t8			24	0
\$t9			25	0
\$k0			26	0
\$kl			27	0
\$gp			28	268468224
\$sp			29	2147479548
\$fp			30	0
\$ra			31	0
pc				4194380
hi				0
10				0

d. i+j>m+n

```
#Laboratory Exercise 3, Assigment 2,A[i]==0
.data
                                        #khoi tao gia tri n=6
n:
       .word 6
step:
       .word 1
                                        #khoi tao gia tri step =1
       .word 1,2,3,0,5,6
                                        #khoi tao mang A
A:
.text
       lw $s3,n
                                        #gan gia tri n vao thanh ghi $s3
       la $s2, A
                                        #gan mang A vao thanh ghi $s2
                                        #gan gia tri step vao thanh ghi $s4
        lw $s4, step
        addi
               $s5,$zero,0
                                        #sum=0
                                        #i=0
        addi
               $s1,$zero,0
100p:
       slt
               $t2,$s1,$s3
                                        #i<n thi $t2=1
       beq
               $t2,$zero,endloop
                                        #$t1=2*$s1
        add
               $t1,$s1,$s1
        add
               $t1,$t1,$t1
                                        #$t1=4*$s1
        add
               $t1,$t1,$s2
                                        #$t1 store the address of A[i]
        lw
               $t0,0($t1)
                                        #load value of A[i] in $t0
                                       #A[i] == 0 thi endloop
       beq
               $t0,$0,endloop
        add
               $s5,$s5,$t0
                                       #sum=sum+A[i]
        add
                $s1,$s1,$s4
                                        #i=i+step
                loop
                                        #goto loop
endloop:
```

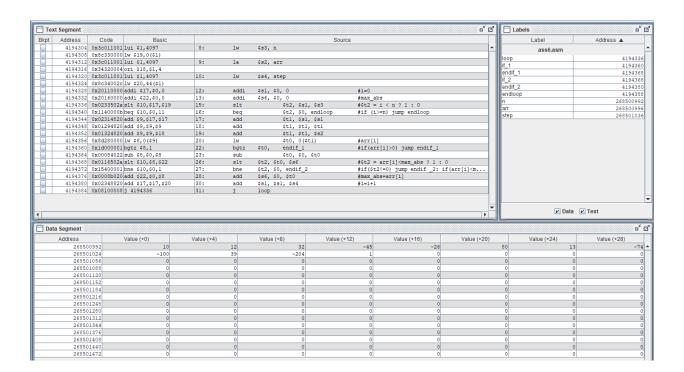
4194312 0x82011001 115 2,4097 S: la 5a2, A	Text	t Segment								ਾਂ⊠ੋ	Labels	
## # # # # # # # # # # # # # # # # # #	ot	Address	Code	Basic				Source			Label	Address ▲
4194131					7:	lw \$s3,	, n	#gan gia tri :	n vao thanh ghi \$s3	_	ass5 d.as	sm
419410 0x8201101 11 21,0197 81 14 542, A \$gan mang A vao taann gm 522 419410 0x420000001 21,01,019 91 14 544, \$tep \$gan gia tri step vao thanh ghi 53d 419410 0x420010101 21,0197 91 14 544, \$tep \$gan gia tri step vao thanh ghi 53d 419410 0x420010101 21,0197 91 14 14 14 14 14 14 14	_										loop	4194
4194320 0x2001001 x1, 4097 9: 1	ш				8:	la \$s2,	, A	#gan mang A v	ao thanh ghi \$s2			4194
4194324 0xec340004 x 220,4(c1)	-										n	268500
4194328 0x201500000 dats 221,50,0	+				9:	IW \$84,	, step	#gan gia tri :	step vao thanh ghi \$84		step	268500
4194332 0x201100000 add 21,70,0	+				10.		4-5 4 0	4 A			A	268501
4194356 0x0233502a sit c10,017,019 121 logy: sit c22,001,003 81 ct. c20,001 c03 81 ct. c10,017,019 4194340 0x02314820 add c90,017,017 141 cd. c40 4194344 0x02314820 add c90,017,017 141 cd. c40 4194344 0x02314820 add c90,017,017 141 cd. c40 4194352 0x0124820 add c90,07,018 161 cd. c40 4194352 0x0124820 add c17,017,020 201 cd. c40,018 161 cd. c40 4194352 0x0124820 add c17,017,020 201 cd. c40 631,031,034 611-4xep 4194352 0x0124820 add c17,017,020 201 cd. c40 0x124820 add c17,017,020 0x124820	+											
4194340 0x11400000beq 210,00,8 13: beq 522,52F0,end10op 4194340 0x02134201add 59,217,217 14: add 511,511,511 4521-4/581 4194340 0x01234201add 59,529,59 15: add 511,511,511 4521-4/581 4194350 0x01234201add 59,59,59 15: add 511,511,511 4521-4/581 4194350 0x01234201add 59,59,59 15: add 511,511,522 4521 store the address of A[1] 4194350 0x10340201add 59,59,518 16: beq 500,0(ct1) 410ad value of A[1] in 500 4194350 0x10340201add 52,529,519 16: add 511,511,523 4194350 0x10340201add 52,529,529 16: add 525,529,500 500000000000000000000000000000000	+								1			
4194344 0x03314820 add 59,51,527 14: add 61,51,51,51 451144521 4194352 0x01324820 add 59,59,520 15: add 61,51,51,51 451144521 4194352 0x01324820 add 59,59,510 16: add 61,51,51,52 4521 store the address of A[3] 4194352 0x01324820 add 59,59,510 17: lw 610,0511 4194360 0x1100003 beq 58,003 18: beq 610,000 add 610,000 48A[3]=0 this endloop 4194360 0x1100003 beq 58,003 18: beq 610,000 add 610,000 48A[3]=0 this endloop 4194360 0x02a88200 add 617,217,220 20: add 621,521,544 4194360 0x02a88200 add 617,217,220 20: add 621,521,544 4194372 0x08100008] 4194386 21: j loop 4goto loop	+							#I <n \$uz="</td" uni=""><td>1</td><td></td><td></td><td></td></n>	1			
419438 0x01294820 add 59,9,9 51 51 add	+							40+1=200m1				
4194352 0x01324820 add 49,89,418 16: add 51,51,622 4510 410430 42,042) 17: law 540,0421 410430 42,042) 419430 0x1000003 beq 58,60,3 18: beq 540,50,endloop 43,13=0 thi endloop 419430 419430 0x02642010 add 21,721,82 19: add 645,635,400 419430 419430 0x02642010 add 21,721,82 19: add 645,635,400 419430 419430 0x02642010 add 21,721,82 21: 3 loop 4300000 4194330	+											
4194356	+								a addrage of A[i]			
4194360	+											
4194364 0x02a8820 add c21, c21, c2 20:	+											
419436 0x02348820 add £17,£17,£20 20: add £31,£31,£34 \$1=1+87EP	+								chazoop			
Address Value (+0) Value (+4) Value (+8) Value (+12) Value (+16) Value (+20) Value (+24) Value (+28) Value (+28) Value (+28) Value (+24) Value (+28) Value (+											
Data Segment Address Value (+0) Value (+4) Value (+8) Value (+12) Value (+16) Value (+20) Value (+24) Value (+28) 2 6 5 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-											
Address Value (+0) Value (+4) Value (+8) Value (+12) Value (+16) Value (+20) Value (+24) Value (+28) 2 e85 0 0 92 6 1 1 1 2 3 3 0 5 5 2 e85 0 1024 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1026 0 0 0 0 0 0 0 0 0 0 2 e85 0 1026 0 0 0 0 0 0 0 0 0 0 2 e85 0 1026 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 e85 0 1120 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0							2009	#g000 100p				
Address Value (+0) Value (+4) Value (+8) Value (+12) Value (+16) Value (+20) Value (+24) Value (+28) 2 65500952 6 1 1 2 3 0 5 5 2 65501024 0 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>2009</th> <th>+y000 100p</th> <th></th> <th>_</th> <th>Į.</th> <th>Data ☑ Text</th>							2009	+y000 100p		_	Į.	Data ☑ Text
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268501024 0 0 0 0 0 0 268501056 0 0 0 0 0 0 0 268501088 0 0 0 0 0 0 0 268501120 0 0 0 0 0 0 0 268501152 0 0 0 0 0 0 0 268501184 0 0 0 0 0 0 0 268501216 0 0 0 0 0 0 0 268501226 0 0 0 0 0 0 0 268501230 0 0 0 0 0 0 0 268501312 0 0 0 0 0 0 0 268501324 0 0 0 0 0 0 0 268501324 0 0 0 0 0 0 0 268501326 0 0 0 0 0 0 0 268501326 0 0 0 0 0 0 0 268501327 0 0 <td>Data</td> <td></td> <td></td> <td>Value (+ft)</td> <td>Value (+d)</td> <td></td> <td></td> <td></td> <td>Value (±15)</td> <td></td> <td>IL</td> <td></td>	Data			Value (+ft)	Value (+d)				Value (±15)		IL	
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268501088 0 0 0 0 0 0 268501120 0 0 0 0 0 0 0 268501152 0 0 0 0 0 0 0 268501164 0 0 0 0 0 0 0 268501216 0 0 0 0 0 0 0 268501246 0 0 0 0 0 0 0 268501220 0 0 0 0 0 0 0 268501312 0 0 0 0 0 0 0 268501344 0 0 0 0 0 0 0 268501376 0 0 0 0 0 0 0)ata	Address 26850	00992	6	Value (+4)	1	Value (+8) 1	Value (+12) 2	3		Value (+24)	Value (+28)
268501120 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Data	Address 26850 26850	00992 01024	6	Value (+4)	1 0	Value (+8) 1 0	Value (+12) 2 0	3		Value (+24)	Value (+28)
268501152 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Oata	Address 26850 26850 26850	00992 01024 01056	6 0 0	Value (+4)	1 0 0 0	Value (+8) 1 0 0	Value (+12) 2 0 0	3 0 0		Value (+24) 0 0 0	Value (+28) 5 0 0
268501124 0)ata	Address 26850 26850 26850 26850	00992 01024 01056 01088	6 0 0	Value (+4)		Value (+8) 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+12) 2 0 0 0	3 0 0		Value (+24) 0 0 0 0 0	Value (+28) 5 0 0 0
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269501440 0 0 0 0 0	Data	Address 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850 26850	00992 01024 01056 01068 01120 01152 01184 01216 01248 01280 011312 01344 01376	6 0 0 0 0 0 0 0 0 0 0	Value (+4)	0 0 0 0 0 0	Value (+8) 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+12) 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0 0 0 0 0 0		Value (+24) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Value (+28) 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Registers Coproc 1	Coproc 0	
Name	Number	Value
\$zero	0	0
\$at	1	268500992
\$v0	2	0
\$v1	3	0
\$a0	4	0
\$al	5	
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	268501012
\$t2	10	1
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$80	16	0
\$sl	17	3
\$82	18	268501000
\$33	19	6
\$84	20	1
\$85	21	6
\$86	22	0
\$87	23	0
\$t8	24	0
\$t9	25	0
\$k0	26	0
\$kl	27	0
\$gp	28	268468224
\$sp	29	2147479548
\$fp	30	0
\$ra	31	0
рс		4194376
hi		0
10		0

Bài 6:

Code

```
#Laboratory Exercise 3, Assgiment 6
.data
n:
                .word
                .word
                        12,32,-45,-26,80,13,-74,-100,39,-204
arr:
                .word 1
step:
.text
        #load
        lw
                $s3, n
                $s2, arr
        1a
        lw
                $s4, step
        #work
                $s1, $0, 0
                                                 \#i = 0
        addi
        addi
                $s6, $0, 0
                                                 #max_abs
100p:
        slt
                        $t2, $s1, $s3
                                                 #$t2 = i < n ? 1 : 0
                        $t2, $0, endloop
        bea
                                                 \#if (i>=n) jump endloop
        add
                        $t1, $s1, $s1
        add
                        $t1, $t1, $t1
                        $t1, $t1, $s2
        add
                        $t0, 0($t1)
                                                 #arr[i]
        lw
if_1:
                $t0,
                        endif 1
                                                 #if(arr[i]>0) jump endif 1
        bgtz
        sub
                        $t0, $0, $t0
endif_1:
if 2:
        slt
                $t2, $t0, $s6
                                                 #$t2 = arr[i] < max abs ? 1 : 0
                $t2, $0, endif_2
                                                 #if($t2!=0) jump endif _2: if(arr[i]<max_abs) jump endif_2</pre>
        bne
                $s6, $0, $t0
                                                 #max_abs=arr[i]
        add
endif_2:
        add
                $s1, $s1, $s4
                                                #i=i+1
                loop
endloop:
```



Registers	Coproc 1	Coproc 0		
Name		Number		Value
\$zero			0	0
\$at			1	268500992
\$v0			2	0
\$vl			3	0
\$a0			4	0
\$al			5	0
\$a2			6	0
\$a3			7	0
\$t0			8	204
\$t1			9	268501032
\$t2			10	0
\$t3			11	0
\$t4			12	0
\$t5			13	0
\$t6			14	0
\$t7			15	0
\$80			16	0
\$sl			17	10
\$s2			18	268500996
\$83			19	10
\$84			20	1
\$85			21	0
\$86			22	204
\$87			23	0
\$t8			24	0
\$t9			25	0
\$k0			26	0
\$kl			27	0
\$gp			28	268468224
\$sp			29	2147479548
\$fp			30	0
\$ra			31	0
pc				4194388
hi				0
10				0