

Bài 1:

Edit		Execute	
<input type="checkbox"/> Text Segment			
Bkpt	Address	Code	Basic
	0x00400000	0x20103007	addi \$t6,\$0,0x00003007
	0x00400004	0x00008020	add \$t6,\$0,\$0
			Source
			addi \$t0,\$zero,0x3007
			add \$t0,\$zero,\$0

Data Segment	
Address	Value (+0)
0x10010000	0x00000000
0x10010020	0x00000000
0x10010040	0x00000000
0x10010060	0x00000000
0x10010080	0x00000000
0x100100A8	0x00000000
0x100100C0	0x00000000
0x100100E8	0x00000000
0x10010100	0x00000000
0x10010120	0x00000000
0x10010140	0x00000000
0x10010160	0x00000000
0x10010180	0x00000000
0x100101A8	0x00000000
0x100101C0	0x00000000

Registers Coproc 1 Coproc 0	
Name	Number
\$zero	0
\$at	1
\$v0	2
\$v1	3
\$a0	4
\$a1	5
\$a2	6
\$a3	7
\$t0	8
\$t1	9
\$t2	10
\$t3	11
\$t4	12
\$t5	13
\$t6	14
\$t7	15
\$s0	16
\$s1	17
\$s2	18
\$s3	19
\$s4	20
\$s5	21
\$s6	22
\$s7	23
\$s8	24
\$t9	25
\$k0	26
\$k1	27
\$gp	28
\$fp	29
\$ra	30
\$sp	31
\$PC	
\$hi	
\$lo	

Labels	
Name	Value
\$zero	0x00000000
\$at	0x00000000
\$v0	0x00000000
\$v1	0x00000000
\$a0	0x00000000
\$a1	0x00000000
\$a2	0x00000000
\$a3	0x00000000
\$t0	0x00000000
\$t1	0x00000000
\$t2	0x00000000
\$t3	0x00000000
\$t4	0x00000000
\$t5	0x00000000
\$t6	0x00000000
\$t7	0x00000000
\$s0	0x00000000
\$s1	0x00000000
\$s2	0x00000000
\$s3	0x00000000
\$s4	0x00000000
\$s5	0x00000000
\$s6	0x00000000
\$s7	0x00000000
\$t9	0x7fffffc0
\$PC	0x00000000
\$hi	0x00000000
\$lo	0x00000000

☒ Data
 ☒ Text

*Chạy từng dòng lệnh:

[illegible][illegible]

*Sự thay đổi giá trị của thanh ghi:

Sự thay đổi giá trị của thanh ghi \$s0 khi chạy từng lệnh :

0x00000000 → 0x00003007 → 0x00000000

Sự thay đổi giá trị của thanh ghi \$pc khi chạy từng lệnh:

0x00400000 → 0x00400004 → 0x00400008

*So sánh mã máy của các lệnh:

addi \$s0, \$zero, 0x3007

op: 8

rs: \$zero

rt: \$s0

imm: 0x3007

0010 0000 0001 0000 0011 0000 0000 0111 => 0x20103007

add \$s0, \$zero, \$0

op:0

rd: \$s0

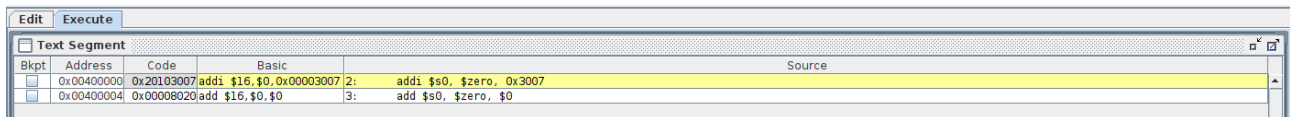
rs: \$zero

rt: \$0

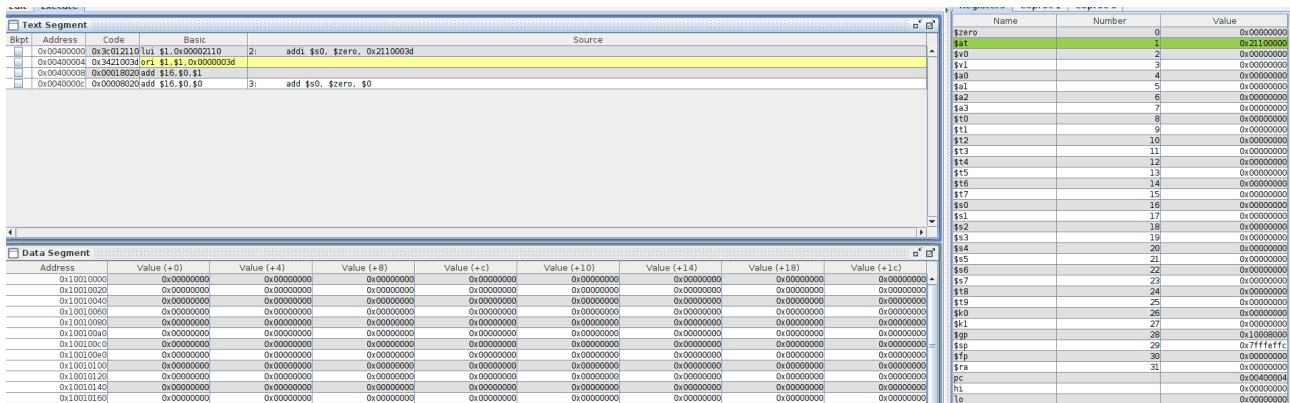
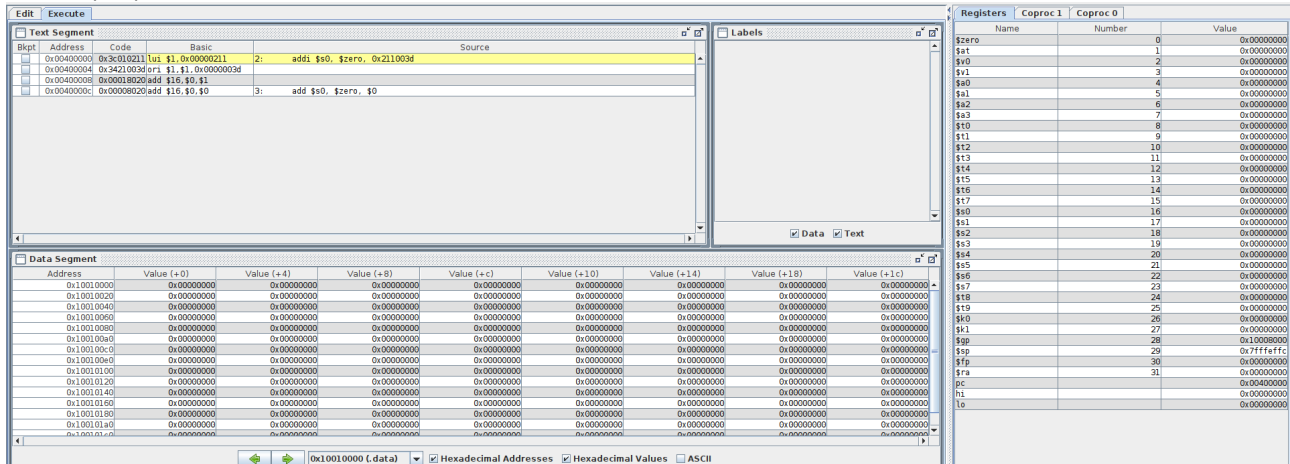
shamt: 0

funct:32

0000 0000 0000 0000 1000 0000 0010 0000 => 0x00008020



*Sửa lại lệnh:



Edit Execute					Registers Coproc 1 Coproc 0			
Text Segment					Name	Number	0	Value
Bkpt	Address	Code	Basic	Source	\$zero		0	0x00000000
<input type="checkbox"/>	0x00400000	0x3c012110	lui \$1, 0x00002110	2: addi \$s0, \$zero, 0x2110003d	\$s0		1	0x2110003d
<input type="checkbox"/>	0x00400004	0x3421003d	ori \$1, \$1, 0x0000003d		\$v0		2	0x00000000
<input type="checkbox"/>	0x00400008	0x00018020	add \$16, \$0, \$1		\$v1		3	0x00000000
<input type="checkbox"/>	0x0040000c	0x00008020	add \$16, \$0, \$0	3: add \$s0, \$zero, \$0	\$a0		4	0x00000000
					\$a1		5	0x00000000
					\$a2		6	0x00000000
					\$a3		7	0x00000000
					\$t0		8	0x00000000
					\$t1		9	0x00000000
					\$t2		10	0x00000000
					\$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
					\$t8		24	0x00000000
					\$t9		25	0x00000000
					\$k0		26	0x00000000
					\$k1		27	0x00000000
					\$gp		28	0x10000000
					\$fp		29	0x7ffffcfc
					\$fp		30	0x00000000
					\$ra		31	0x00000000
					\$c			0x00400010
					\$h			0x00000000
					\$lo			0x00000000

Edit Execute					Registers Coproc 1 Coproc 0			
Text Segment					Name	Number	0	Value
Bkpt	Address	Code	Basic	Source	\$zero		0	0x00000000
<input type="checkbox"/>	0x00400000	0x3c012110	lui \$1, 0x00002110	2: addi \$s0, \$zero, 0x2110003d	\$at		1	0x2110003d
<input type="checkbox"/>	0x00400004	0x3421003d	ori \$1, \$1, 0x0000003d		\$v0		2	0x00000000
<input type="checkbox"/>	0x00400008	0x00018020	add \$16, \$0, \$1		\$v1		3	0x00000000
<input type="checkbox"/>	0x0040000c	0x00008020	add \$16, \$0, \$0	3: add \$s0, \$zero, \$0	\$a0		4	0x00000000
					\$a1		5	0x00000000
					\$a2		6	0x00000000
					\$a3		7	0x00000000
					\$t0		8	0x00000000
					\$t1		9	0x00000000
					\$t2		10	0x00000000
					\$t3		11	0x00000000
					\$t4		12	0x00000000
					\$t5		13	0x00000000
					\$t6		14	0x00000000
					\$s0		16	0x2110003d
					\$s1		17	0x00000000
					\$s2		18	0x00000000
					\$s3		19	0x00000000
					\$s4		20	0x00000000
					\$s5		21	0x00000000
					\$s6		22	0x00000000
					\$s7		23	0x00000000
					\$t8		24	0x00000000
					\$t9		25	0x00000000
					\$k0		26	0x00000000
					\$k1		27	0x00000000
					\$gp		28	0x10000000
					\$fp		29	0x7ffffcfc
					\$fp		30	0x00000000
					\$ra		31	0x00000000
					\$c			0x00400010
					\$h			0x00000000
					\$lo			0x00000000

Edit Execute					Registers Coproc 1 Coproc 0			
Text Segment					Name	Number	0	Value
Bkpt	Address	Code	Basic	Source	\$zero		0	0x00000000
<input type="checkbox"/>	0x00400000	0x3c012110	lui \$1, 0x00002110	2: addi \$s0, \$zero, 0x2110003d	\$at		1	0x2110003d
<input type="checkbox"/>	0x00400004	0x3421003d	ori \$1, \$1, 0x0000003d		\$v0		2	0x00000000
<input type="checkbox"/>	0x00400008	0x00018020	add \$s0, \$s0, \$1		\$v1		3	0x00000000
<input type="checkbox"/>	0x0040000c	0x00008020	add \$16, \$0, \$0	3: add \$s0, \$zero, \$0	\$a0		4	0x00000000
					\$a1		5	0x00000000
					\$a2		6	0x00000000
					\$a3		7	0x00000000
					\$t0		8	0x00000000
					\$t1		9	0x00000000
					\$t2		10	0x00000000
					\$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
					\$t8		24	0x00000000
					\$t9		25	0x00000000
					\$k0		26	0x00000000
					\$k1		27	0x00000000
					\$gp		28	0x10000000
					\$fp		29	0x7ffffcfc
					\$fp		30	0x00000000
					\$ra		31	0x00000000
					\$c			0x00400010
					\$h			0x00000000
					\$lo			0x00000000

Khi sửa lệnh lui, vì hằng số ở đây là 32 bit nên để thực hiện được lệnh addi thì phải tách thành hai lệnh basic là lui và ori.

Bài 2:

Edit
Execute

ex1
mips1.asm
mips2.asm

```

.text
    lui $s0, 0x2110
    ori $s0, 0x003d
          
```

Registers
Copro1
Copro0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$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
\$t8	24	0x00000000
\$t9	25	0x00000000
\$k0	26	0x00000000
\$k1	27	0x00000000
\$kp	28	0x00000000
\$fp	29	0x7ffffeff
\$tp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400000
hi		0x00000000
lo		0x00000000

[illegible]

*Chạy từng dòng lệnh và quan sát:

[illegible]

Edit
Execute

Bkpt	Address	Code	Basic	Source
	0x00000000	0x1021101	lui \$16, 0x00002110	2: lui \$16, 0x2110
	0x00400004	0x3810003d	ori \$16, \$16, 0x0000003d	3: ori \$16, 0x003d

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010020	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010040	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010060	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010080	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100e0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010100	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010120	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010140	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010160	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010180	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100101a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100101c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

⏮ ⏪ ⏩ ⏭
(0x10010000 [data])
☒ Hexadecimal Addresses
☒ Hexadecimal Values
☐ ASCII

Registers
Copro 1
Copro 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x2110003d
\$s1	17	0x00000000
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s8	24	0x00000000
\$t9	25	0x0000

*Sự thay đổi của các thanh ghi:

\$s0: 0x00000000 → 0x21100000 → 0x2110003d

\$pc: 0x00400000 → 0x00400004 → 0x00400008

*Quan sát cửa sổ Data Segment:

Các byte đầu tiên ở vùng lệnh trùng với cột Code trong cửa sổ Text Segment.

EditExecute

Text Segment

Bkpt	Address	Code	Basic	Source
<input type="checkbox"/>	0x00400000	0x3c102110	lui \$t6, 0x00002110	2: lui \$s0, 0x2110
<input type="checkbox"/>	0x00400004	0x3610003d	ori \$t6, \$t6, 0x0000003d	3: ori \$s0, 0x003d

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x00400000	0x3c102110	0x3610003d	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400020	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400040	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400060	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400080	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x004000a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x004000c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x004000e0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400100	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400120	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400140	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400160	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x00400180	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x004001a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x004001c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

Bài 3:

Edit Execute

ex1 mips1.asm mips2.asm mips3.asm

```

.text
    li $s0, 0x2110003d
    li $s1, 0x2
        
```

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x21100000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x2110003d
\$s1	17	0x00000002
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s8	24	0x00000000
\$t9	25	0x00000000
\$k0	26	0x00000000
\$k1	27	0x00000000
\$gp	28	0x10000000
\$fp	29	0x7ffffeff
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400000
hi		0x00000000
lo		0x00000000

edit

Execute

Text Segment

Beg	Address	Code	Basic	Source
<input type="checkbox"/>	0x00400000	0x0c0210	lui \$1, 0x0000210	2: \$1 \$0, 0x2100003d
<input type="checkbox"/>	0x00400004	0x340003d	ori \$16 \$1, 0x0000003d	
<input type="checkbox"/>	0x00400008	0x2410002	addiu \$17 \$0, 0x0000...	3: \$1 \$1, 0x2

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010020	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010040	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010060	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010080	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100e0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010100	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010120	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010140	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010160	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

Registers

Coproc 1

Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$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
\$s8	24	0x00000000
\$s9	25	0x00000000
\$s0	26	0x00000000
\$s1	27	0x00000000
\$gp	28	0x10000000
\$sp	29	0x7ffff000
\$fp	30	0x00000000
\$ra	31	0x00000000
\$pc		0x00400000
\$hi		0x00000000
\$lo		0x00000000

Bài 4:

[illegible]

[illegible]

*Sự thay đổi của các thanh ghi:

\$t1 : 0x00000000 → 0x00000005

\$t2 : 0x00000000 → 0xffffffff

\$s0 : 0x00000000 → 0x0000000a → 0x00000009

*Kiểm nghiệm với khuôn mẫu của kiểu lệnh I:

addi \$9, \$0, 0x00000005

op: 8

rs:\$0

rt:\$9

imm: 0x00000005

0010 0000 0000 1001 0000 0000 0000 0101 => 0x20090005

addi \$10, \$0, 0xffffffff

op: 8

rs: \$0

rt: \$10

imm: 0xffffffff

0010 0000 0000 1010 1111 1111 1111 1111 => 0x200affff

*Kiểm nghiệm với khuôn mẫu của kiểu lệnh R:

add \$16, \$9, \$9

op:0

rs:\$9

rt:\$9

rd: \$16

sh:0

fn:32

0000 0001 0010 1001 1000 0000 0010 0000 => 0x01298020

add \$16, \$16, \$10

op:0

rs: \$16

rt: \$10

rd: \$16

sh:0

fn:32

0000 0010 0000 1010 1000 0000 0010 0000 => 0x020a8020

Bài 5:

The screenshot shows a MIPS assembler simulator interface. The left pane displays assembly code, and the right pane shows a register window.

Assembly Code:

```
.text
addi $t1, $zero, 4
addi $t2, $zero, 5

mul $s0, $t1, $t2
mul $s0, $s0, 3

mflo $s1
```

Register Window:

Register	Name	Number	Value
\$zero		0	0x00000000
\$t1		1	0x00000004
\$t2		2	0x00000005
\$t3		3	0x00000000
\$t4		4	0x00000000
\$t5		5	0x00000000
\$t6		6	0x00000000
\$t7		7	0x00000000
\$t8		8	0x00000000
\$t9		9	0x00000000
\$t10		10	0x00000000
\$t11		11	0x00000000
\$t12		12	0x00000000
\$t13		13	0x00000000
\$t14		14	0x00000000
\$t15		15	0x00000000
\$t16		16	0x00000000
\$t17		17	0x00000000
\$t18		18	0x00000000
\$t19		19	0x00000000
\$t20		20	0x00000000
\$t21		21	0x00000000
\$t22		22	0x00000000
\$t23		23	0x00000000
\$t24		24	0x00000000
\$t25		25	0x00000000
\$t26		26	0x00000000
\$t27		27	0x00000000
\$t28		28	0x00000000
\$t29		29	0x00000000
\$t30		30	0x00000000
\$t31		31	0x00000000
\$f0			0x00000000
\$f1			0x00000000
\$f2			0x00000000
\$f3			0x00000000
\$f4			0x00000000
\$f5			0x00000000
\$f6			0x00000000
\$f7			0x00000000
\$f8			0x00000000
\$f9			0x00000000
\$f10			0x00000000
\$f11			0x00000000
\$f12			0x00000000
\$f13			0x00000000
\$f14			0x00000000
\$f15			0x00000000
\$f16			0x00000000
\$f17			0x00000000
\$f18			0x00000000
\$f19			0x00000000
\$f20			0x00000000
\$f21			0x00000000
\$f22			0x00000000
\$f23			0x00000000
\$f24			0x00000000
\$f25			0x00000000
\$f26			0x00000000
\$f27			0x00000000
\$f28			0x00000000
\$f29			0x00000000
\$f30			0x00000000
\$f31			0x00000000

[illegible]

*Giải thích điều bất thường:

-lệnh mul đầu tiên thực hiện bình thường do là lệnh mul basic (nhân hai biến)

-lệnh mul thứ 2 không phải là lệnh basic (vì nhân hằng với biến), nên thực hiện biến đổi thành hai lệnh (gán hằng số cho thanh ghi tạm rồi mới thực hiện phép nhân)

* Chạy từng lệnh :

Text Segment				Registers Coproc 1 Coproc 0			
Bkpt	Address	Code	Basic	Source	Name	Number	Value
	0x00400000	0x20000004	addi \$0,\$0,0x00000004	2: addi \$t1,\$zero, 4	\$zero	0	0x00000000
	0x00400004	0x20000005	addi \$10,\$0,0x00000005	3: addi \$t2,\$zero, 5	\$t1	1	0x00000000
	0x00400008	0x72018002	mul \$10,\$0,\$t1	5: mul \$t0,\$t1,\$t2	\$t1	3	0x00000000
	0x0040000C	0x20010001	addi \$1,\$0,0x00000003	6: mul \$t0,\$t0,\$t3	\$t0	4	0x00000000
	0x00400010	0x72018002	mul \$10,\$t0,\$t1	8: rftlo \$s1	\$t2	5	0x00000000
	0x00400014	0x00009891	zeflo \$t1		\$t3	6	0x00000000
					\$t0	8	0x00000000
					\$t1	9	0x00000004
					\$t2	10	0x00000000
					\$t3	11	0x00000000
					\$t4	12	0x00000000
					\$t5	13	0x00000000
					\$t6	14	0x00000000
					\$t7	15	0x00000000
					\$t8	16	0x00000000
					\$t9	17	0x00000000
					\$t10	18	0x00000000
					\$t11	19	0x00000000
					\$t12	20	0x00000000
					\$t13	21	0x00000000
					\$t14	22	0x00000000
					\$t15	23	0x00000000
					\$t16	24	0x00000000
					\$t17	25	0x00000000
					\$t18	26	0x00000000
					\$t19	27	0x00000000
					\$t20	28	0x00000000
					\$t21	29	0x7ffffc00
					\$t22	30	0x00000000
					\$t23	31	0x00000000
					\$t24		0x00000000
					\$t25		0x00000000
					\$t26		0x00000000
					\$t27		0x00000000
					\$t28		0x00000000
					\$t29		0x00000000
					\$t30		0x00000000
					\$t31		0x00000000
					\$t32		0x00000000
					\$t33		0x00000000
					\$t34		0x00000000
					\$t35		0x00000000
					\$t36		0x00000000
					\$t37		0x00000000
					\$t38		0x00000000
					\$t39		0x00000000
					\$t40		0x00000000
					\$t41		0x00000000
					\$t42		0x00000000
					\$t43		0x00000000
					\$t44		0x00000000
					\$t45		0x00000000
					\$t46		0x00000000
					\$t47		0x00000000
					\$t48		0x00000000
					\$t49		0x00000000
					\$t50		0x00000000
					\$t51		0x00000000
					\$t52		0x00000000
					\$t53		0x00000000
					\$t54		0x00000000
					\$t55		0x00000000
					\$t56		0x00000000
					\$t57		0x00000000
					\$t58		0x00000000
					\$t59		0x00000000
					\$t60		0x00000000
					\$t61		0x00000000
					\$t62		0x00000000
					\$t63		0x00000000
					\$t64		0x00000000
					\$t65		0x00000000
					\$t66		0x00000000
					\$t67		0x00000000
					\$t68		0x00000000
					\$t69		0x00000000
					\$t70		0x00000000
					\$t71		0x00000000
					\$t72		0x00000000
					\$t73		0x00000000
					\$t74		0x00000000
					\$t75		0x00000000
					\$t76		0x00000000
					\$t77		0x00000000
					\$t78		0x00000000
					\$t79		0x00000000
					\$t80		0x00000000
					\$t81		0x00000000
					\$t82		0x00000000
					\$t83		0x00000000
					\$t84		0x00000000
					\$t85		0x00000000
					\$t86		0x00000000
					\$t87		0x00000000
					\$t88		0x00000000
					\$t89		0x00000000
					\$t90		0x00000000
					\$t91		0x00000000
					\$t92		0x00000000
					\$t93		0x00000000
					\$t94		0x00000000
					\$t95		0x00000000
					\$t96		0x00000000
					\$t97		0x00000000
					\$t98		0x00000000
					\$t99		0x00000000
					\$t100		0x00000000
					\$t101		0x00000000
					\$t102		0x00000000
					\$t103		0x00000000
					\$t104		0x00000000
					\$t105		0x00000000
					\$t106		0x00000000
					\$t107		0x00000000
					\$t108		0x00000000
					\$t109		0x00000000
					\$t110		0x00000000
					\$t111		0x00000000
					\$t112		0x00000000
					\$t113		0x00000000
					\$t114		0x00000000
					\$t115		0x00000000
					\$t116		0x00000000
					\$t117		0x00000000
					\$t118		0x00000000
					\$t119		0x00000000
					\$t120		0x00000000
					\$t121		0x00000000
					\$t122		0x00000000
					\$t123		0x00000000
					\$t124		0x00000000
					\$t125		0x00000000
					\$t126		0x00000000
					\$t127		0x00000000
					\$t128		0x00000000
					\$t129		0x00000000
					\$t130		0x00000000
					\$t131		0x00000000
					\$t132		0x00000000
					\$t133		0x00000000
					\$t134		0x00000000
					\$t135		0x00000000
					\$t136		0x00000000
					\$t137		0x00000000
					\$t138		0x00000000
					\$t139		0x00000000
					\$t140		0x00000000
					\$t141		0x00000000
					\$t142		0x00000000
					\$t143		0x00000000
					\$t144		0x00000000
					\$t145		0x00000000
					\$t146		0x00000000
					\$t147		0x00000000
					\$t148		0x00000000
					\$t149		0x00000000
					\$t150		0x00000000
					\$t151		0x00000000
					\$t152		0x00000000
					\$t153		0x00000000
					\$t154		0x00000000
					\$t155		0x00000000
					\$t156		0x00000000
					\$t157		0x00000000
					\$t158		0x00000000
					\$t159		0x00000000
					\$t160		0x00000000
					\$t161		0x00000000
					\$t162		0x00000000
					\$t163		0x00000000
					\$t164		0x00000000
					\$t165		0x00000000
					\$t166		0x00000000
					\$t167		0x00000000
					\$t168		0x00000000
					\$t169		0x00000000
					\$t170		0x00000000
					\$t171		0x00000000
					\$t172		0x00000000
					\$t173		0x00000000
					\$t174		0x00000000
					\$t175		0x00000000
					\$t176		0x00000000
					\$t177		0x00000000
					\$t178		0x00000000
					\$t179		0x00000000
					\$t180		0x00000000
					\$t181		0x00000000
					\$t182		0x00000000
					\$t183		0x00000000
					\$t184		0x00000000
					\$t185		0x00000000
					\$t186		0x00000000
					\$t187		0x00000000
					\$t188		0x00000000
					\$t189		0x00000000
					\$t190		0x00000000
					\$t191		0x00000000
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					\$t194		0x00000000
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					\$t196		0x00000000
					\$t197		0x00000000
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					\$t199		0x00000000
					\$t200		0x00000000
					\$t201		0x00000000
					\$t202		0x00000000
					\$t203		0x00000000
					\$t204		0x00000000
					\$t205		0x00000000
					\$t206		0x00000000
					\$t207		0x00000000
					\$t208		0x00000000
					\$t209		0x00000000
					\$t210		0x00000000
					\$t211		0x00000000
					\$t212		0x00000000
					\$t213		0x00000000
					\$t214		0x00000000
					\$t215		0x00000000
					\$t216		0x0000000

edit

Executes

Text Segment

Blk#	Address	Code	Basic	Source
0	0x0400000	0x20090004	addi \$9,\$0,0x00000004	2: addi \$t1,\$zero, 4
1	0x0400004	0x200a0005	addi \$10,\$0,0x00000005	3: addi \$t2,\$zero, 5
2	0x0400008	0x712a8002	mul \$16,\$0,\$10	5: mul \$s0,\$t1,\$t2
3	0x040000c	0x20010003	addi \$1,\$0,0x00000003	6: mul \$s0,\$s0,\$3
4	0x0400010	0x72018002	mul \$16,\$16,\$1	
5	0x0400014	0x00006001	zeflo \$17	8: zeflo \$s1

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010020	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010040	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010060	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010080	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100e0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010100	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010120	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010140	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010160	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010180	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100101a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

Registers

Coproc 1

Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$t1	1	0x00000000
\$t2	2	0x00000000
\$t3	3	0x00000000
\$t0	4	0x00000000
\$t1	5	0x00000000
\$t2	6	0x00000000
\$t3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000004
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$t8	16	0x00000000
\$t1	17	0x00000000
\$t2	18	0x00000000
\$t3	19	0x00000000
\$t4	20	0x00000000
\$t5	21	0x00000000
\$t6	22	0x00000000
\$t7	23	0x00000000
\$t8	24	0x00000000
\$t9	25	0x00000000
\$t0	26	0x00000000
\$t1	27	0x00000000
\$t2	28	0x00000000
\$t3	29	0x7fffffc0
\$t4	30	0x00000000
\$t5	31	0x00000000
\$t6	32	0x00000000
\$t7	33	0x00000000
\$t8	34	0x00000000
\$t9	35	0x00000000
\$t0	36	0x00000000

EditExecute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x20900004	addi \$9,\$0,0x00000004	2: addi \$t1,\$zero, 4
	0x00400004	0x20940005	addi \$10,\$0,0x00000005	3: addi \$t2,\$zero, 5
	0x00400008	0x712a8002	mul \$16,\$9,\$10	5: mul \$s0,\$t1,\$t2
	0x0040000c	0x20010003	addi \$1,\$0,0x00000003	6: mul \$s0,\$s0,3
	0x00400010	0x72038002	mul \$16,\$16,\$1	
	0x00400014	0x00008812	mflo \$17	8: mflo \$s1

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010020	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010040	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010060	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010080	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100e0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010100	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010120	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010140	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010160	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010180	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100101a0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100101c0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100101e0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010200	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

Registers

Coproc 1

Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000004
\$t2	10	0x00000005
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$t8	16	0x00000014
\$t9	17	0x00000000
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s9	25	0x00000000
\$t9	26	0x00000000
\$t0	27	0x00000000
\$sp	28	0x10000000
\$fp	29	0x7fffffc0
\$f0	30	0x00000000
\$f1	31	0x00000000
\$f2	32	0x00000000
\$f3	33	0x00000000
\$f4	34	0x00000000
\$f5	35	0x00000000
\$f6	36	0x00000000
\$f7	37	0x00000000
\$f8	38	0x00000000
\$f9	39	0x00000000
\$f10	40	0x00000000
\$f11	41	0x00000000
\$f12	42	0x00000000
\$f13	43	0x00000000
\$f14	44	0x00000000
\$f15	45	0x00000000
\$f16	46	0x00000000
\$f17	47	0x00000000
\$f18	48	0x00000000
\$f19	49	0x00000000
\$f20	50	0x00000000
\$f21	51	0x00000000
\$f22	52	0x00000000
\$f23	53	0x00000000
\$f24	54	0x00000000
\$f25	55	0x00000000
\$f26	56	0x00000000
\$f27	57	0x00000000
\$f28	58	0x00000000
\$f29	59	0x00000000
\$f30	60	0x00000000
\$f31	61	0x00000000
\$f32	62	0x00000000
\$f33	63	0x00000000
\$f34	64	0x00000000
\$f35	65	0x00000000
\$f36	66	0x00000000
\$f37	67	0x00000000
\$f38	68	0x00000000
\$f39	69	0x00000000
\$f40	70	0x00000000
\$f41	71	0x00000000
\$f42	72	0x00000000
\$f43	73	0x00000000
\$f44	74	0x00000000
\$f45	75	0x00000000
\$f46	76	0x00000000
\$f47	77	0x00000000
\$f48	78	0x00000000
\$f49	79	0x00000000
\$f50	80	0x00000000
\$f51	81	0x00000000
\$f52	82	0x00000000
\$f53	83	0x00000000
\$f54	84	0x00000000
\$f55	85	0x00000000
\$f56	86	0x00000000
\$f57	87	0x00000000
\$f58	88	0x00000000
\$f59	89	0x00000000
\$f60	90	0x00000000
\$f61	91	0x00000000
\$f62	92	0x00000000
\$f63	93	0x00000000
\$f64	94	0x00000000
\$f65	95	0x00000000
\$f66	96	0x00000000
\$f67	97	0x00000000
\$f68	98	0x00000000
\$f69	99	0x00000000
\$f70	100	0x00000000
\$f71	101	0x00000000
\$f72	102	0x00000000
\$f73	103	0x00000000
\$f74	104	0x00000000
\$f75	105	0x00000000
\$f76	106	0x00000000
\$f77	107	0x00000000
\$f78	108	0x00000000
\$f79	109	0x00000000
\$f80	110	0x00000000
\$f81	111	0x00000000
\$f82	112	0x00000000
\$f83	113	0x00000000
\$f84	114	0x00000000
\$f85	115	0x00000000
\$f86	116	0x00000000
\$f87	117	0x00000000
\$f88	118	0x00000000
\$f89	119	0x00000000
\$f90	120	0x00000000
\$f91	121	0x00000000
\$f92	122	0x00000000
\$f93	123	0x00000000
\$f94	124	0x00000000
\$f95	125	0x00000000
\$f96	126	0x00000000
\$f97	127	0x00000000
\$f98	128	0x00000000
\$f99	129	0x00000000
\$f100	130	0x00000000
\$f101	131	0x00000000
\$f102	132	0x00000000
\$f103	133	0x00000000
\$f104	134	0x00000000
\$f105	135	0x00000000
\$f106	136	0x00000000
\$f107	137	0x00000000
\$f108	138	0x00000000
\$f109	139	0x00000000
\$f110	140	0x00000000
\$f111	141	0x00000000
\$f112	142	0x00000000
\$f113	143	0x00000000
\$f114	144	0x00000000
\$f115	145	0x00000000
\$f116	146	0x00000000
\$f117	147	0x00000000
\$f118	148	0x00000000
\$f119	149	0x00000000
\$f120	150	0x00000000
\$f121	151	0x00000000
\$f122	152	0x00000000
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\$f124	154	0x00000000
\$f125	155	0x00000000
\$f126	156	0x00000000
\$f127	157	0x00000000
\$f128	158	0x00000000
\$f129	159	0x00000000
\$f130	160	0x00000000
\$f131	161	0x00000000
\$f132	162	0x00000000
\$f133	163	0x00000000
\$f134	164	0x00000000
\$f135	165	0x00000000
\$f136	166	0x00000000
\$f137	167	0x00000000
\$f138	168	0x00000000
\$f139	169	0x00000000
\$f140	170	0x00000000
\$f141	171	0x00000000
\$f142	172	0x00000000
\$f143	173	0x00000000
\$f144	174	0x00000000
\$f145	175	0x00000000
\$f146	176	0x00000000
\$f147	177	0x00000000
\$f148	178	0x00000000
\$f149	179	0x00000000
\$f150	180	0x00000000
\$f151	181	0x00000000
\$f152	182	0x00000000
\$f153	183	0x00000000
\$f154	184	0x00000000
\$f155	185	0x00000000
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\$f157	187	0x00000000
\$f158	188	0x00000000
\$f159	189	0x00000000
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\$f161	191	0x00000000
\$f162	192	0x00000000
\$f163	193	0x00000000
\$f164	194	0x00000000
\$f165	195	0x00000000
\$f166	196	0x00000000
\$f167	197	0x00000000
\$f168	198	0x00000000
\$f169	199	0x00000000
\$f170	200	0x00000000
\$f171	201	0x00000000
\$f172	202	0x00000000
\$f173	203	0x00000000
\$f174	204	0x00000000
\$f175	205	0x00000000
\$f176	206	0x00000000
\$f177	207	0x00000000
\$f178	208	0x00000000
\$f179	209	0x00000000
\$f180	210	0x00000000
\$f181	211	0x00000000
\$f182	212	0x00000000
\$f183	213	0x00000000
\$f184	214	0x00000000
\$f185	215	0x00000000
\$f186	216	0x00000000
\$f187	217	0x00000000
\$f188	218	0x00000000
\$f189	219	0x00000000
\$f190	220	0x00000000
\$f191	221	0x00000000
\$f192	222	0x00000000
\$f193	223	0x00000000
\$f194	224	0x00000000
\$f195	225	0x00000000
\$f196	226	0x00000000
\$f197	227	0x00000000
\$f198	228	0x00000000
\$f199	229	0x00000000
\$f200	230	0x00000000
\$f201	231	0x00000000
\$f202	232	0x00000000
\$f203	233	0x00000000
\$f204	234	0x00000000
\$f205	235	0x00000000
\$f206	236	0x00000000
\$f207	237	0x00000000
\$f208	238	0x00000000
\$f209	239	0x00000000
\$f210	240	0x00000000
\$f211	241	0x00000000
\$f212	242	0x00000000
\$f213	243	0x00000000
\$f214	244	0x00000000
\$f215	245	0x00000000
\$f216	246	0x00000000
\$f217	247	0x00000000
\$f218	248	0x00000000
\$f219	249	0x00000000
\$f220	250	0x00000000
\$f221	251	0x00000000
\$f222	252	0x00000000
\$f223	253	0x00000000
\$f224	254	0x00000000
\$f225	255	0x00000000

EditExecute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x20900004	addi \$9,\$0,0x00000004	2: addi \$t1,\$zero, 4
	0x00400004	0x20940005	addi \$10,\$0,0x00000005	3: addi \$t2,\$zero, 5
	0x00400008	0x712a8002	mul \$16,\$9,\$10	5: mul \$s0,\$t1,\$t2
	0x0040000c	0x20010003	addi \$1,\$0,0x00000003	6: mul \$s0,\$s0,3
	0x00400010	0x72038002	mul \$16,\$16,\$1	

Thanh ghi hi không thay đổi giá trị vì kết quả dưới 32 bit, kết quả ở đây được ghi vào thanh ghi lo.

The screenshot shows the MARS MIPS simulator interface. On the left, the assembly code is displayed:

```
.data
X : .word 5
Y : .word -1
Z : .word
.text
la $t0, X
la $t9, Y
lw $t1, 0($t8)
lw $t2, 0($t9)

add $s0, $t1, $t1
add $s0, $s0, $t2

la $t7, Z
sw $s0, 0($t7)
```

On the right, the Register File window shows the state of registers:

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$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
\$t8	24	0x00000000
\$t9	25	0x00000000
\$k0	26	0x00000000
\$k1	27	0x00000000
\$gp	28	0x10000000
\$sp	29	0x7fffffc0
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400000
n1		0x00000000
lo		0x00000000

Edit

Execute

Text Segment

Bkpt	Address	Code	Basic	Source
<input type="checkbox"/>	0x00400000	0x3c011000	lui \$t, 0x00000001	7: la \$t8, X
<input type="checkbox"/>	0x00400004	0x34380000	r24 \$t1, 0x00000000	
<input type="checkbox"/>	0x00400008	0x3c011000	lui \$t, 0x00000001	8: la \$t9, Y
<input type="checkbox"/>	0x0040000C	0x34390004	ori \$t5, 0x00000004	
<input type="checkbox"/>	0x00400010	0xBF690000	w \$t9, 0x00000000 (\$t4)	9: lw \$t11, 0(\$t8)
<input type="checkbox"/>	0x00400014	0xBF3A0000	lw \$t10, 0x00000000 (\$t5)	10: lw \$t12, 0(\$t9)
<input type="checkbox"/>	0x00400018	0x01298020	add \$t6, \$t9, \$t9	12: add \$s0, \$t1, \$t1
<input type="checkbox"/>	0x0040001C	0x020a8020	add \$t6, \$t6, \$t10	13: add \$s0, \$s0, \$t2
<input type="checkbox"/>	0x00400020	0x3c011000	lui \$t1, 0x00000001	15: la \$t17, Z
<input type="checkbox"/>	0x00400024	0x342f0008	ori \$t5, \$t1, 0x00000008	
<input type="checkbox"/>	0x00400028	0xad7f0000	sw \$t6, 0x00000000 (\$t15)	16: sw \$s0, 0(\$t17)

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0x00000000	0xffffffff	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010004	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010008	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001000C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010010	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010014	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010018	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001001C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010020	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010024	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010028	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001002C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010030	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010034	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010038	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001003C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010040	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010044	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010048	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001004C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010050	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010054	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010058	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001005C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010060	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010064	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010068	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001006C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010070	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010074	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010078	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001007C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010080	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010084	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010088	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001008C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010090	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010094	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010098	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001009C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100A0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100A4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100A8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100AC	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100B0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100B4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100B8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100BC	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100C0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100C4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100C8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100CC	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100D0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100D4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100D8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100DC	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100E0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100E4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100E8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100EC	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100F0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100F4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100F8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x100100FC	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010100	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010104	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010108	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001010C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010110	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010114	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010118	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001011C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010120	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010124	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010128	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001012C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010130	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010134	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010138	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001013C	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010140	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010144	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x000000		

Tương ứng với hằng số khi biên dịch lên la thành mã máy.

Registers	Coproc 1	Coproc 0	
Name	Number		Value
\$zero	0		0x00000000
\$at	1		0x10010000
\$v0	2		0x00000000
\$v1	3		0x00000000
\$a0	4		0x00000000
\$a1	5		0x00000000
\$a2	6		0x00000000
\$a3	7		0x00000000
\$t0	8		0x00000000
\$t1	9		0x00000000
\$t2	10		0xffffffff
\$t3	11		0x00000000
\$t4	12		0x00000000
\$t5	13		0x00000000
\$t6	14		0x00000000
\$t7	15		0x10010000
\$s0	16		0x00000000
\$s1	17		0x00000000
\$s2	18		0x00000000
\$s3	19		0x00000000
\$s4	20		0x00000000
\$s5	21		0x00000000
\$s6	22		0x00000000
\$s7	23		0x00000000
\$t8	24		0x10010000
\$t9	25		0x10010000
\$k0	26		0x00000000
\$k1	27		0x00000000
\$gp	28		0x10000000
\$sp	29		0x7fffffff
\$fp	30		0x00000000
\$ra	31		0x00000000
pc			0x00400002
hi			0x00000000
lo			0x00000000

Labels

Label	Address ▲
mips6.asm	
X	0x10010000
Y	0x10010004
Z	0x10010008

☒ Data ☒ Text

Test Segment					
Bkpt	Code	Basic			
0x00400000	0x0c011001, ldr \$1, 0x00001001	7:	la	\$18, X	
0x00400004	0x34300000, ori \$2, \$1, 0x00000000				
0x00400008	0x3c011001, ldr \$1, 0x00000101	8:	la	\$19, Y	
0x0040000c	0x43900000, ori \$25, \$1, 0x00000000				
0x00400010	0x0f090000, ldr \$9, 0x00000000 (\$24)	9:	lw	\$11, 0(\$18)	
0x00400014	0x0f2a0000, ldr \$10, 0x00000000 (\$25)	10:	lw	\$12, 0(\$19)	
0x00400018	0x01298000, add \$16, \$9, \$9	12:	add	\$50, \$11, \$11	
0x0040001c	0x0c20a000, add \$16, \$10, \$10	13:	add	\$50, \$50, \$12	
0x00400020	0x3c011001, ldr \$1, 0x00000101	14:	la	\$17, Z	
0x00400024	0x2a470008, ori \$15, \$1, 0x00000000				
0x00400028	0x0f400000, sw \$16, 0x00000000 (\$15)	16:	sw	\$50, 0(\$17)	

[illegible][illegible]

Labels

Label

Address

mips6.asm

0x10010000

0x10010004

0x10010008

☒ Data☐ Text

Registers

Coproc 1

Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x10010000
\$v0	2	0x00000000
\$v1	3	0x10010000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$t8	16	0x00000000
\$t9	17	0x00000000
\$s0	18	0x00000000
\$s1	19	0x00000000
\$s2	20	0x00000000
\$s3	21	0x00000000
\$s4	22	0x00000000
\$s5	23	0x00000000
\$t0	24	0x10010000
\$t15	25	0x00000000
\$k0		
\$k1		
\$k2		
\$k3		
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Debugger window showing assembly code and registers. The assembly code is displayed in the main window, and the registers are shown on the right. The assembly code includes instructions like `la $t8, X`, `la $t9, Y`, `lw $t1, 0($t8)`, `lw $t2, 0($t9)`, `add $s0, $t1, $t1`, `add $s0, $s0, $t2`, `la $t7, Z`, and `sw $s0, 0($t7)`. The registers window shows the state of various registers, including `$zero`, `$at`, `$v0`, `$v1`, `$a0`, `$a1`, `$a2`, `$a3`, `$t0`, `$t1`, `$t2`, `$t3`, `$t4`, `$t5`, `$t6`, `$t7`, `$s0`, `$s1`, `$s2`, `$s3`, `$s4`, `$s5`, `$s6`, `$s7`, `$t8`, `$t9`, `$s8`, `$s9`, `$sp`, `$fp`, `$ra`, `$pc`, `$hi`, `$lo`, and `$eip`.

Debugger window showing assembly code and registers. The assembly code is displayed in the main window, and the registers are shown on the right. The assembly code includes instructions like `la $t8, X`, `la $t9, Y`, `lw $t1, 0($t8)`, `lw $t2, 0($t9)`, `add $s0, $t1, $t1`, `add $s0, $s0, $t2`, `la $t7, Z`, and `sw $s0, 0($t7)`. The registers window shows the state of various registers, including `$zero`, `$at`, `$v0`, `$v1`, `$a0`, `$a1`, `$a2`, `$a3`, `$t0`, `$t1`, `$t2`, `$t3`, `$t4`, `$t5`, `$t6`, `$t7`, `$s0`, `$s1`, `$s2`, `$s3`, `$s4`, `$s5`, `$s6`, `$s7`, `$t8`, `$t9`, `$s8`, `$s9`, `$sp`, `$fp`, `$ra`, `$pc`, `$hi`, `$lo`, and `$eip`.

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Edit Execute				Labels		Registers		
Text Segment				Label	Address	Name	Number	Value
Bkpt	Address	Code	Basic			\$zero	0	0x00000000
0x00400000	0x3c011001	lui \$1, 0x000001001	7: la \$t8, X			\$at	1	0x10010000
0x00400004	0x34390004	ori \$t4, \$1, 0x00000000				\$v0	2	0x00000000
0x00400008	0x3c011001	lui \$1, 0x000001001	8: la \$t9, Y			\$t1	3	0x00000000
0x0040000c	0x34390004	ori \$t5, \$1, 0x00000000				\$a0	4	0x00000000
0x00400010	0x8f2a0000	lw \$9, 0x00000000(\$t4)	9: lw \$t1, 0(\$t8)			\$a1	5	0x00000000
0x00400014	0x8f2a0000	lw \$10, 0x00000000(\$t5)	10: lw \$t2, 0(\$t9)			\$a2	6	0x00000000
0x00400018	0x01298020	add \$16, \$9, \$9	12: add \$s0, \$t1, \$t1			\$a3	7	0x00000000
0x0040001c	0x02a80020	add \$16, \$10, \$10	13: add \$s0, \$t2, \$t2			\$t0	8	0x00000000
0x00400020	0x3c011001	lui \$1, 0x000001001	15: la \$t7, Z			\$t4	12	0x00000000
0x00400024	0x342f0008	ori \$t5, \$1, 0x00000008				\$t5	13	0x00000000
0x00400028	0x8ff00000	sw \$16, 0x00000000(\$t5)	16: sw \$s0, 0(\$t7)			\$t6	14	0x00000000
						\$t7	15	0x00000000
						\$s0	16	0x0000000a
						\$s1	17	0x00000000
						\$s2	18	0x00000000
						\$s3	19	0x00000000
						\$s4	20	0x00000000
						\$s5	21	0x00000000
						\$s6	22	0x00000000
						\$s7	23	0x00000000
						\$s8	24	0x10010000
						\$t9	25	0x10010004
						\$k0	26	0x00000000
						\$gp	27	0x10080000
						\$fp	29	0x7fffffc0
						\$ra	30	0x00000000
						\$r4	31	0x00000000
						pc		0x00400028
						hi		0x00000000
						lo		0x00000000

Edit Execute				Labels		Registers		
Text Segment				Label	Address	Name	Number	Value
Bkpt	Address	Code	Basic			\$zero	0	0x00000000
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0x00400004	0x34390004	ori \$t4, \$1, 0x00000000				\$v0	2	0x00000000
0x00400008	0x3c011001	lui \$1, 0x000001001	8: la \$t9, Y			\$t1	3	0x00000000
0x0040000c	0x34390004	ori \$t5, \$1, 0x00000000				\$a0	4	0x00000000
0x00400010	0x8f2a0000	lw \$9, 0x00000000(\$t4)	9: lw \$t1, 0(\$t8)			\$a1	5	0x00000000
0x00400014	0x8f2a0000	lw \$10, 0x00000000(\$t5)	10: lw \$t2, 0(\$t9)			\$a2	6	0x00000000
0x00400018	0x01298020	add \$16, \$9, \$9	12: add \$s0, \$t1, \$t1			\$a3	7	0x00000000
0x0040001c	0x02a80020	add \$16, \$10, \$10	13: add \$s0, \$t2, \$t2			\$t0	8	0x00000000
0x00400020	0x3c011001	lui \$1, 0x000001001	15: la \$t7, Z			\$t4	12	0x00000000
0x00400024	0x342f0008	ori \$t5, \$1, 0x00000008				\$t5	13	0x00000000
0x00400028	0x8ff00000	sw \$16, 0x00000000(\$t5)	16: sw \$s0, 0(\$t7)			\$t6	14	0x00000000
						\$t7	15	0x10010008
						\$s0	16	0x0000000a
						\$s1	17	0x00000000
						\$s2	18	0x00000000
						\$s3	19	0x00000000
						\$s4	20	0x00000000
						\$s5	21	0x00000000
						\$s6	22	0x00000000
						\$s7	23	0x00000000
						\$s8	24	0x10010000
						\$t9	25	0x10010004
						\$k0	26	0x00000000
						\$k1	27	0x00000000
						\$gp	28	0x10080000
						\$fp	29	0x7fffffc0
						\$ra	30	0x00000000
						\$r4	31	0x00000000
						pc		0x00400028
						hi		0x00000000
						lo		0x00000000

*Sự thay đổi giá trị các thanh ghi :

\$at : 0x00000000 → 0x10010000

\$t8 : 0x00000000 → 0x10010000

\$t9 : 0x00000000 → 0x10010004

\$t1 : 0x00000000 → 0x00000005

\$t2 : 0x00000000 → 0xffffffff

\$s0 : 0x00000000 → 0x0000000a → 0x00000009

\$t7 : 0x00000000 → 0x10010008

- Vai trò của lệnh lw và sw :

lw \$rt, imm(\$rs) : gán giá trị của thanh ghi \$rs vào thanh ghi \$rt (\$rt = M[\$rs+imm])

ở đây lw gán \$t1 = \$t8 và \$t2 = \$t9

sw \$rt, imm(\$rs) : gán giá trị của thanh ghi \$rt vào thanh ghi \$rs (M[\$rs+imm] = \$rt)

- Các lệnh lb, sb:

lb : chép 1 byte tại vị trí trong bộ nhớ RAM vào byte thấp của thanh ghi.

sb : lưu một byte thấp trong thanh ghi vào vị trí trong bộ nhớ RAM.