

Assignment 1:

Th1: coong hai so trai dau

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KIMT\Assignment_Lab\week4\ass1.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

ass1.asm mips2.asm ass2a.asm ass3a.asm* ass3b.asm ass3d.asm ass3c.asm ass5.asm

```
1 .text
2 start:
3     li $s1, 10
4     li $s2, -20
5     li $t0, 0
6     addu $s3, $s1, $s2
7     xor $t1, $s1, $s2
8
9     bltz $t1, EXIT
10    slt $t2, $s3, $s1
11    bltz $s1, NEGATIVE
12    beq $t2, $zero, EXIT
13    j OVERFLOW
14 NEGATIVE:
15    bne $t2, $zero, EXIT
16 OVERFLOW:
17    li $t0, 1 #the result is overflow
18 EXIT:
```

Line: 4 Column: 13 ☒ Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

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	0xffffffff
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0x0000000a
\$s2	18	0xffffffff
\$s3	19	0xffffffff
\$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	0x10008000
\$sp	29	0x7fffffc0
\$fp	30	0x00000000
\$ra	31	0x00000000
\$PC		0x00400030
\$hi		0x00000000
\$lo		0x00000000

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Th2: Cong hai so duong tran

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KIMT\Assignment_Lab\week4\ass1.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

ass1.asm mips2.asm ass2a.asm ass3a.asm* ass3b.asm ass3d.asm ass3c.asm ass5.asm

```
1 .text
2 start:
3     li $s1, 0x7fffffff
4     li $s2, 0x10000000
5     li $t0, 0
6     addu $s3, $s1, $s2
7     xor $t1, $s1, $s2
8
9     bltz $t1, EXIT
10    slt $t2, $s3, $s1
11    bltz $s1, NEGATIVE
12    beq $t2, $zero, EXIT
13    j OVERFLOW
14 NEGATIVE:
15    bne $t2, $zero, EXIT
16 OVERFLOW:
17    li $t0, 1 #the result is overflow
18 EXIT:
```

Line: 3 Column: 13 ☒ Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

Registers	Coproc 1	Coproc 0
Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x10000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000001
\$t1	9	0xffffffff
\$t2	10	0x00000001
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0x7fffffff
\$s2	18	0x10000000
\$s3	19	0xffffffff
\$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	0x10008000
\$sp	29	0x7fffffc0
\$fp	30	0x00000000
\$ra	31	0x00000000
\$PC		0x00400030
\$hi		0x00000000
\$lo		0x00000000

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Th3: Hai so duong khong tran

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KTM\Assignment_Lab\week4\ass1.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

```
1 .text
2 start:
3     li $s1, 0x00000001
4     li $s2, 0x10000000
5     li $t0, 0
6     addu $s3, $s1, $s2
7     xor $t1, $s1, $s2
8
9     bltz $t1, EXIT
10    slt $t2, $s3, $s1
11    bltz $s1, NEGATIVE
12    beq $t2, $zero, EXIT
13    j OVERFLOW
14 NEGATIVE:
15     bne $t2, $zero, EXIT
16 OVERFLOW:
17     li $t0, 1 #the result is overflow
18 EXIT:
```

Line: 4 Column: 10 Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

Registers	Coproc 1	Coproc 0
Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x10000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000001
\$t1	9	0x10000001
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0x00000001
\$s2	18	0x10000000
\$s3	19	0x10000001
\$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	0x10008000
\$sp	29	0x7fffffc0
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400034
hi		0x00000000
lo		0x00000000

Th4: Hai so am tran

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KTM\Assignment_Lab\week4\ass1.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

```
1 .text
2 start:
3     li $s1, -0x7fffffff
4     li $s2, -0x10000000
5     li $t0, 0
6     addu $s3, $s1, $s2
7     xor $t1, $s1, $s2
8
9     bltz $t1, EXIT
10    slt $t2, $s3, $s1
11    bltz $s1, NEGATIVE
12    beq $t2, $zero, EXIT
13    j OVERFLOW
14 NEGATIVE:
15     bne $t2, $zero, EXIT
16 OVERFLOW:
17     li $t0, 1 #the result is overflow
18 EXIT:
```

Line: 3 Column: 21 Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

Registers	Coproc 1	Coproc 0
Name	Number	Value
\$zero	0	0x00000000
\$at	1	0xf0000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000001
\$t1	9	0x70000001
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0xf0000001
\$s2	18	0xf0000000
\$s3	19	0x70000001
\$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	0x10008000
\$sp	29	0x7fffffc0
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400038
hi		0x00000000
lo		0x00000000

Th5: Hai so am khong tran

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KTM\Assignment_Lab\week4\ass1.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0xf0000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0xffffffff
\$t2	10	0x00000001
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0xffffffff
\$s2	18	0xf0000000
\$s3	19	0xffffffff
\$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	0x10008000
\$sp	29	0x7ffffffc
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400034
hi		0x00000000
lo		0x00000000

```
1 .text
2 start:
3     li $s1, -0x00000001
4     li $s2, -0x10000000
5     li $t0, 0
6     addu $s3, $s1, $s2
7     xor $t1, $s1, $s2
8
9     bltz $t1, EXIT
10    slt $t2, $s3, $s1
11    bltz $s1, NEGATIVE
12    beq $t0, $zero, EXIT
13    j OVERFLOW
14 NEGATIVE:
15     bne $t2, $zero, EXIT
16 OVERFLOW:
17     li $t0, 1 #the result is overflow
18 EXIT:
```

Line: 4 Column: 11 Show Line Numbers

Mars Messages Run IO

Clear -- program is finished running (dropped off bottom) --

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Assignment 2:

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KIMT\Assignment_Lab\week4\ass2a.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

ass1.asm mips2.asm ass2a.asm ass3a.asm* ass3b.asm ass3d.asm ass3c.asm ass5.asm

```
1 .text
2 li $s0, 0x12345678
3
4 .EXTRACT_MSB
5 andi $t0, $s0, 0xffff0000
6
7 .CLEAR_LBS
8 andi $t1, $s0, 0xffffffff00
9
10 .SET_LBS
11 ori $t2, $s0, 0x000000ff
12
13 .CLEAR
14 andi $t3, $s0, 0x00000000
15
```

Line: 13 Column: 7 ☒ Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

Registers		
Coproc 1		
Coproc 0		
Name	Number	Value
\$zero	0	0x00000000
\$at	1	0xffffffff
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x12000000
\$t1	9	0x12345600
\$t2	10	0x123456ff
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x12345678
\$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	0x7fffffff
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400028
hi		0x00000000
lo		0x00000000

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Assignment 3:

a.

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KIMT\Assignment_Lab\week4\ass3a.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

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	0x00000008
\$s2	18	0x00000008
\$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		0x00400014
hi		0x00000000
lo		0x00000000

```
1 #abs
2
3 .text
4 addi $s1, $zero, 8
5 or $s2, $zero, $s1 #copy s1 into s2
6 slt $s3, $s1, $zero # s1 < 0, s3 = 1
7 beq $s3, $zero, exit #s3 = 0, s1 > 0
8 sub $s2, $zero, $s1 #s2 = 0 - s1, s1 < 0
9
10 exit:
11
```

Line: 2 Column: 1 Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

b.

C:\Users\ASUS\Desktop\ass3b.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

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	0xffffffff
\$s2	18	0xffffffff
\$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		0x00400008
hi		0x00000000
lo		0x00000000

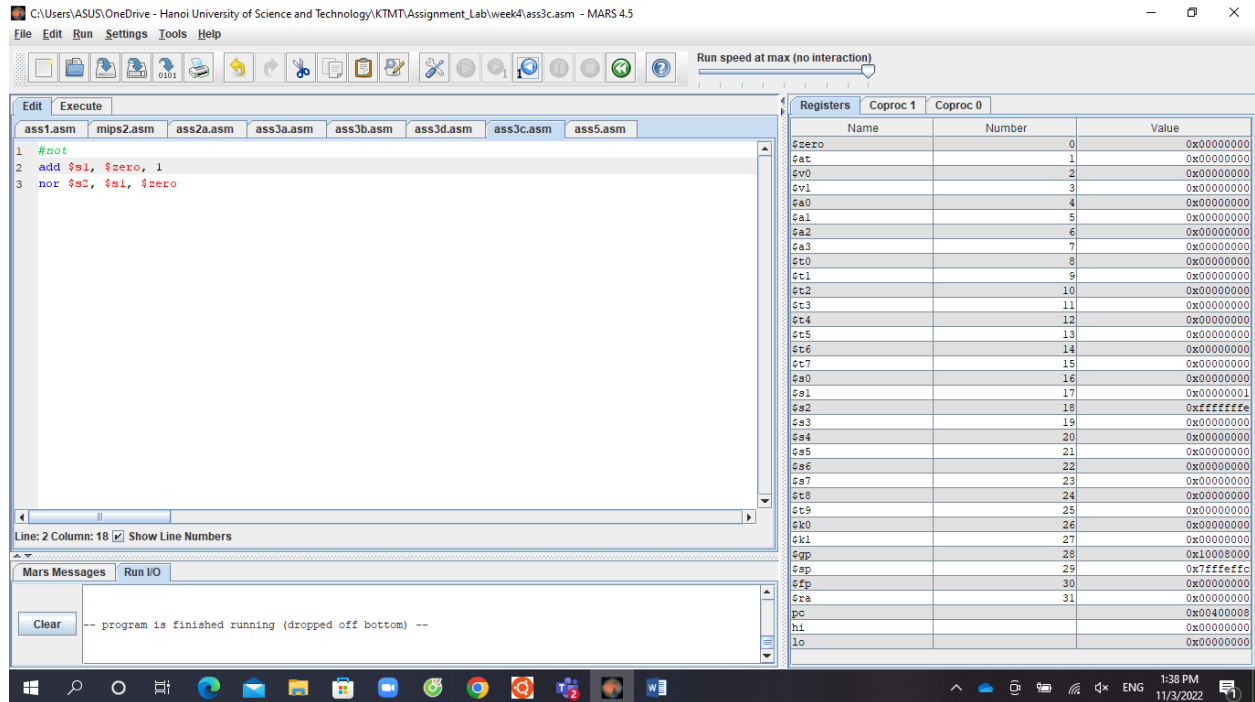
```
1 #move
2 add $s1, $zero, -8
3 add $s2, $zero, $s1
```

Line: 3 Column: 20 Show Line Numbers

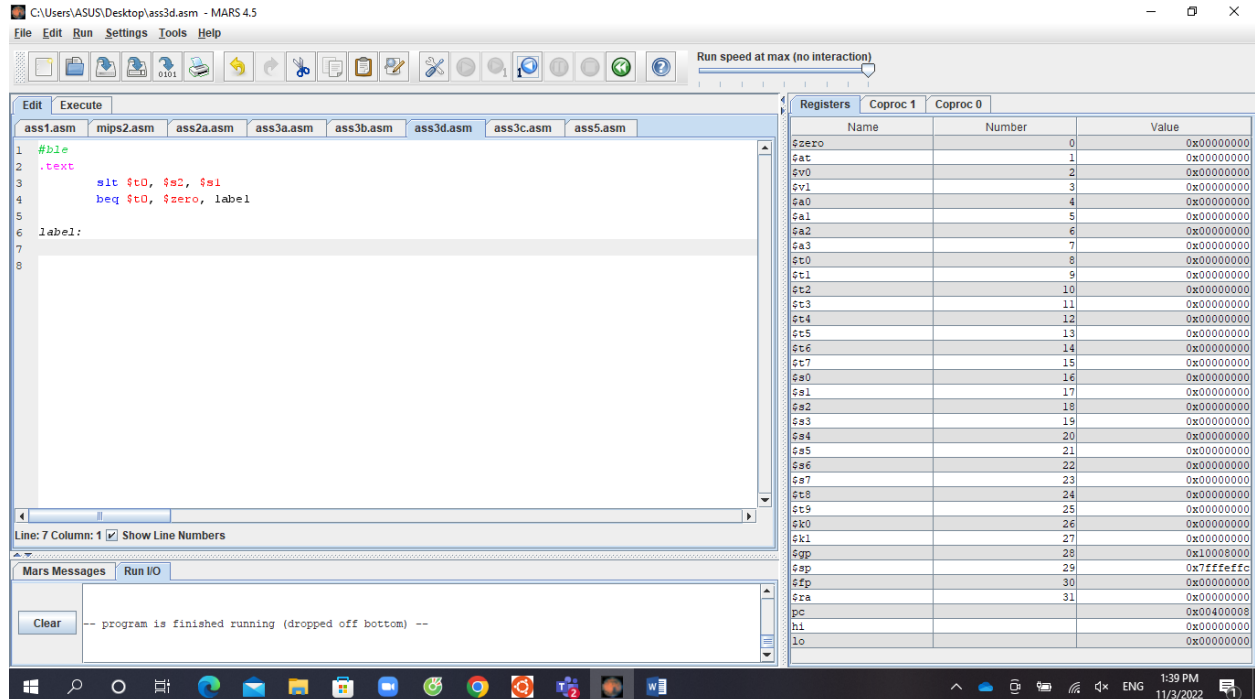
Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

C.



d.



Assignment4:

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KTMT\ass4.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x7fffffff
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x8000270f
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0xffffd8f0
\$s2	18	0x7fffffff
\$s3	19	0x7ffff8ef
\$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	0x10008000
\$sp	29	0x7ffffeffc
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x0040002c
hi		0x00000000
lo		0x00000000

```
1 .text
2     addi $s1, $zero, 0xffffd8f0
3     addi $s2, $zero, 0x7fffffff
4 start:
5     li $t0, 0 #no overflow
6     addu $s3, $s1, $s2
7
8     xor $t1, $s1, $s2 # test if s1 and s2 same sign
9     bltz $t1, exit #if not exit
10
11    xor $t1, $s3, $s2 #test if s3 and s2 the same sign
12    bltz $t1, overflow #if not, this is overflow
13
14 overflow:
15    li $t0, 1 #the result is overflow
16
17 exit:
18
```

Line: 5 Column: 25 Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --

Assignment 5:

C:\Users\ASUS\OneDrive - Hanoi University of Science and Technology\KTMT\Assignment_Lab\ass5.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

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	0x00000008
\$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	0x00000002
\$s2	18	0x00000002
\$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	0x10008000
\$sp	29	0x7ffffeffc
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400010
hi		0x00000000
lo		0x00000000

```
1 .text
2     addi $s1, $zero, 2 #co so
3     addi $s2, $zero, 3 #so mu'
4     addi $s2, $s2, -1 # 2* 2^(s-1)
5     sllv $t0, $s1, $s2
```

Line: 5 Column: 22 Show Line Numbers

Mars Messages Run I/O

Clear -- program is finished running (dropped off bottom) --