

Lab2 Task-2

CCCN 221 – Computer Architecture

Lab Instructor: Abdullah Abbasi

Submission Time: **As per BB**

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Student ID **2140632**

Instructions:

1. This is a closed book and closed notes.
2. Copying with colleagues will be marked 0.
3. For answer used this **text color**

Marks:

Exercises	1	1	Total
Allocated	1	1	2
Obtained			
CLO, PLO, SO	3.1, V3, S05	3.1, V3, S05	

Note: Student must attach the code and the screenshot of the Final output.

Assemble and run the code using MIPS/QtSPIM only.

1. Run the following code and attach the Final output. [1 Mark]

A. Fill the below table **values based on the following program.**

Register	Value Before Run	Value After Run
t0	0x00000000	0x00000004
t1	0x00000000	0x00000004

.data

no1: .word 2

no2: .word 4

.text

main:

lw \$t0, no1(\$zero)

lw \$t1, no2(\$zero)

move \$t2,\$t0

move \$t0, \$t1

move \$t1, \$t0

li \$v0,10

syscall

2. Write a MIPS program to divide two numbers “first number is **9** and second number is **4**” and prints its result with the values of **Quotient** and **Remainder** and attach the **screenshot of the Final output**.
[1 Mark]

Fill the values.

Register values	Value After Run
\$a0	0x00000001
\$t0	0x00000000
\$t1	0x00000009
\$s0	0x00000002
\$s1	0x00000000
hi	0x00000001
lo	0x00000002

.data

Msg0: .asciiz "Lab2 Task2 by Amin Selhabi 2140632"

Msg1: .asciiz "\n The result is: "

Msg2: .asciiz "\n The Quotient is: "

Msg3: .asciiz "\n The Remainder is: "

.text

#printing Msg0

li \$v0, 4

la \$a0, Msg0

syscall

#Calculating the division

addi \$t1, \$zero, 9

addi \$t2, \$zero, 4

div \$s0, \$t1, \$t2

#Quotient

mflo \$s3

#Remainder

mfhi \$s4

The result is:

li \$v0, 4

la \$a0, Msg1

syscall

li \$v0, 1

add \$a0, \$zero, \$s0

syscall

#Quotient

li \$v0, 4

la \$a0, Msg2

syscall

li \$v0, 1

add \$a0, \$zero, \$s3

syscall

#Remainder

li \$v0, 4

la \$a0, Msg3

syscall

li \$v0, 1

add \$a0, \$zero, \$s4

syscall

li \$v0, 10

syscall

C:\Users\tahma\OneDrive\Desktop\Computer Architecture LAB\Lab2 Task2.asm* - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Lab2 Task2.asm*

```
1 .data
2 Msg0: .asciiz "Lab2 Task2 by Amin Seihabi 2140632"
3 Msg1: .asciiz "\n The result is: "
4 Msg2: .asciiz "\n The Quotient is: "
5 Msg3: .asciiz "\n The Remainder is: "
6
7 .text
8 #printing Msg0
9 li $v0, 4
10 la $a0, Msg0
11 syscall
12
13 #Calculating the division
14 addi $t1, $zero, 9
15 addi $t2, $zero, 4
17 div $a0, $t1, $t2
18 #Quotient
19 mflo $s3
20 #Remainder
21 mfhi $s4
22
23 # The result is:
24 li $v0, 4
25 la $a0, Msg1
26 syscall
27 li $v0, 1
28 add $a0, $zero, $s0
29 syscall
30
31 #Quotient
32 li $v0, 4
33 la $a0, Msg2
34 syscall
35 li $v0, 1
36 add $a0, $zero, $s3
37 syscall
38
39 #Remainder
40 li $v0, 4
41 la $a0, Msg3
42 syscall
43 li $v0, 1
44 add $a0, $zero, $s4
45 syscall
46
```

Line: 22 Column: 1 Show Line Numbers

Mars Messages Run IO

Lab2 Task2 by Amin Seihabi 2140632
The result is: 2
The Quotient is: 2
The Remainder is: 1
-- program is finished running --

Clear

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
\$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
hi		0x00000000
lo		0x00000000

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Lab2 Task2.asm*

```
10 la $a0, Msg0
11 syscall
12
13 #Calculating the division
14 addi $t1, $zero, 9
15 addi $t2, $zero, 4
17 div $a0, $t1, $t2
18 #Quotient
19 mflo $s3
20 #Remainder
21 mfhi $s4
22
23 # The result is:
24 li $v0, 4
25 la $a0, Msg1
26 syscall
27 li $v0, 1
28 add $a0, $zero, $s0
29 syscall
30
31 #Quotient
32 li $v0, 4
33 la $a0, Msg2
34 syscall
35 li $v0, 1
36 add $a0, $zero, $s3
37 syscall
38
39 #Remainder
40 li $v0, 4
41 la $a0, Msg3
42 syscall
43 li $v0, 1
44 add $a0, $zero, $s4
45 syscall
46
```

Line: 22 Column: 1 Show Line Numbers

Mars Messages Run IO

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The result is: 2
The Quotient is: 2
The Remainder is: 1
-- program is finished running --

Clear

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
\$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
hi		0x00000000
lo		0x00000000

Edit Execute

Text Segment					Source
Byte	Address	Code	Basic		
<input type="checkbox"/>	0x00400000	0x24020004	addiu \$2,\$0,0x00000004	9: li \$v0, 4	
<input type="checkbox"/>	0x00400004	0x3c011001	lui \$1,0x00001001	10: la \$a0, \$a0	
<input type="checkbox"/>	0x00400008	0x34240000	ori \$4,\$1,0x00000000		
<input type="checkbox"/>	0x0040000c	0x0000000c	syscall	11: syscall	
<input type="checkbox"/>	0x00400010	0x20090009	addi \$9,\$0,0x00000009	15: addi \$t1, \$zero, 9	
<input type="checkbox"/>	0x00400014	0x200a0004	addi \$10,\$0,0x00000004	16: addi \$t2, \$zero, 4	
<input type="checkbox"/>	0x00400018	0x18400001	hbe \$10,\$0,0x00000001	17: div \$a0, \$t1, \$t2	
<input type="checkbox"/>	0x0040001c	0x0000000d	break		
<input type="checkbox"/>	0x00400020	0x012a001a	div \$9,\$10		
<input type="checkbox"/>	0x00400024	0x00000012	mflo \$16		
<input type="checkbox"/>	0x00400028	0x00000012	mflo \$16	19: mflo \$a3	
<input type="checkbox"/>	0x0040002c	0x00000010	mfhi \$20	21: mfhi \$a4	
<input type="checkbox"/>	0x00400030	0x24020004	addiu \$2,\$0,0x00000004	24: li \$v0, 4	
<input type="checkbox"/>	0x00400034	0x3c011001	lui \$1,0x00001001	25: la \$a0, \$a0	
<input type="checkbox"/>	0x00400038	0x34240023	ori \$4,\$1,0x00000023		
<input type="checkbox"/>	0x0040003c	0x0000000c	syscall	26: syscall	

Data Segment								
Address	Value (+0)	Value (-4)	Value (+8)	Value (+c)	Value (-10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0x1242614c	0x73615420	0x6220326b	0x6d412079	0x53206e69	0x61696c65	0x32206962	0x36303431
0x10010020	0x0a003233	0x65685420	0x73657220	0x20746c75	0x203a7369	0x54200a00	0x51206568	0x69746f75
0x10010040	0x20746e65	0x203a7369	0x54200a00	0x53206568	0x69616d65	0x7265646e	0x3a736920	0x00000020
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

0x10010000 (.data) ☒ Hexadecimal Addresses ☒ Hexadecimal Values ☐ ASCII

Registers				Coproc 1	Coproc 0
Name	Number		Value		
\$zero	0		0x00000000		
\$at	1		0x10010000		
\$v0	2		0x00000004		
\$v1	3		0x00000000		
\$a0	4		0x00000001		
\$a1	5		0x00000000		
\$a2	6		0x00000000		
\$a3	7		0x00000000		
\$t0	8		0x00000000		
\$t1	9		0x00000009		
\$t2	10		0x00000004		
\$t3	11		0x00000000		
\$t4	12		0x00000000		
\$t5	13		0x00000000		
\$t6	14		0x00000000		
\$t7	15		0x00000000		
\$a0	16		0x00000002		
\$a1	17		0x00000000		
\$a2	18		0x00000000		
\$a3	19		0x00000002		
\$a4	20		0x00000001		
\$a5	21		0x00000000		
\$a6	22		0x00000000		
\$a7	23		0x00000000		
\$s0	24		0x00000000		
\$s1	25		0x00000000		
\$s2	26		0x00000000		
\$k1	27		0x00000000		
\$gp	28		0x10008000		
\$sp	29		0x7ffffc00		
\$fp	30		0x00000000		
\$ra	31		0x00000000		
pc			0x0040003c		
\$1			0x00000001		
\$0			0x00000002		

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The result is: 2
The Quotient is: 2
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-- program is finished running --