

## CCCN 221 – Computer Architecture

### LAB#3-4 Task3

Task Date: As per BB

Submission Date: As per BB

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Student ID: **2140632**

**Note: Student must attach the code and the screenshot of the Final output using MIPS or Qtscmpm.**

Marks:

Exercises	1	Total
Allocated	4	4
Obtained		
CLO, PLO, SO	3.1, V3, S05	

#### Q1: Lab Task

Implement the following assembly program in Mars MIPS that performs the following tasks in sequence:

- Print an introduction that includes: **your name** and a short description of the program.
- Ask the user to enter two integers and save these in two registers.
- Perform **addition, subtraction, multiplication, and division** (**integer quotient**) on **two integers**.
- Display the results of **addition, subtraction, multiplication, and division**.
- Print “**Thank You!**” in the end.

#### Output Sample

Ali – This program will perform simple arithmetic on two integers inputted by user.

Enter first Number: **9**

Enter second number: **3**

Sum = 12

Difference = 6 (OR)

Product = 27 (OR)

Quotient = 3 (OR)

Thank You!

```
1 .data
2 MyMessage: .asciiz "Tom - This program will perform simple arithmetic on two integers inputted by user.\n"
3 Num1: .asciiz "\nEnter first number: "
4 Num2: .asciiz "\nEnter second number: "
5 Sum: .asciiz "\nSum = "
6 Diff: .asciiz "\nDifference = "
7 Product: .asciiz "\nProduct = "
8 Quotient: .asciiz "\nQuotient = "
9 Thanks: .asciiz "\nThank You!"
10
11 .text
12 #Following message
13 li $v0, 4
14 la $a0, MyMessage
15 syscall
16
17 #First number prompt
18 li $v0, 4
19 la $a0, Num1
20 syscall
21
22 #Input for the first number
23 li $v0, 5
24 syscall
25 move $t0, $v0
26
27 #Second number prompt
28 li $v0, 4
29 la $a0, Num2
30 syscall
31
```

Line: 1 Column: 1 Show Line Numbers

Mars Messages Run IO

Tom - This program will perform simple arithmetic on two integers inputted by user.

Enter first number: 10

Enter second number: 5

Sum = 15

Difference = 5

Product = 50

Quotient = 2

Thank You!

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

Lab3\_Task3.asm

20 li \$v0, 4

21 la \$a0, Num1

22 syscall

23

24 #Input for the second number

25 li \$v0, 5

26 syscall

27 move \$t1, \$v0

28

29 #Sum message

30 li \$v0, 4

31 la \$a0, Sum

32 syscall

33

34 #Sum calculation

35 li \$v0, 1

36 add \$a0, \$t0, \$t1

37 syscall

38

39 #Difference message

40 li \$v0, 4

41 la \$a0, Diff

42 syscall

43

44 #Difference calculation

45 li \$v0, 1

46 sub \$a0, \$t0, \$t1

47 syscall

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Lab3\_Task3.asm

```

53 li $v0, 1
54 mul $a0, $a0, $a1
55 syscall
56
57 #Product message
58 li $v0, 4
59 la $a0, Product
60 syscall
61
62 #Product calculation
63 li $v0, 1
64 mul $a0, $a0, $a1
65 syscall
66
67 #Quotient message
68 li $v0, 4
69 la $a0, Quotient
70 syscall
71
72 #Quotient calculation
73 li $v0, 1
74 div $a0, $a0, $a1
75 syscall
76
77 #Welcome message
78 li $v0, 4
79 la $a0, Thanks
80 syscall
81
82

```

Line: 55 Column: 8 [x] Show Line Numbers

Mars Messages Run IO

Tom - This program will perform simple arithmetic on two integers inputted by user.

Enter first number: 10

Enter second number: 5

Sum = 15  
Difference = 5  
Product = 50  
Quotient = 2

Thank You!  
-- program is finished running (dropped off bottom) --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000004
\$v1	3	0x00000000
\$a0	4	0x00000020
\$a1	5	0x00000005
\$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
\$s6	24	0x00000000
\$s7	25	0x00000000
\$s8	26	0x00000000
\$s9	27	0x00000000
\$s10	28	0x00000000
\$s11	29	0x00000000
\$s12	30	0x00000000
\$s13	31	0x00000000
\$s14	32	0x00000000
\$s15	33	0x00000000
\$s16	34	0x00000000
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\$s20	38	0x00000000
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\$s24	42	0x00000000
\$s25	43	0x00000000
\$s26	44	0x00000000
\$s27	45	0x00000000
\$s28	46	0x00000000
\$s29	47	0x00000000
\$s30	48	0x00000000
\$s31	49	0x00000000
\$s32	50	0x00000000
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\$s43	61	0x00000000
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\$s45	63	0x00000000
\$s46	64	0x00000000
\$s47	65	0x00000000
\$s48	66	0x00000000
\$s49	67	0x00000000
\$s50	68	0x00000000
\$s51	69	0x00000000
\$s52	70	0x00000000
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\$s63	81	0x00000000
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\$s66	84	0x00000000
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**.data**

**Mymessage: .asciiz "Tom - This program will perform simple arithmetic on two integers inputted by user.\n"**

**Num1: .asciiz "\nEnter first number: "**

**Num2: .asciiz "\nEnter second number: "**

**Sum: .asciiz "\nSum = "**

**Diff: .asciiz "\nDifference = "**

**Product: .asciiz "\nProduct = "**

**Quotient: .asciiz "\nQuotient = "**

**Thanks: .asciiz "\n\nThank You!"**

**.text**

**#Welcoming message**

**li \$v0, 4**

**la \$a0, Mymessage**

**syscall**

**#First number prompt**

**li \$v0, 4**

**la \$a0, Num1**

**syscall**

**#input for the first number**

**li \$v0, 5**

**syscall**

**move \$s0, \$v0**

**#Second number prompt**

**li \$v0, 4**

**la \$a0, Num2**

**syscall**

#input for the second number

li \$v0, 5

syscall

move \$s1, \$v0

#Sum message

li \$v0,4

la \$a0, Sum

syscall

#Sum calculation

li \$v0, 1

add \$a0, \$s0, \$s1

syscall

#Difference message

li \$v0, 4

la \$a0, Diff

syscall

#Difference calculation

li \$v0, 1

sub \$a0, \$s0, \$s1

syscall

#Product message

li \$v0, 4

la \$a0, Product

syscall

#Product calculation

li \$v0, 1

mul \$a0, \$s0, \$s1

syscall

#Quotient message

li \$v0, 4

la \$a0, Quotient

syscall

#Quotient calculation

li \$v0, 1

div \$a0, \$s0, \$s1

syscall

#Welcoming message

li \$v0, 4

la \$a0, Thanks

syscall