

Computer Organization & Architecture Lab

Lab Report # 01



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Registration No: 21PWCSE1993

Section: "A"

"On my honor, as student at University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work"

Student Signature: 

Submitted to:

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ASSESSMENT RUBRICS COA LABS

LAB REPORT ASSESSMENT				
Criteria	Excellent	Average	Nil	Marks Obtained
1. Objectives of Lab	All objectives of lab are properly covered [Marks 10]	Objectives of lab are partially covered [Marks 5]	Objectives of lab are not shown [Marks 0]	
2. MIPS instructions with Comments and proper indentations.	All the instructions are well written with comments explaining the code and properly indented [Marks 20]	Some instructions are missing are poorly commented code [Marks 10]	The instructions are not properly written [Marks 0]	
3. Simulation run without error and warnings	The code is running in the simulator without any error and warnings [Marks 10]	The code is running but with some warnings or errors. [Marks 5]	The code is written but not running due to errors [Marks 0]	
4. Procedure	All the instructions are written with proper procedure [Marks 20]	Some steps are missing [Marks 10]	steps are totally missing [Marks 0]	
5. OUTPUT	Proper output of the code written in assembly [Marks 20]	Some of the outputs are missing [Marks 10]	No or wrong output [Marks 0]	
6. Conclusion	Conclusion about the lab is shown and written [Marks 20]	Conclusion about the lab is partially shown	Conclusion about the lab is not shown[Marks0]	
7. Cheating			Any kind of cheating will lead to 0 Marks	
Total Marks Obtained: _____ Instructor Signature: _____				

Objectives:

- ARITHMETIC OPERATION IN QTSPIM (ASSEMBLY LANGUAGE)
- Addition
- Subtraction
- Division
- Multiplication
- Logical Operations

Question # 1:

```
addition.asm
1  .text
2  .globl main
3  main:
4      li $v0, 4
5      la $a0, input1
6      syscall
7
8      li $v0, 5
9      syscall
10     move $t0,$v0
11
12     li $v0, 4
13     la $a0, input2
14     syscall
15
16     li $v0, 5
17     syscall
18     move $t1,$v0
19
20     add $t3, $t0, $t1
21
22     li $v0, 4
23     la $a0, result
24     syscall
25
26     li $v0, 1
27     move $a0, $t3
28     syscall
29
30     .data
31     input1 : .asciiz "Enter First number = "
32     input2 : .asciiz "Enter 2nd number = "
33     result : .asciiz "Result = "
```

Output:

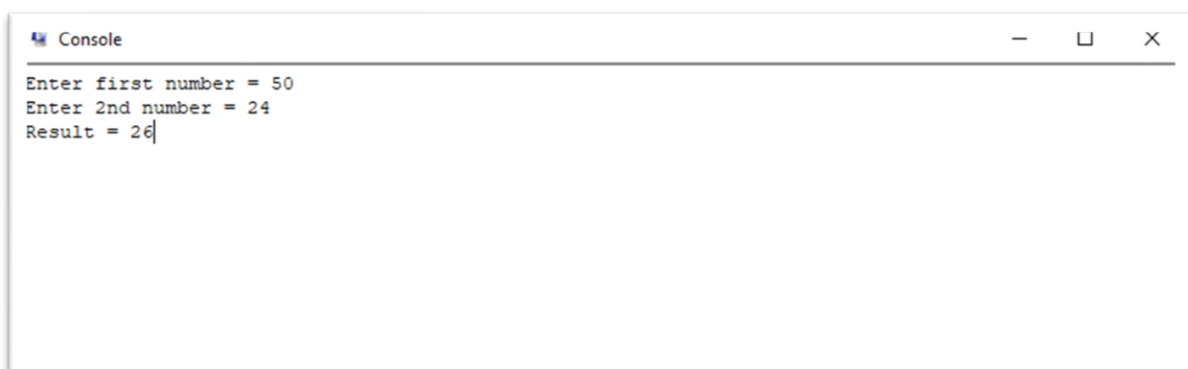


```
Console
Enter First number = 10
Enter 2nd number = 20
Result = 30
```

Question # 02.

```
[a9] subtraction.asm
1  .text
2  .globl main
3
4  main:
5      li $v0, 4
6      la $a0, input1
7      syscall
8
9      li $v0, 5
10     syscall
11     move $t0, $v0
12
13     li $v0, 4
14     la $a0, input2
15     syscall
16
17     li $v0, 5
18     syscall
19     move $t1, $v0
20
21     sub $t2, $t0, $t1
22
23     li $v0, 4
24     la $a0, result
25     syscall
26
27     li $v0, 1
28     move $a0, $t2
29     syscall
30
31 .data
32     input1 : .asciiz "Enter first number = "
33     input2 : .asciiz "Enter 2nd number = "
34     result : .asciiz "Result = "
```

Output:




The screenshot shows a console window titled "Console" with standard window controls (minimize, maximize, close). The output text is as follows:

```
Enter first number = 50
Enter 2nd number = 24
Result = 26|
```

Question # 03:

```
multiplication.asm
1  .text
2  .globl main
3
4  main:
5      li $v0, 4
6      la $a0, input1
7      syscall
8
9      li $v0, 5
10     syscall
11     move $t0, $v0
12
13     li $v0, 4
14     la $a0, input2
15     syscall
16
17     li $v0, 5
18     syscall
19     move $t1, $v0
20
21     mul $t2,$t0, $t1
22
23     li $v0, 4
24     la $a0 ,result
25     syscall
26
27     li $v0, 1
28     move $a0, $t2
29     syscall
30
31 .data
32     input1 : .asciiz "Enter First number = "
33     input2 : .asciiz "Enter 2nd number = "
34     result : .asciiz "Result = "
```

Output:

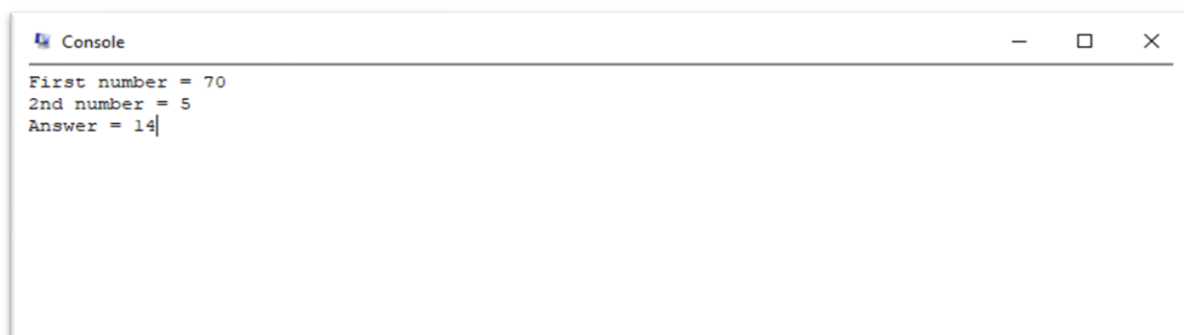


```
Console
Enter First number = 15
Enter 2nd number = 4
Result = 60
```

Question # 04:

```
division.asm
1  .text
2  .globl main
3
4  main:
5      li $v0, 4
6      la $a0, input1
7      syscall
8
9      li $v0, 5
10     syscall
11     move $t0, $v0
12
13     li $v0, 4
14     la $a0, input2
15     syscall
16
17     li $v0, 5
18     syscall
19     move $t1, $v0
20
21     div $t2, $t0, $t1
22
23     li $v0, 4
24     la $a0, result
25     syscall
26
27     li $v0, 1
28     move $a0, $t2
29     syscall
30
31 .data
32     input1 : .asciiz "First number = "
33     input2 : .asciiz "2nd number = "
34     result : .asciiz "Answer = "
```

Output:



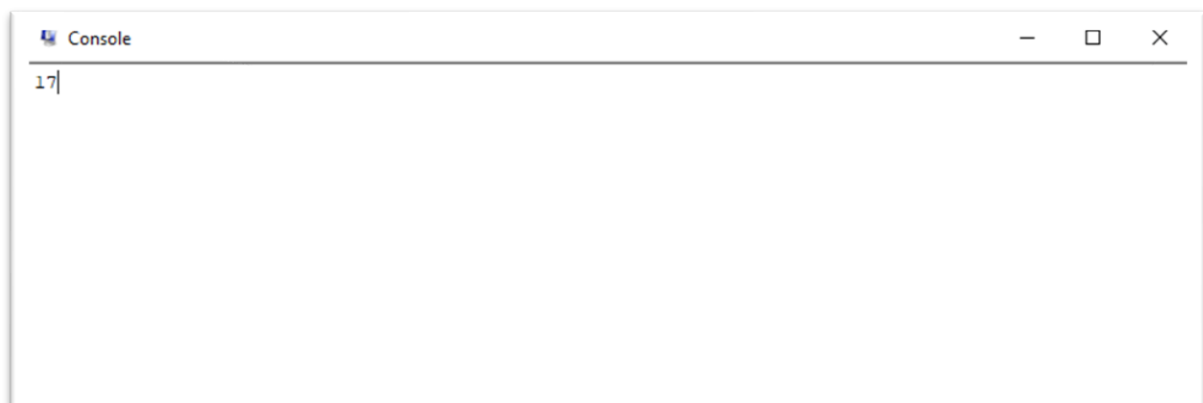
The screenshot shows a console window titled "Console" with the following output:

```
First number = 70
2nd number = 5
Answer = 14|
```

Question # 06:

```
Logical.asm
1  .text
2  .globl main
3
4  main:
5      li $t0, 5
6      li $t1, 3
7
8      and $t2,$t0,$t1
9      or $t3, $t0, $t1
10
11     li $v0, 1
12     move $a0, $t2
13     syscall
14
15     li $v0, 1
16     move $a0, $t3
17     syscall
18
19
20 .data
21 result : .space 4
22 result2 : .space 4
```

Output:



Conclusion:

In this lab, we learned how to write assembly language programs to perform arithmetic and logical operations in MIPS. We wrote assembly language programs to add, subtract, multiply, and divide two numbers. We also wrote assembly language programs to perform AND, OR, and NOT operations.
