

Lab 03 – Worksheet

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Note: Assumptions and logics should be explained separately in tasks after the task results.

Task 1

Provide appropriately commented codes (Mention question part before each part)

```
# addi a0 x0 1
# addi a1 x0 42
# ecall

addi x10,x0,12
addi x11,x0,12
jal x1, sum #calls the function named sum
addi x11, x10, 0
li x10,1
ecall
j exit

sum:
add x10,x11,x10
jalr x0,0(x1)

exit:
```

Add screenshot of your results (register)

```
x01 (ra) = 0x0000000C  
x10 (a0) = 0x00000001  
x11 (a1) = 0x00000018
```

Task 2

Provide appropriately commented codes (Mention question part before each part)

```
.text  
.globl main  
main:  
  
li x10, 8 #g  
li x11, 7 #h  
li x12, 6 #i  
li x13, 5 #j  
  
li x20, 0 #f  
  
addi sp, sp, -12
```

```
sw x20, 8(sp)
sw x19, 4(sp)
sw x18, 0(sp)
```

```
jal x1, sum
```

```
lw x18, 0(sp)
lw x19, 4(sp)
lw x20, 8(sp)
```

```
addi sp, sp, 12
```

```
addi x11, x10, 0
li x10, 1
ecall
```

```
end:
```

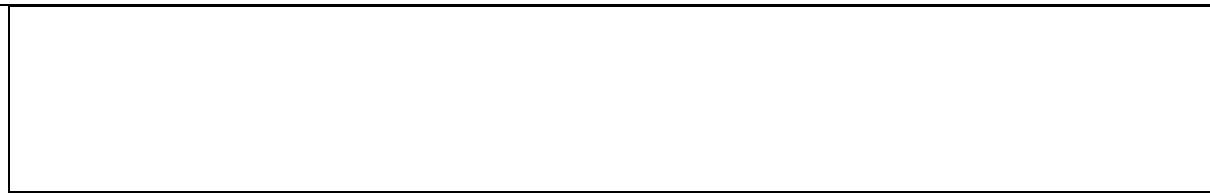
```
j end
```

```
sum:
```

```
add x18, x10, x11
add x19, x12, x13
sub x10, x18, x19
```

```
jalr x0, 0(x1)
```

Add screenshot of your results



x08 (s0)	= 0x00000000
x09 (s1)	= 0x00000000
x10 (a0)	= 0x00000001
x11 (a1)	= 0x00000004
x12 (a2)	= 0x00000006
x13 (a3)	= 0x00000005
x14 (a4)	= 0x00000000
x15 (a5)	= 0x00000000

Task 3 Provide appropriately commented codes (Mention question part before each part)

```
.text
.globl main

main:
    li x10, 0x100 #v
    li x11, 0 #k
    li x9, 0 #temp

    li x6, 5
    sw x6, 0(x10)
    li x6, 2
    sw x6, 4(x10)

    li x11, 0

    jal x1, swap

    li x10, 1
    ecall

end:
    j end

swap:
    slli x9, x11, 2 #temp=k*4
    add x9, x10, x9 #temp=&v[k]
    lw x12, 0(x9)
    lw x13, 4(x9)
    sw x13, 0(x9)
    sw x12, 4(x9)
```

```
swap:  
    slli x9, x11, 2 #temp=k*4  
    add x9, x10, x9 #temp=&v[k]  
    lw x12, 0(x9)  
    lw x13, 4(x9)  
    sw x13, 0(x9)  
    sw x12, 4(x9)  
  
    addi, x11, x12, 0  
    jalr x0, 0(x1)
```

Add screenshots of your results

0x00000104	02	00	00	00
0x00000100	05	00	00	00

0x00000104	05	00	00	00
0x00000100	02	00	00	00

```
x09 (s1) = 0x00000100
x10 (a0) = 0x00000100
x11 (a1) = 0x00000005
x12 (a2) = 0x00000005
x13 (a3) = 0x00000002
```

Task 4 Provide appropriately commented codes

```
.text
.globl main
.text
.globl main
main:
    li x10, 0x100
    li x11, 0x200
    li x19, 0
    li x6, 'A'
    sb x6, 0(x11)
    li x6, 'M'
    sb x6, 4(x11)
    li x6, 'M'
    sb x6, 8(x11)
    li x6, 'K'
    sb x6, 12(x11)
    addi sp, sp, -12
    sw x11, 8(sp)
    sw x10, 4(sp)
    sw x19, 0(sp)

loop1:
    lb x17, 0(x11)
    sb x17, 0(x10)
    beq x17, x0, exit
    addi x10, x10, 4
    addi x11, x11, 4
    addi x19, x19, 1
    j loop

exit:
    lw x11, 8(sp)
    lw x10, 4(sp)
    lw x19, 0(sp)
    addi sp, sp, 12
```

Add screenshots of your results

x00 (zero) = 0x00000000				
x01 (ra) = 0x00000068				
x02 (sp) = 0x7FFFFFFE4				
x03 (gp) = 0x100000000				
x04 (tp) = 0x000000000				
x05 (t0) = 0x000000000				
x06 (t1) = 0x00000004B				
x07 (t2) = 0x000000000				
x08 (s0) = 0x000000000				
x09 (s1) = 0x000000000				
x10 (a0) = 0x00000100				
x11 (a1) = 0x00000200				
x12 (a2) = 0x000000000				
x13 (a3) = 0x000000000				
x14 (a4) = 0x000000000				
x15 (a5) = 0x000000000				
x16 (a6) = 0x000000000				
x17 (a7) = 0x000000000				
x18 (s2) = 0x000000000				
x19 (s3) = 0x000000000				
x20 (s4) = 0x000000000				
0x0000010C	4B	00	00	00
0x00000108	4D	00	00	00
0x00000104	4D	00	00	00
0x00000100	41	00	00	00

Lab 03 – Worksheet

Lab 03 – Introduction to RISC V Assembly (Jumps and Returns)

Assessment Rubrics

Points Distribution

Task No.	LR2 Code	LR5 Results	AR7 Report Submission and Git Upload	
Task 1	/10	/05	/10 & /10	
Task 2	/10	/10		
Task 3	/10	/10		
Task 4	/15	/10		
Total Points	/100 Points			
CLO Mapped	CLO 2			

For description of different levels of the mapped rubrics, please refer the provided Lab Evaluation Assessment Rubrics and Affective Domain Assessment Rubrics.

#	Assessment Elements	Level 1: Unsatisfactory Points 0-1	Level 2: Developing Points 2	Level 3:Good Points 3	Level 4:Exemplary Points 4
LR2	Program/Code / Simulation Model/ Network Model	Program/code/simulation model/network model does not implement the required functionality and has several errors. The student is not able to utilize even the basic tools of the software.	Program/code/simulation model/network model has some errors and does not produce completely accurate results. Student has limited command on the basic tools of the software.	Program/code/simulation model/network model gives correct output but not efficiently implemented or implemented by computationally complex routine.	Program/code/simulation /network model is efficiently implemented and gives correct output. Student has full command on the basic tools of the software.
LR5	Results & Plots	Figures/ graphs / tables are not developed or are poorly constructed with erroneous results. Titles, captions, units are not mentioned. Data is presented in an obscure manner.	Figures, graphs and tables are drawn but contain errors. Titles, captions, units are not accurate. Data presentation is not too clear.	All figures, graphs, tables are correctly drawn but contain minor errors or some of the details are missing.	Figures / graphs / tables are correctly drawn and appropriate titles/captions and proper units are mentioned. Data presentation is systematic.
AR9	Report	All the in-lab tasks are not included in report and / or the report is submitted too late.	Most of the tasks are included in report but are not well explained. All the necessary figures / plots are not included. Report is submitted after due date.	Good summary of most the in-lab tasks is included in report. The work is supported by figures and plots with explanations. The report is submitted timely.	Detailed summary of the in-lab tasks is provided. All tasks are included and explained well. Data is presented clearly including all the necessary figures, plots and tables.