

Computer Organization and Architecture

Post-Lab Report

Lab 03



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Class	Computer Organization and Architecture CPE343(BCE-5B)
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POST LAB

Question:

Write a program that first inputs total no. of student. It then gets student roll no. and marks secured by that student, and stores both in memory. After that it waits in a loop asking to enter roll no. On getting roll no. it displays the marks secured by that roll no. If user enters roll no 9999, it terminates

Solution:

I am attaching my commented code below,

```
#Title : Lab 4 Task 1.                               Filename: Lab4Task1.asm
#Author: Muhammad Haris Irfan.                       Date: 06-10-20
#Roll Number: FA18-BCE-090                           Description:
#Registers: $t1, $t2, $t3,$t4, $v0, $a0
##### Data Segment #####
.data

.data

rollNo:.space 200
marks:.space 200
prompt:.asciiz "\nPlease enter number of students:"
rollNoMSg:.asciiz "Please enter roll number: "
markMSg: .asciiz "Please enter marks: "
searchMsg: .asciiz "\nPlease enter roll number to get "

##mark: "
marksMSg:.asciiz "\nMarks of student is:"
notFound: .asciiz "\nID not found!"
.globl main
##### Code Segment#####
.text

main:

li $v0,4
la $a0,prompt #it will print prompt
syscall
li $v0,5
syscall #ask user input
move $s0,$v0 #save a to t1
la $a3,rollNo
la $a2,marks
li $t0,0 #index

loop:
mul $t1,$t0,4 #get index of i
add $t2,$t1,$a3 #get index of rollNo]
```

```

add $t3,$t1,$a2 #get index of marksli]
li $v0,4
la $a0,rollNoMSg #it will print prompt
syscall
li $v0,5

```

```

syscall
sw $v0,($t2) #save rollNumber
li $v0,4
la $a0,markMSg #it will print prompt
syscall
li $v0,5
syscall
sw $v0,($t3) #save marks
addi $t0,$t0,1 #i++
blt $t0,$s0 loop

```

while:

```

li $v0,4
la $a0,searchMsg #it will print prompt
syscall
li $v0,5
syscall
beq $v0,9999,Exit
li $t0,0 #index

```

```

loopSearch:
mul $t1,$t0,4 #get index of i
add $t2,$t1,$a3 #get index of array

```

```

Lw $t2,($t2) #get value of arrayll
beq $t2,$v0,found
addi $t0,$t0,1 #i++
blt $t0,$s0 loopSearch
li $v0,4
la $a0,notFound #it will print prompt
syscall
j while

```

```

found:
add $t2,$t1,$a2 #get index of array[i]
lw $t2,($t2) #get value of array[i]
li $v0,4
la $a0,marksMSg #it will print prompt
syscall
li $v0,1
move $a0,$t2
syscall
j while
Exit:
li $v0,10

```

The result for this program is shown below,

The screenshot shows the MARS MIPS simulator interface. The main window displays the following text:

```
Please enter number of students:2
Please enter roll number: 90
Please enter marks: 300
Please enter roll number: 3
Please enter marks: 900

Please enter roll number to get 3

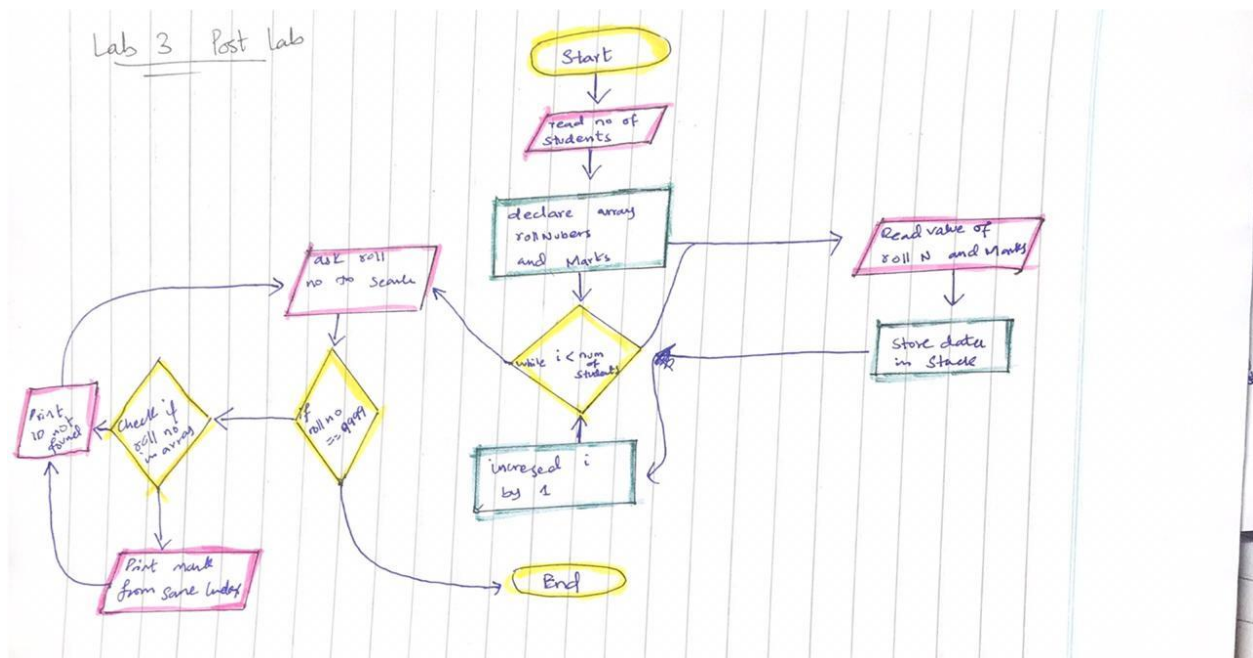
Marks of student is:900
Please enter roll number to get 9999

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

Below the text is a "Clear" button. To the right, the "Registers" window shows the state of the MIPS registers:

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x0000270f
\$v0	2	0x0000270f
\$v1	3	0x00000000
\$a0	4	0x100101e2
\$a1	5	0x00000000
\$a2	6	0x100100c9
\$a3	7	0x10010000
\$t0	8	0x00000001
\$t1	9	0x00000004
\$t2	10	0x00000384
\$t3	11	0x100100cc
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000002
\$s1	17	0x00000000
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s8	24	0x00000000
\$s9	25	0x00000000
\$k0	26	0x00000000
\$k1	27	0x00000000
\$gp	28	0x10008000
\$sp	29	0x7fffffc
\$fp	30	0x00000000
\$ra	31	0x00000000
pc		0x00400104
hi		0x00000000
lo		0x00000004

Flow chart of the task:



Critical Analysis/ Conclusion:

In This lab, we learnt about Stacks, through implementation we learnt how to use lw(Load word) and sw(Store word) commands to put and get data from a stack. We also implemented these commands in Different tasks. Moreover, we made handwritten Flowcharts for each task, depicting the working of our code.

_____THE END_____

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