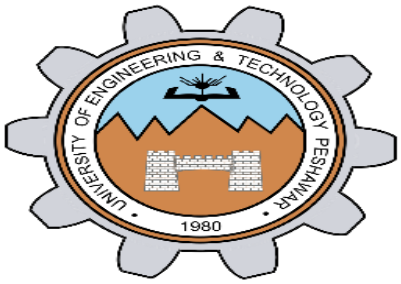
Lab report no 3



Fall 2020

Computer Architecture and Organization Lab

Submitted by:

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Section: **A**

Date: 1,12,2021

Submitted to:

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Task no 1: -

(printing strings for entering integers and then result)

```
.data
 myinfo: .asciiz " Muhammad Ali, 19pwcse1801
 msg1: .asciiz "enter a number \n"
 msg2: .asciiz "enter another\n"
 msg3: .asciiz "result is \n"
 space: .asciiz "\n"

 .text

     #display name and reg.no
    li $v0 ,4
    la $a0 ,myinfo
    syscall
  #display string
    li $v0 ,4
    la $a0 ,msg1
    syscall

   li $v0 ,5
    syscall
    move  $t0 ,$v0

   li $v0 ,4
    la $a0 ,msg2
```

```
 syscall



 li $v0 ,5
 syscall
 move  $t1 ,$v0

 #space
  li $v0 ,4
    la $a0 ,space
     syscall

add $t2,$t1 $t0
li $v0, 4
la $a0, msg3
syscall

li $v0 ,1
move $a0,$t2
syscall

 li $v0 ,10
 syscall
```

Registers: -

Registers | Coproc 1 | Coproc 0

Name	Number	Value
$zero	0	0x00000000
$at	1	0x10010000
$v0	2	0x0000000a
$v1	3	0x00000000
$a0	4	0x00000002
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000001
$t1	9	0x00000001
$t2	10	0x00000002
$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	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400080

Console: -

Mars Messages | Run I/O

Clear

```
 Muhammad Ali, 19pwcse1801
enter a number
1
enter another
```

Mars Messages | Run I/O

Clear

```
1


result is
2
```

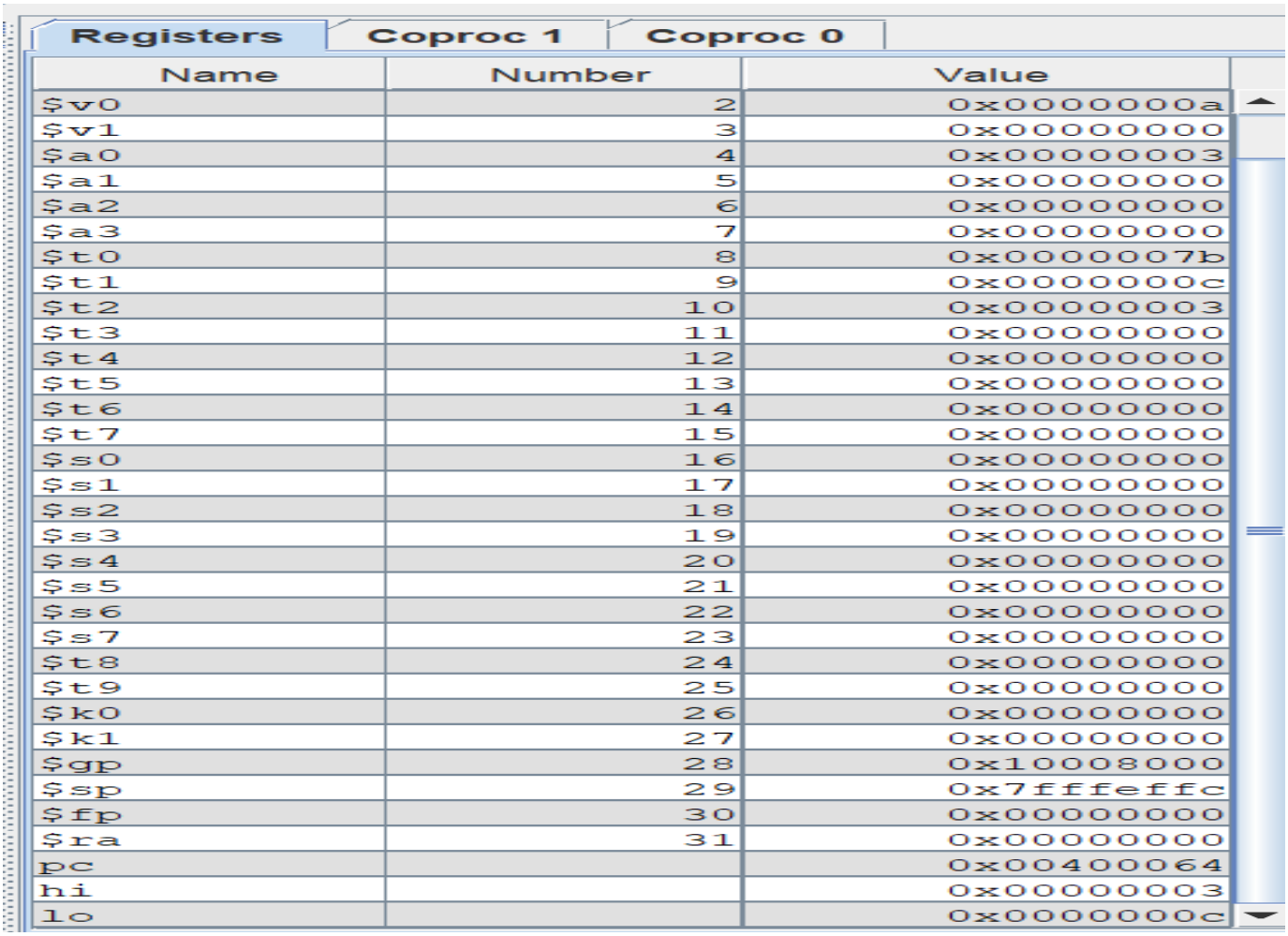
Task no 2: -

(Display the last digit of a number enter by user).

```
.data
myinfo: .asciiz " Muhammad Ali, 19pwcse1801 \n"
msg1: .asciiz "enter a number \n"
msg2: .asciiz "last digit is \n"
.text
    #display name and reg.no
   li $v0 ,4
   la $a0 ,myinfo
   syscall
  #display string
   li $v0 ,4
   la $a0 ,msg1
   syscall

  li $v0 ,5
   syscall
   move  $t0 ,$v0

 li $v0 ,4
   la $a0 ,msg2
   syscall

 div $t1,$t0,10
```

```
mfhi $t2
syscall

li $v0 ,1
move $a0,$t2
syscall

li $v0 ,10
syscall
```

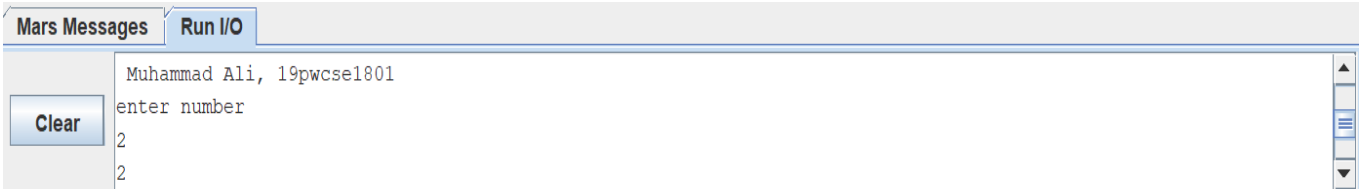
Registers: -

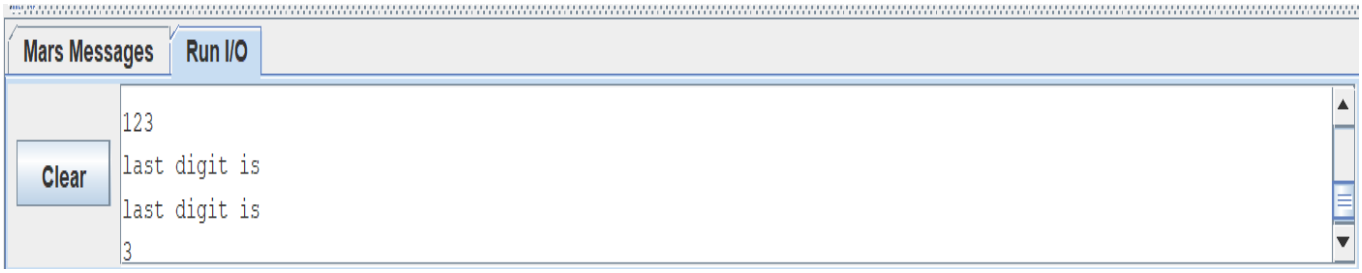


Registers | Coproc 1 | Coproc 0

Name	Number	Value
$v0	2	0x0000000a
$v1	3	0x00000000
$a0	4	0x00000003
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x0000007b
$t1	9	0x0000000c
$t2	10	0x00000003
$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	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400064
hi		0x00000003
lo		0x0000000c

Consul: -



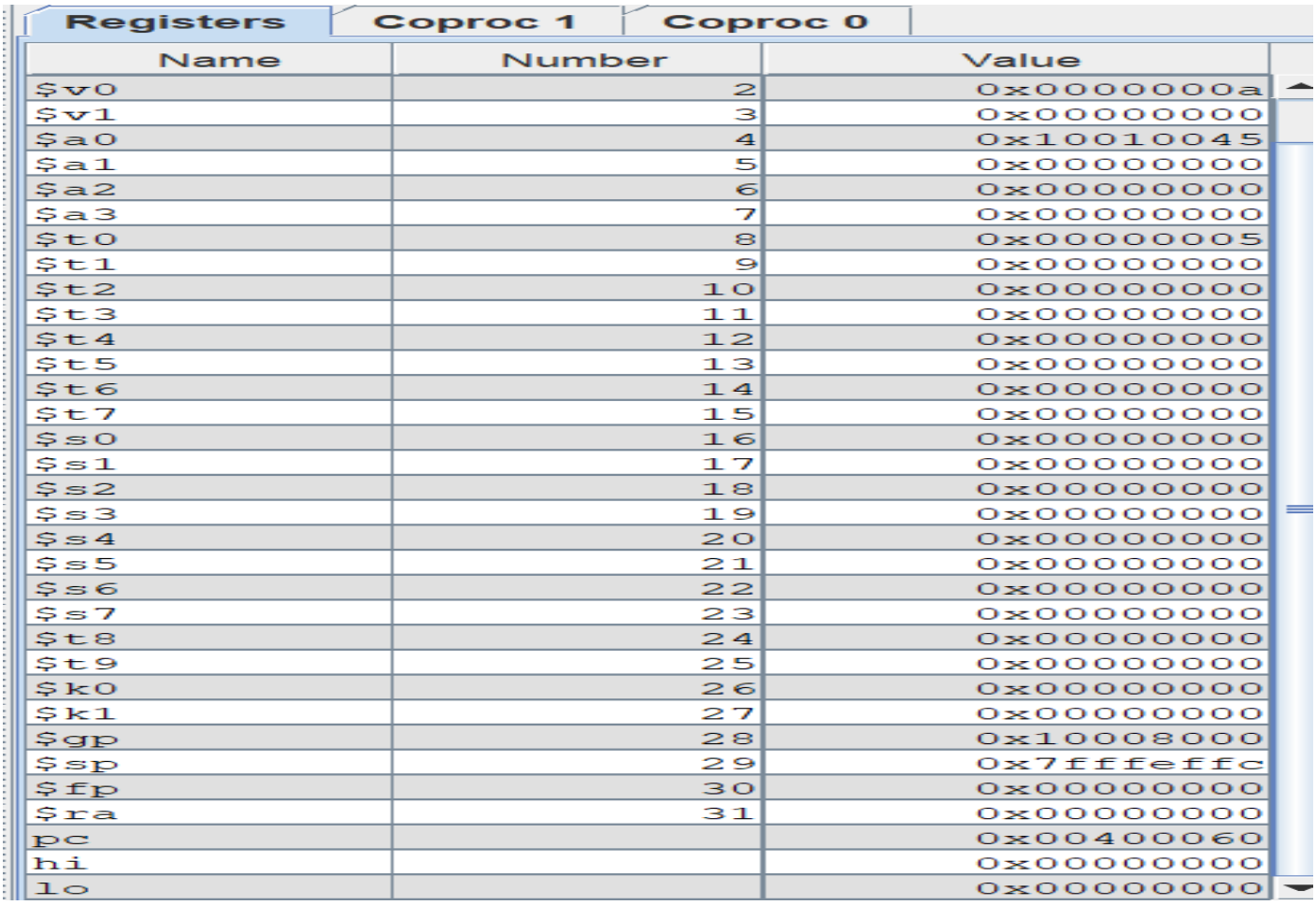


Task no 3: - “using bgt (branch greater than) to compare two numbers”

```
.data
 myinfo: .asciiz " Muhammad Ali, 19pwcse1801 \n"
  msg1: .asciiz "enter number \n"
 msg2: .asciiz "number is negative or 0\n"
 msg3: .asciiz "number is greater than zero \n"
 .text


     #display name and reg.no
    li $v0 ,4
    la $a0 ,myinfo
    syscall
```

```
#display string
  li $v0 ,4
  la $a0 ,msg1
  syscall

 li $v0 ,5
  syscall
  move  $t0 ,$v0

  bgt $t0 ,$zero ,label
  li $v0 ,4
  la $a0 ,msg2
  syscall
  b khansab

label:
li $v0 ,4
  la $a0 ,msg3
  syscall
khansab:
 li $v0 ,10
 syscall
```

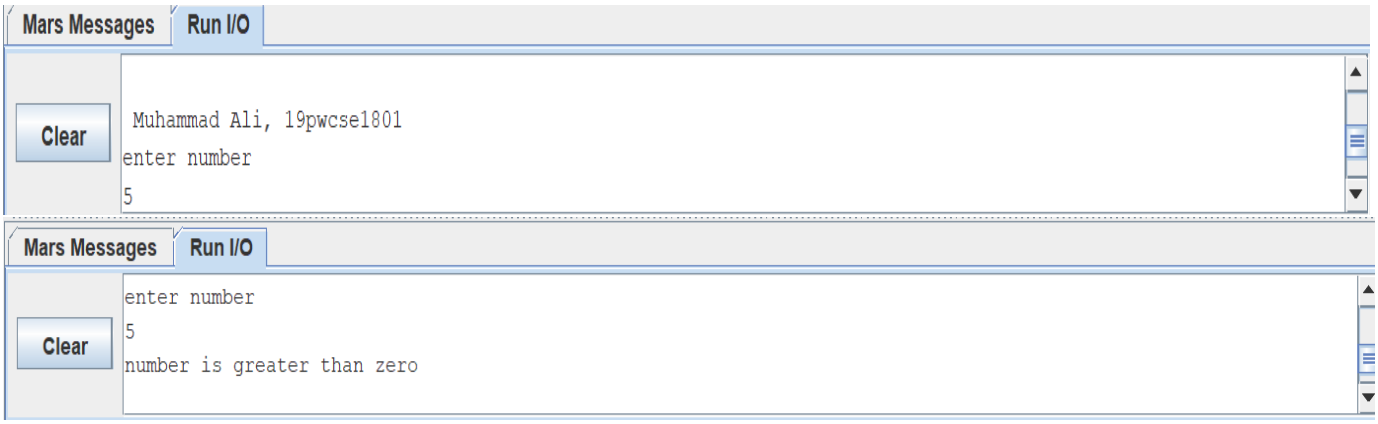
Registers: -



Registers | Coproc 1 | Coproc 0

Name	Number	Value
$v0	2	0x0000000a
$v1	3	0x00000000
$a0	4	0x10010045
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000005
$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	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400060
hi		0x00000000
lo		0x00000000

Consul: -



Task no 4: -

“using bqe (branch equal) to compare equality of two numbers inter by user ”

```
.data
 myinfo: .asciiz " Muhammad Ali, 19pwcse1801 \n"
  msg1: .asciiz "enter number \n"
 msg2: .asciiz "numbers are equal \n"
 msg3: .asciiz "number are not equal \n"
 .text


     #display name and reg.no
    li $v0 ,4
    la $a0 ,myinfo
    syscall
  #display string
    li $v0 ,4
    la $a0 ,msg1
    syscall


   li $v0 ,5
    syscall
    move  $t0 ,$v0


    li $v0 ,5
    syscall
    move  $t1 ,$v0
```

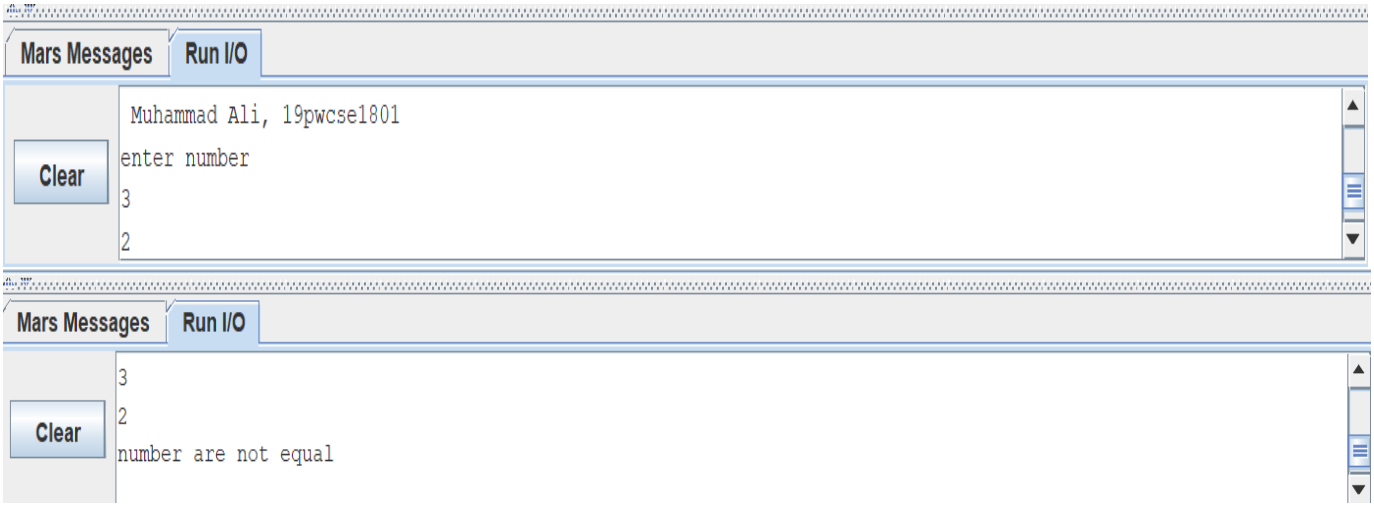
```
beq $t0 ,$t1 ,label
li $v0 ,4
la $a0 ,msg3
syscall
b khansab

label:
li $v0 ,4
la $a0 ,msg2
syscall
khansab:
li $v0 ,10
syscall
```

Registers: -

Registers | Coproc 1 | Coproc 0

Name	Number	Value
$v0	2	0x0000000a
$v1	3	0x00000000
$a0	4	0x10010040
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000003
$t1	9	0x00000002
$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	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400068
hi		0x00000000
lo		0x00000000

Consul: -



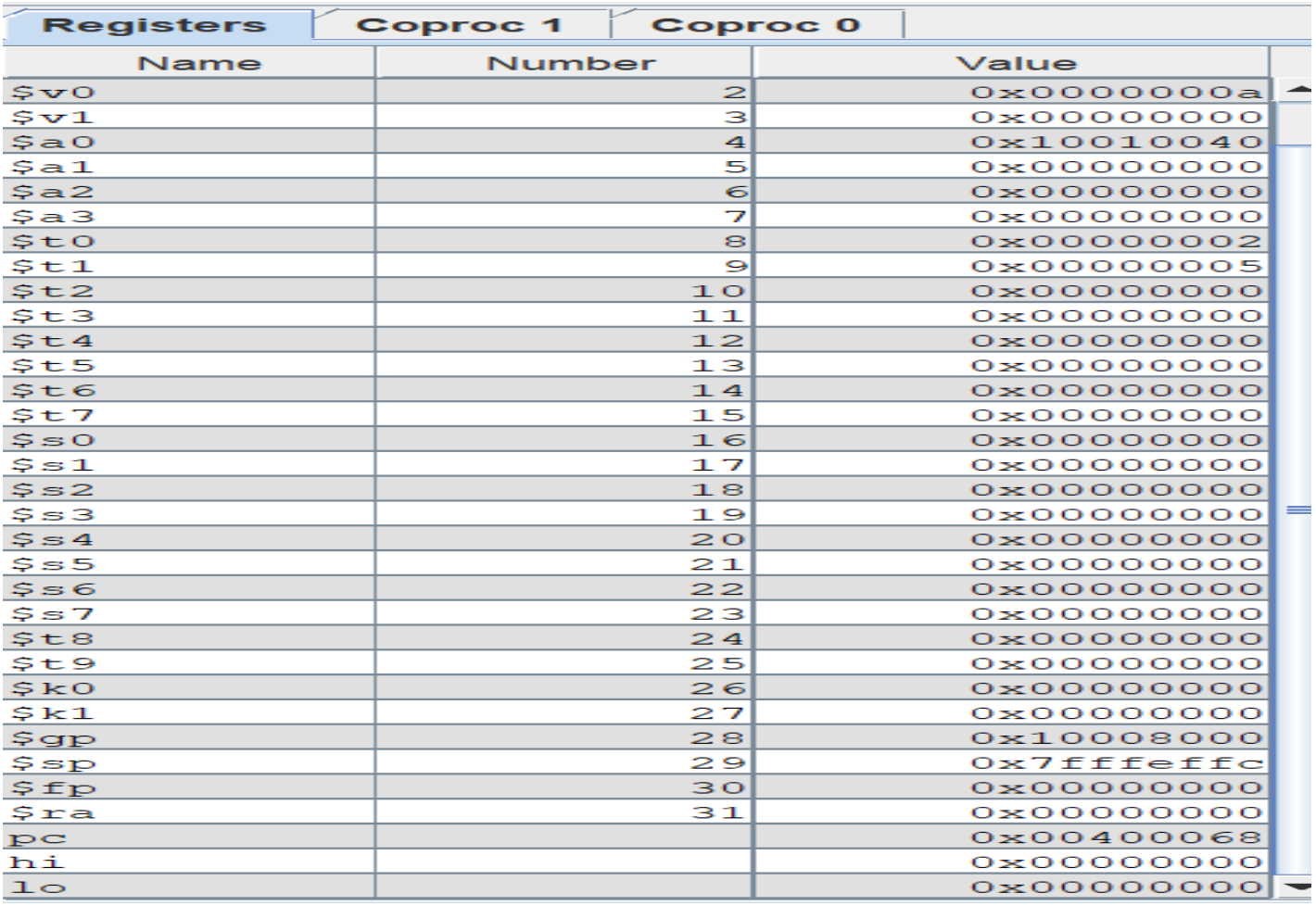
Task no 5: -

“Using bne (branch not equal) to compare equality of two numbers by user ”

```
.data
 myinfo: .asciiz " Muhammad Ali, 19pwcse1801 \n"
  msg1: .asciiz "enter number \n"
 msg2: .asciiz "numbers are equal \n"
 msg3: .asciiz "number are not equal \n"
 .text


     #display name and reg.no
    li $v0 ,4
    la $a0 ,myinfo
    syscall
```

```
#display string
  li $v0 ,4
  la $a0 ,msg1
  syscall

 li $v0 ,5
  syscall
  move  $t0 ,$v0

  li $v0 ,5
  syscall
  move  $t1 ,$v0

  bne $t0 ,$t1 ,label
  li $v0 ,4
  la $a0 ,msg2
  syscall
  b khansab

label:
li $v0 ,4
  la $a0 ,msg3
  syscall
khansab:
 li $v0 ,10
 syscall
```

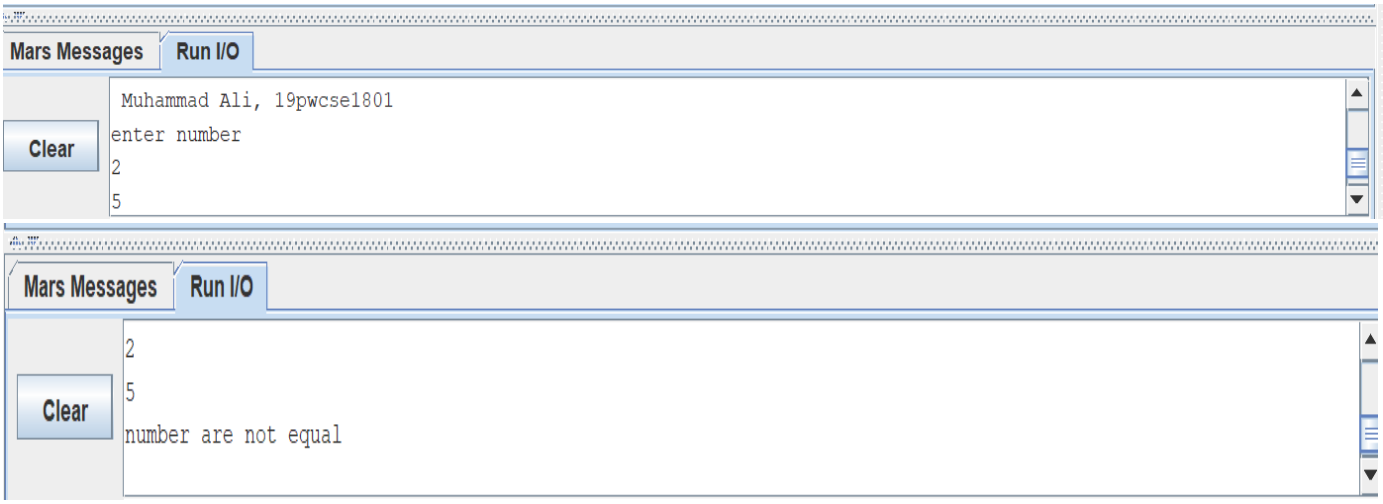
Registers: -



Registers | Coproc 1 | Coproc 0

Name	Number	Value
$v0	2	0x0000000a
$v1	3	0x00000000
$a0	4	0x10010040
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000002
$t1	9	0x00000005
$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	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400068
hi		0x00000000
lo		0x00000000

Consul: -



Task no 6: -

“using slt (set less than) if condition true first register of slt is to 1 else set 0 ”

```
.data
 myinfo: .asciiz " Muhammad Ali, 19pwcse1801 \n"
  msg1: .asciiz "enter number \n"
 msg2: .asciiz "enter another number \n"


.text
     #display name and reg.no
    li $v0 ,4
    la $a0 ,myinfo
    syscall



  #display string
    li $v0 ,4
```

```
la $a0 ,msg1
syscall

li $v0 ,5
syscall
move  $t0 ,$v0


#display string



li $v0 ,4
la $a0 ,msg2
syscall


li $v0 ,5
syscall
move  $t1 ,$v0

slt $t0 ,$t1 ,$t2     #if $t1 is less than $t2, then set $t0 to 1 else to 0
li $v0 ,1
add $a0,$t0,$zero
syscall

li $v0 ,10
syscall
```

Registers: -

Registers | Coproc 1 | Coproc 0

Name	Number	Value
$zero	0	0x00000000
$at	1	0x10010000
$v0	2	0x0000000a
$v1	3	0x00000000
$a0	4	0x00000000
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000000
$t1	9	0x00000003
$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	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400060

Consul: -

Means inter values 4 is not less than 3, so that $t0 is set to 0

Mars Messages | Run I/O

Clear

```
 Muhammad Ali, 19pwcse1801
enter number
4
enter another number
```

Mars Messages | Run I/O

Clear

```
4
enter another number
3
0
```