

Exercise 1:

Run speed at max (no interaction)

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	-65536
\$v0	2	10
\$v1	3	0
\$a0	4	7
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	-65539
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$a0	16	0
\$a1	17	0
\$a2	18	0
\$a3	19	0
\$t4	20	0
\$t5	21	0
\$a6	22	0
\$a7	23	0
\$t8	24	0
\$t9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268468224
\$sp	29	2147479548
\$fp	30	0
\$ra	31	4194320
\$s		4194328
\$h		0
\$lo		0

Line: 8 Column: 14 ☒ Show Line Numbers

Mars Messages Run I/O

Clear

Digital Lab Sim, Version 1.0 (Didier Teffret)

Digital Lab Sim

0.8.

0	1	2	3
4	5	6	7
8	9	a	b
c	d	e	f

Tool Control

Disconnect from MIPS Reset Help Close

Exercise 2:

```
.eqv SEVENSEG_LEFT  0xFFFF0010
.eqv SEVENSEG_RIGHT 0xFFFF0011

.data
input: .asciiz "Input N: "
X: .word 0x3f,0x6,0x5b,0x4f,0x66,0x6d,0x7d,0x7,0xff,0x6f

.align 0
res: .space 80

.text
Nhapso:
#Input N
    la    $a0, input #address of input integer
    li    $v0, 4 #system call for string display
    syscall
    li    $v0, 5 #read interger system call
    syscall
    move  $s0, $v0 #store first integer in s0

Chia:
    #lay hang don vi
    li    $t3, 10
    div   $s0,$t3
    mflo  $s0
    mfhi  $t1 #chu so hang don vi
    #lay hang chuc
    div   $s0,$t3
    mfhi  $t2 #chu so hang chuc
```

main:

#lay dia chi mang X

la \$s1, X

mul \$t5, \$t1, 4

add \$t0, \$s1, \$t5

lw \$a0, 0(\$t0)

jal SHOW_7SEG_LEFT

mul \$t5, \$t2, 4

add \$t0, \$s1, \$t5

lw \$a0, 0(\$t0)

jal SHOW_7SEG_RIGHT

exit: li \$v0, 10

syscall

endmain:

SHOW_7SEG_LEFT: li \$t0, SEVENSEG_LEFT

sb \$a0, 0(\$t0)

jr \$ra

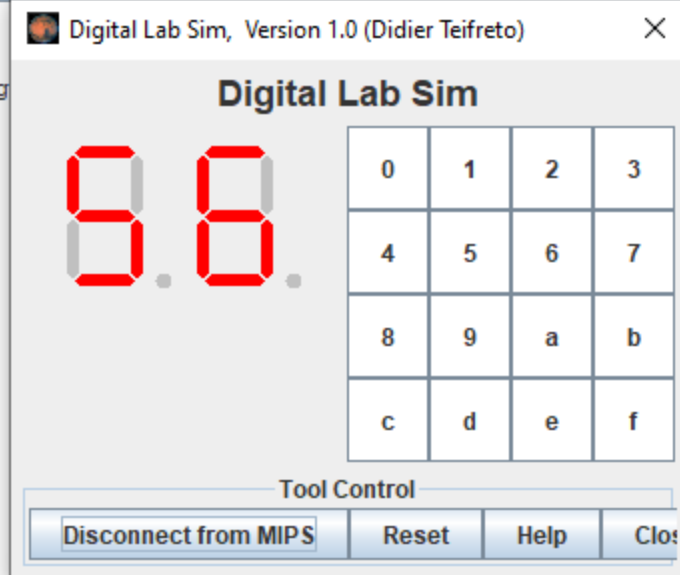
SHOW_7SEG_RIGHT: li \$t0, SEVENSEG_RIGHT

sb \$a0, 0(\$t0)

jr \$ra

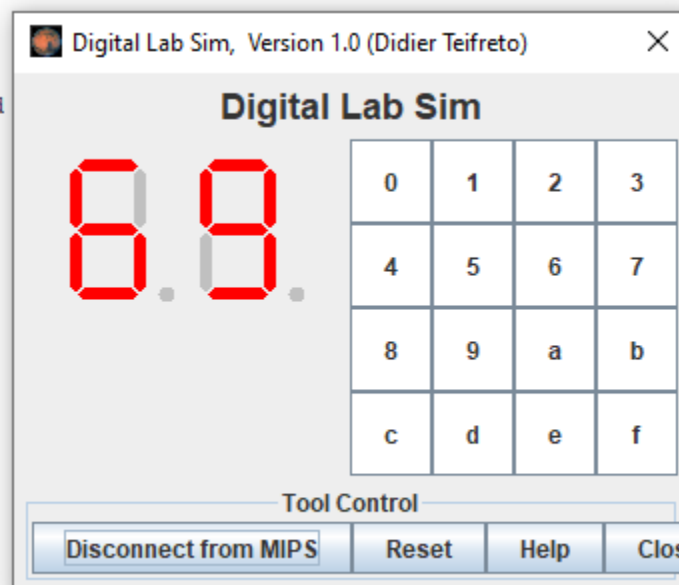
Input N: 156

-- program is finished running



Input N: 1869

-- program is finished



Exercise 3:

```
.eqv SEVENSEG_LEFT 0xFFFF0010
.eqv SEVENSEG_RIGHT 0xFFFF0011

.data
input: .asciiz "Input C: "
print: .asciiz "\nAscii: "

X: .word 0x3f,0x6,0x5b,0x4f,0x66,0x6d,0x7d,0x7,0xff,0x6f

.align 0
res: .space 80

.text
Nhapso:
#Input N
    la    $a0, input #address of input integer
    li    $v0, 4 #system call for string display
    syscall

    li    $v0, 12 #read character system call
    syscall

    move  $a3, $v0
    #chuyen ki tu qua so nguyen

    la    $a0, print #address of input integer
    li    $v0, 4 #system call for string display
    syscall

    li    $v0, 1
    move  $a0, $a3
    syscall
    move  $s0, $a0
```

Chia:

```
#lay hang don vi
li    $t3, 10
div   $s0,$t3
mflo  $s0
mfhi  $t1 #chu so hang don vi

#lay hang chuc
div   $s0,$t3
mfhi  $t2 #chu so hang chuc
```

main:

```
#lay dia chi mang X
la    $s1, X

mul   $t5, $t1, 4
add   $t0, $s1, $t5
lw    $a0, 0($t0)
jal   SHOW_7SEG_LEFT

mul   $t5, $t2, 4
add   $t0, $s1, $t5
lw    $a0, 0($t0)
jal   SHOW_7SEG_RIGHT
```

exit: li \$v0, 10

syscall

endmain:

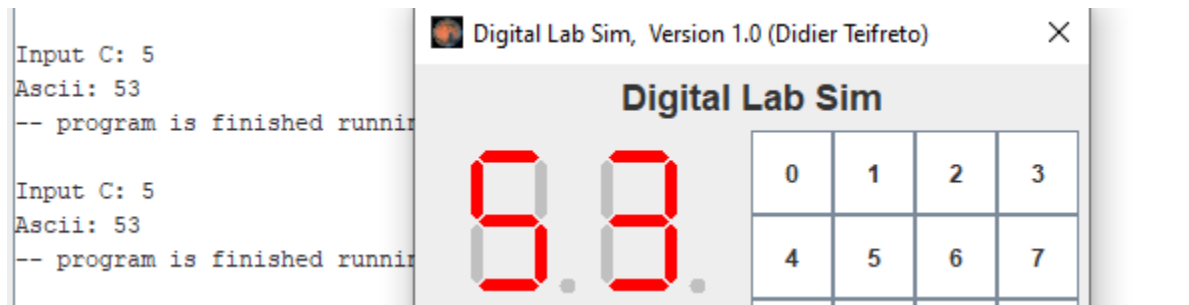
```
SHOW_7SEG_LEFT:    li  $t0, SEVENSEG_LEFT
                   sb  $a0, 0($t0)
```

```
jr $ra
```

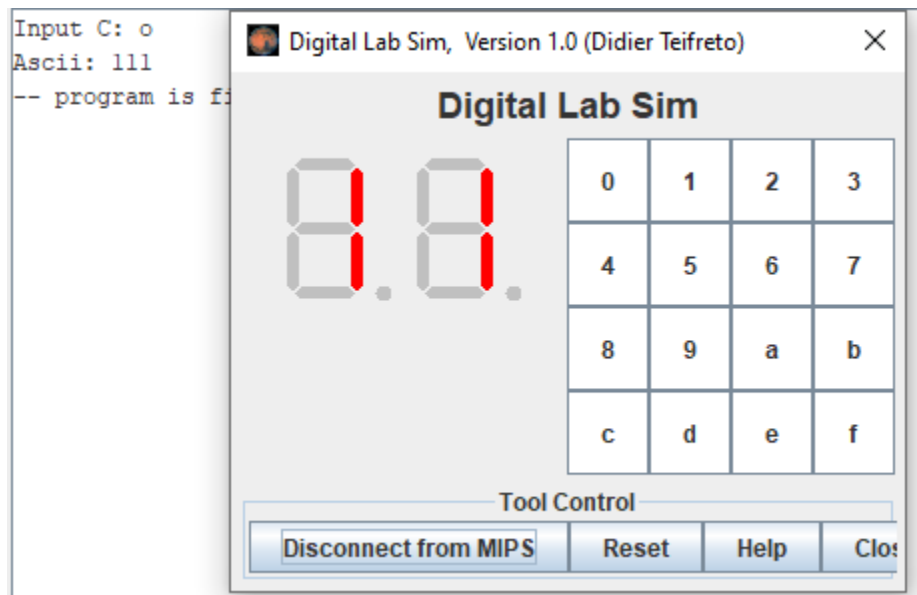
```
SHOW_7SEG_RIGHT: li $t0, SEVENSEG_RIGHT
```

```
sb $a0, 0($t0)
```

```
jr $ra
```



--



Exercise 4:

```
.eqv MONITOR_SCREEN 0x10010000
```

```
.eqv BLUE      0x000000FF
```

```
.eqv WHITE     0x00FFFFFF
```

```
.text
```

```
li $k0, MONITOR_SCREEN
```

```
add $t4,$k0,0
```

```
li $t0,0
```

```
li $t1,0
```

```
li $s1,8
```

```
loop1:
```

```
    beq $t0,$s1,exit
```

```
    addi $t0,$t0,1
```

```
    li $t1,0
```

```
    j loop2
```

```
loop2:
```

```
    beq $t1,$s1,loop1
```

```
    add $t2,$t1,$t0
```

```
    div $t2,$t2,2
```

```
    mfhi $t2
```

```
    beq $t2,$zero,blue
```

```
    j white
```

```
blue:
```

```
    li $t3, BLUE
```

```
    sw $t3, 0($t4)
```

```
    add $t4,$t4,4
```


Exercise 5:

```
.eqv MONITOR_SCREEN 0x10010000
.eqv GREEN 0x0000FF00
.eqv RED 0x00FF0000
.eqv WHITE 0x00FFFFFF
.text
li $k0, MONITOR_SCREEN
add $t1,$k0,$zero
li $t2,64
li $a3,0
li $v0,5
syscall
add $s1,$v0,$zero #x1
li $v0,5
syscall
add $s2,$v0,$zero #y1
li $v0,5
syscall
add $s3,$v0,$zero #x2
li $v0,5
syscall
add $s4,$v0,$zero #y2

add $s5, $s2,$zero #copy y1
mul $t5,$s2,8
```

```
add $t5,$t5,$s1 #Toa do (x1,y1)
mul $t5,$t5,4
add $t5,$t5,$k0
```

```
mul $t4,$s4,8 #Toa do (x2,y2)
add $t4,$t4,$s3
mul $t4,$t4,4
add $t4,$t4,$k0
```

```
## set the theme color
```

```
loop:
```

```
    slt $t3,$a3,$t2
    beq $t3,$zero,rectangle1
    li $t0, WHITE
    sw $t0, 0($t1)
    addi $t1,$t1,4
    addi $a3,$a3,1
    j loop
```

```
#edge
```

```
rectangle1:
```

```
    slt $t3,$t5,$t4
    beq $t3,$zero, newcoords
```

```
mul $t6,$s5,8
add $t6,$t6,$s3 #Toa do (x1,y1)
mul $t6,$t6,4
```

```
add $t6,$t6,$k0
```

```
slt $t0,$t5,$t6
```

```
beq $t0,$zero,newrow
```

```
li $t0, RED
```

```
sw $t0, 0($t5)
```

```
addi $t5,$t5,4
```

```
j rectangle1
```

newrow:

```
addi $s5,$s5,1
```

```
mul $t5,$s5,8
```

```
add $t5,$t5,$s1 #Toa do (x1,y1)
```

```
mul $t5,$t5,4
```

```
add $t5,$t5,$k0
```

```
j rectangle1
```

newcoords:

```
addi $s1,$s1,1
```

```
addi $s2,$s2,1
```

```
addi $s3,$s3,-1
```

```
addi $s4,$s4,-1
```

```
add $s5, $s2,$zero
```

```
mul $t5,$s2,8
```

```
add $t5,$t5,$s1 #Toa do (x1,y1)
```

```
mul $t5,$t5,4
```

```
add $t5,$t5,$k0
```

```
mul $t4,$s4,8 #Toa do (x2,y2)
```

```
add $t4,$t4,$s3
mul $t4,$t4,4
add $t4,$t4,$k0
j rectangle2
```

#backfround

rectangle2:

```
slt $t3,$t5,$t4
beq $t3,$zero, exit
```

```
mul $t6,$s5,8
add $t6,$t6,$s3 #Toa do (x1,y1)
mul $t6,$t6,4
add $t6,$t6,$k0
```

```
slt $t0,$t5,$t6
beq $t0,$zero,newrow2
```

```
li $t0, GREEN
sw $t0, 0($t5)
addi $t5,$t5,4
j rectangle2
```

newrow2:

```
addi $s5,$s5,1
mul $t5,$s5,8
add $t5,$t5,$s1 #Toa do (x1,y1)
mul $t5,$t5,4
add $t5,$t5,$k0
j rectangle2
```

exit:.

