BÀI THỰC HÀNH TUẦN 10
KIẾN TRÚC MÁY TÍNH

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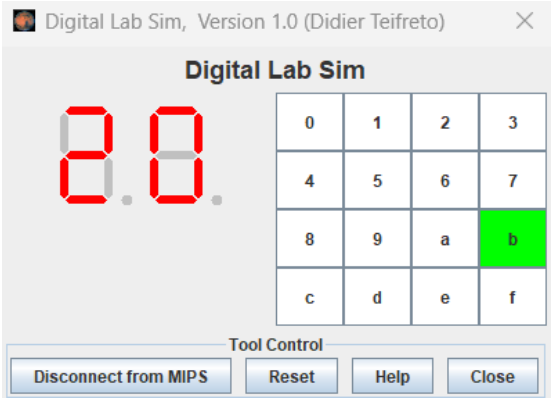
Bài 1:

```
.eqv SEVENSEG_LEFT 0xFFFF0011
.eqv SEVENSEG_RIGHT 0xFFFF0010   phai
.text
main:
      li    $a0, 0x5b        # set value for segments
      jal   SHOW_7SEG_LEFT   # show
      nop
      li    $a0, 0x3F  # set value for segments
      jal   SHOW_7SEG_RIGHT  # show
      nop
exit:
      li $v0, 10
      syscall
endmain:
#---------------------------------------------------------------
-
# Function SHOW_7SEG_LEFT : turn on/off the 7seg
# param[in] $a0 value to shown
# remark $t0 changed
```

```
#-----------------------------------------------------------
-
SHOW_7SEG_LEFT:
      li $t0, SEVENSEG_LEFT      # assign port's address
      sb $a0, 0($t0)         # assign new value
      nop
      jr $ra
      nop
#-----------------------------------------------------------
-
# Function SHOW_7SEG_RIGHT : turn on/off the 7seg
# param[in] $a0 value to shown
# remark $t0 changed
#-----------------------------------------------------------
-
SHOW_7SEG_RIGHT:
      li $t0, SEVENSEG_RIGHT      # assign port's address
      sb $a0, 0($t0)         # assign new value
      nop
      jr $ra
      nop
```

Kết quả:



Bài 2:

```
.eqv SEVENSEG_LEFT 0xFFFF0011    # Dia chi cua den led 7 doan
trai.
                        # Bit 0 = doan a;
                        # Bit 1 = doan b; ...
                        # Bit 7 = dau .
.eqv SEVENSEG_RIGHT 0xFFFF0010   # Dia chi cua den led 7 doan
phai


.data
     mess: .asciiz "Insert the integer: "
.text
main:
     jal   input
     nop
     add   $t1,$0,$v0
     li    $s0,10
     div   $t1,$s0
     mfhi  $t3
     mflo  $t1
     jal   check
     nop
     jal   SHOW_7SEG_RIGHT  # show
     nop
     div   $t1,$s0
     mfhi  $t3
     jal   check
     nop
```

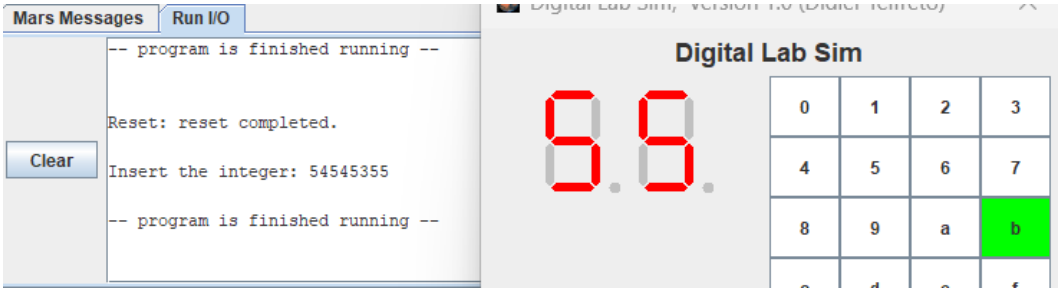
```
      jal   SHOW_7SEG_LEFT   # show
      nop
exit:
      li $v0, 10
      syscall
endmain:
#---------------------------------------------------------------
-
# Function SHOW_7SEG_LEFT : turn on/off the 7seg
# param[in] $a0 value to shown
# remark $t0 changed
#---------------------------------------------------------------
-
SHOW_7SEG_LEFT:
      li $t0, SEVENSEG_LEFT      # assign port's address
      sb $a0, 0($t0)        # assign new value
      nop
      jr $ra
      nop
#---------------------------------------------------------------
-
# Function SHOW_7SEG_RIGHT : turn on/off the 7seg
# param[in] $a0 value to shown
# remark $t0 changed
#---------------------------------------------------------------
-
SHOW_7SEG_RIGHT:
      li $t0, SEVENSEG_RIGHT     # assign port's address
      sb $a0, 0($t0)        # assign new value
```

```
	nop
	jr $ra
	nop
#-------------------------------------------------------------
input:
	li   $v0,4
	la   $a0,mess
	syscall
	li   $v0,5
	syscall
	jr   $ra
#-------------------------------------------------------------
check:
	li   $t2,0
	beq  $t3,$t2,case0
	addi $t2,$t2,1
	beq  $t3,$t2,case1
	addi $t2,$t2,1
	beq  $t3,$t2,case2
	addi $t2,$t2,1
	beq  $t3,$t2,case3
	addi $t2,$t2,1
	beq  $t3,$t2,case4
	addi $t2,$t2,1
	beq  $t3,$t2,case5
	addi $t2,$t2,1
	beq  $t3,$t2,case6
	addi $t2,$t2,1
```

```
    beq   $t3,$t2,case7
    addi  $t2,$t2,1
    beq   $t3,$t2,case8
    addi  $t2,$t2,1
    beq   $t3,$t2,case9
    case0:
          li    $a0,0x3f
          j     out
    case1:
          li    $a0,0x6
          j     out
    case2:
          li    $a0,0x5b
          j     out
    case3:
          li    $a0,0x4f
          j     out
    case4:
          li    $a0,0x66
          j     out
    case5:
          li    $a0,0x6d
          j     out
    case6:
          li    $a0,0x7d
          j     out
    case7:
          li    $a0,0x7
```

```
            j     out
      case8:
            li    $a0,0x7f
            j     out
      case9:
            li    $a0,0x6f
            j     out
      out:
            jr    $ra
```

Kết quả:

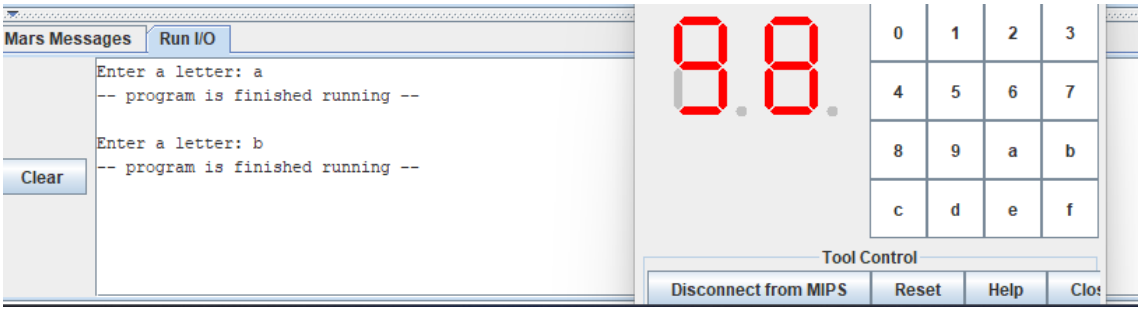


Bài 3:

```
.eqv SEVENSEG_LEFT 0xFFFF0010 # Dia chi cua den led 7 doan trai.

.eqv SEVENSEG_RIGHT 0xFFFF0011 # Dia chi cua den led 7 doan phai


.data

      prompt: .asciiz "Enter a letter: "

      array: .word 0x3f, 0x6, 0x5b, 0x4f, 0x66, 0x6d, 0x79, 0x7, 0x7f, 0x6f

.text

main:

# Display prompt to enter an integer
```

```
    la $s0, array
    li $v0, 4
    la $a0, prompt
    syscall
# Read integer from user
read_letter:
    li $v0, 12
    syscall
    move $s1, $v0
    # Store the input value in $s1
decode:    div $s1, $s1, 10
     mfhi $t1         #Remainder stored in $t1
     sll $t2, $t1, 2
     add $t2, $s0, $t2
     lw $a0, 0($t2)
     add $t3, $t3, 1
     beq $t3, 1, SHOW_7SEG_LEFT
     nop
     beq $t3, 2, SHOW_7SEG_RIGHT
     nop
exit: li $v0, 10
 syscall
endmain:
#---------------------------------------------------------------
-
# Function SHOW_7SEG_LEFT : turn on/off the 7seg
# param[in] $a0 value to shown
# remark $t0 changed
```

```
#---------------------------------------------------------------
-
SHOW_7SEG_LEFT: li $t0, SEVENSEG_LEFT # assign port's address
 sb $a0, 0($t0) # assign new value
 j decode
#---------------------------------------------------------------
-
# Function SHOW_7SEG_RIGHT : turn on/off the 7seg
# param[in] $a0 value to shown
# remark $t0 changed
#---------------------------------------------------------------
-
SHOW_7SEG_RIGHT: li $t0, SEVENSEG_RIGHT # assign port's address
 sb $a0, 0($t0) # assign new value
 j decode
    # Exit the program
    li $v0, 10
    syscall
```



Bài 4:

```
.eqv MONITOR_SCREEN 0x10010000
.eqv WHITE 0x00FFFFFF
.eqv GREEN 0x0000FF00
```

```
.text
li $k0, MONITOR_SCREEN
li $t1, 0    # Counter for rows
draw_chessboard:
    li $t2, 0    # Counter for columns
    inner_loop:
        mul $t3, $t1, 8
        add $t3, $t3, $t2
        sll $t3, $t3, 2
        andi $t4, $t1, 1   # Check if row is even or odd
        andi $t5, $t2, 1   # Check if column is even or odd
        xor $t4, $t4, $t5
        beqz $t4, blanc
        nop
        li $t0, GREEN
        j set_color
     nop
        blanc:
        li $t0, WHITE

        set_color:
        add $s0, $k0, $t3
        sw $t0, 0($s0)
        addi $t2, $t2, 1  # Increment column counter
        slti $t4, $t2, 8  # Check if column < 8
        bnez $t4, inner_loop
     nop
    addi $t1, $t1, 1
```

```
    slti $t4, $t1, 8
    bnez $t4, draw_chessboard
    nop
end:
```