

ĐẠI HỌC BÁCH KHOA HÀ NỘI
TRƯỜNG CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG



BÁO CÁO

Bài tập thực hành tuần 10

Học phần: Thực hành kiến trúc máy tính

Giảng viên hướng dẫn: Lê Bá Vui

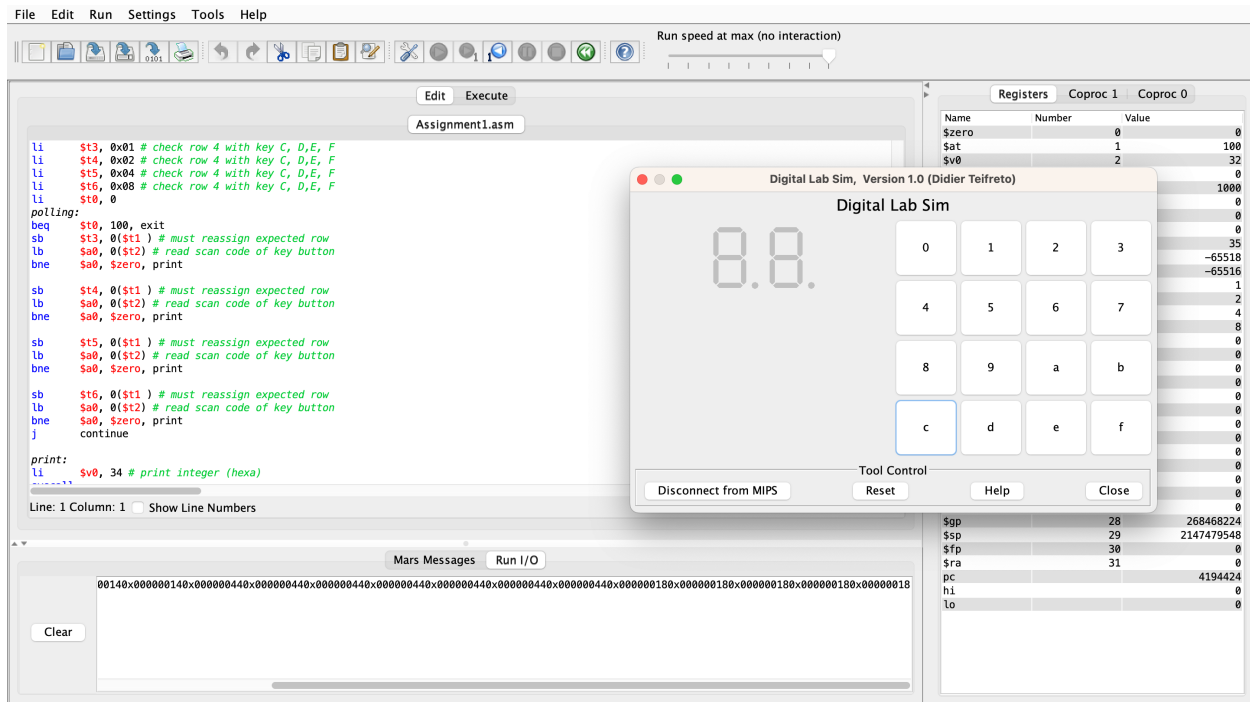
Sinh viên thực hiện: Phạm Huy Cảnh - 20194490

Mã lớp: 130938

Hà Nội, tháng 7 năm 2022

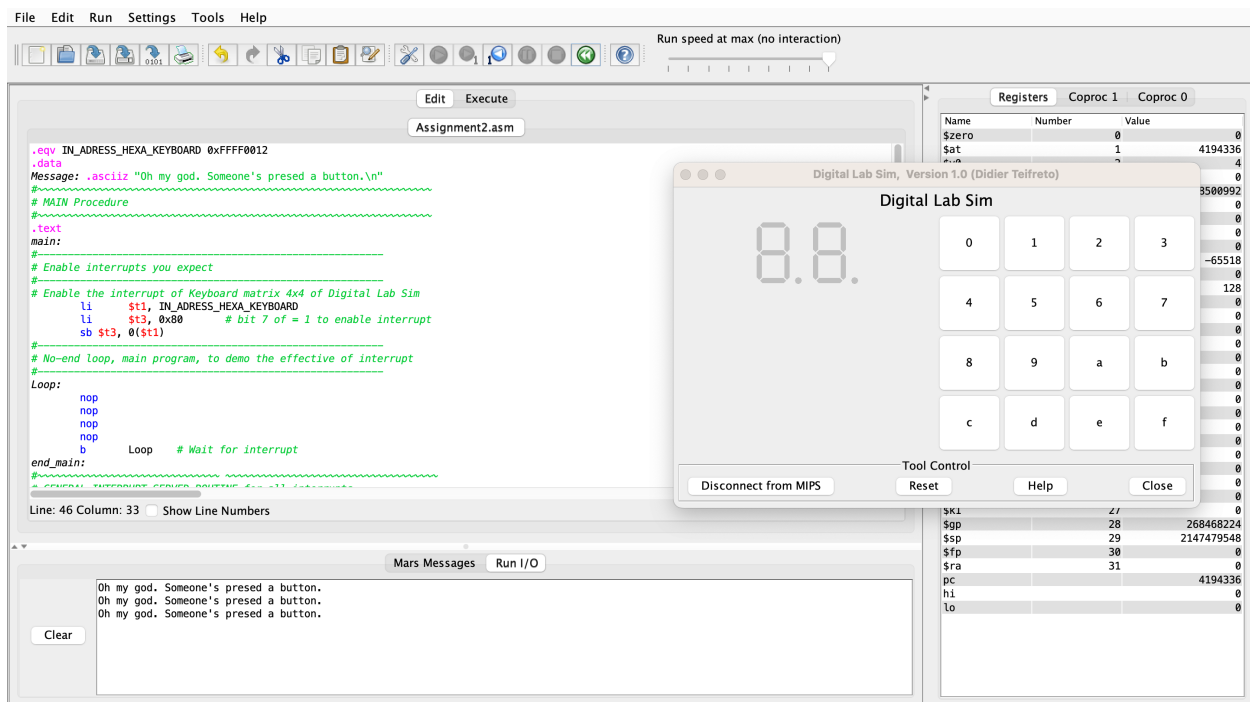
Source code: https://drive.google.com/drive/folders/1--CzINTYO43Wom2RkXfA4TDcAr_bfrmZ?usp=sharing

1. Assignment 1:



Thao tác: Lần lượt bấm 8 → a → c

2. Assignment 2:



3. Assignment 3:

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Assignment3.asm

```
#
next_pc:
mfc0 $at, $14 # $at <= Coproc0.$14 = Coproc0.epc
addi $at, $at, 4 # $at = $at + 4 (next instruction)
mtc0 $at, $14 # Coproc0.$14 = Coproc0.epc <= $at

# RESTORE the REG FILE from STACK
restore:
lw $t3, 0($sp) # Restore the registers from stack
addi $sp, $sp, -4
lw $t1, 0($sp) # Restore the registers from stack
addi $sp, $sp, -4
lw $s0, 0($sp) # Restore the registers from stack
addi $sp, $sp, -4
lw $v0, 0($sp) # Restore the registers from stack
addi $sp, $sp, -4
lw $ra, 0($sp) # Restore the registers from stack
addi $sp, $sp, -4
lw $ra, 0($sp) # Restore the registers from stack
addi $sp, $sp, -4
return:
eret # Return from exception
```

Line: 129 Column: 1 Show Line Numbers

Mars Messages Run I/O

Clear

Key scan code 0x00000024

Key scan code 0x00000044

Digital Lab Sim, Version 1.0 (Didier Teifreito)

Digital Lab Sim

8.8.

0 1 2 3

4 5 6 7

8 9 a b

c d e f

Tool Control

Disconnect from MIPS Reset Help Close

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	4194364
\$v0	2	32
\$v1	3	0
\$a0	4	0
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$a4	8	0
\$a5	9	0
\$a6	10	0
\$a7	11	0
\$s0	12	0
\$s1	13	0
\$s2	14	0
\$s3	15	0
\$s4	16	0
\$s5	17	0
\$s6	18	0
\$s7	19	0
\$t0	20	0
\$t1	21	0
\$t2	22	0
\$t3	23	0
\$t4	24	0
\$t5	25	0
\$t6	26	0
\$t7	27	0
\$fp	28	268468224
\$sp	29	2147479548
\$gp	30	0
\$ra	31	0
\$pc	32	4194364
\$hi	33	0
\$lo	34	0

4. Assignment 4:

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Assignment4.asm

```
la $a0, msg_keypress
syscall
j end_process
Counter_Intr:
li $v0, 4 # Processing Counter Interrupt
la $a0, msg_counter
syscall
j end_process
end_process:
mtc0 $zero, $13 # Must clear cause reg
en_int:
# Re-enable interrupt
#
li $t1, COUNTER
sb $t1, 0($t1)
#
# Evaluate the return address of main routine
# epc <= epc + 4
next_pc:
mfc0 $at, $14 # $at <= Coproc0.$14 = Coproc0.epc
addi $at, $at, 4 # $at = $at + 4 (next instruction)
mtc0 $at, $14 # Coproc0.$14 = Coproc0.epc <= $at
return: eret # Return from exception
```

Line: 90 Column: 37 Show Line Numbers

Mars Messages Run I/O

Clear

Time interval!

Time interval!

Time interval!

Time interval!

Time interval!

Time interval!

Time interval!

Time interval!

Someone has pressed a key!

Digital Lab Sim, Version 1.0 (Didier Teifreito)

Digital Lab Sim

8.8.

0 1 2 3

4 5 6 7

8 9 a b

c d e f

Tool Control

Disconnect from MIPS Reset Help Close

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	4194364
\$v0	2	32
\$v1	3	0
\$a0	4	200
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$a4	8	0
\$a5	9	0
\$a6	10	0
\$a7	11	0
\$s0	12	0
\$s1	13	0
\$s2	14	0
\$s3	15	0
\$s4	16	0
\$s5	17	0
\$s6	18	0
\$s7	19	0
\$t0	20	0
\$t1	21	0
\$t2	22	0
\$t3	23	0
\$t4	24	0
\$t5	25	0
\$t6	26	0
\$t7	27	0
\$fp	28	268468224
\$sp	29	2147479548
\$gp	30	0
\$ra	31	0
\$pc	32	4194356
\$hi	33	0
\$lo	34	0

5. Assignment 5: