This week, please mainly help the students with how to run codes with SPIM.

1. Use any editor to write the source file.
2. Run PCSpim or QtSpim, load the source file.
3. F10 to step through the code.

Please make sure that every student is able to run SPIM.

Then, you may explain to them what a complete MIPS code should be. It has a data segment and a code segment. The beginning of the data segment in the assembly source code is indicated as

.data

and followed by several declarations such as

msg: .asciiz "hello world"

meaning an asciiz string whose starting address is associated with label ``msg.’’ Or

A: .word 0,1,2,3,4,5,6,7,8,9

meaning an array of words whose starting address is associated with label ``A.’’ Or

msg\_empty: .space 400

meaning 400 bytes in the memory whose starting address is associated with label ``msg\_empty.’’

The text segment in the source code usually starts with

.text

.globl main

main:

where ``main’’ is the label associated with the address of the first instruction of the code. And the code usually ends with

li $v0,10 #exit

syscall

You may also explain to them about syscall in SPIM:

la $a0,msg

li $v0,4

syscall

which will print a string on the console of SPIM according to the content starting at ``msg.’’

Then you may help them with the understanding of the following code which is about using the stack to reverse a string. It should be helpful to step through the programs and explain why certain things happen. Of course, you can also add in things you think suitable for the students.

.data

msg: .asciiz "hello world"

endl: .asciiz "\n"

.text

.globl main

main:

addi $sp,$sp,-1

sb $0,($sp)

la $t1, msg

L0:

lb $t0,($t1)

beq $t0,$0, L1

sub $sp,$sp,1

sb $t0,($sp)

add $t1,1

j L0

L1:

la $t1,msg

L2:

lb $t0,($sp)

add $sp,$sp,1

sb $t0,($t1)

beq $t0, $0, L3

add $t1,1

j L2

L3:

la $a0,msg

li $v0,4

syscall

la $a0,endl

li $v0,4

syscall

li $v0,10 #exit

syscall