
Notes:

- The main purpose of this week is to practice about floating point instructions in MIPS.
 - Students compress the assembly files then submit on e-learning.
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Question 1. Given the following program with MIPS assembly.

```
.data
    s_a: .float 1.1
    s_b: .float 2.2

.text
    la $t0, s_a
    lwc1 $f0, 0($t0)
    la $t0, s_b
    lwc1 $f1, 0($t0)
    add.s $f2, $f1, $f0

    li $v0, 10
    syscall
```

Students run the program and answer the following question

1. Explain the function of lwc1, add.s instructions.
2. Can we use lw to load value for \$f0 register? Explain.
3. Is the result that is stored in \$f2 is 3.3 . If it is not, explain.
4. Analyze the value that are stored in \$f0, \$f1, \$f2 based on IEEE 754 standard.

Question 2. Given the following program with MIPS assembly.

```
.data
    d_a: .double 1.1
    d_b: .double 2.2

.text
    la $t0, d_a
    ldc1 $f0, 0($t0)
    la $t0, d_b
    ldc1 $f1, 0($t0)
    add.d $f2, $f1, $f0

    li $v0, 10
    syscall
```

Students run the program and answer the following question

1. List the differences between this program and the program on Question 1.
2. Is the result that is stored in \$f2 is 3.3 . If it is not, explain.
3. Analyze the value that are stored in \$f0, \$f1, \$f2 based on IEEE 754 standard.
4. Correct the program to add 2 double number 1.5 and 2.25

Question 3. Implement a procedure that convert input degree in Fahrenheit to Celsius. If the degree in Celsius higher than 99.5, print "Warning" to terminal, otherwise print "Safe" to terminal.

Common instructions that support real number

Syntax	Effect
Arithmetic	
add.s \$f0, \$f1, \$f2	\$f0 = \$f1 + \$f2
add.d \$f0, \$f2, \$f4	\$f0 = \$f2 + \$f4
sub.s \$f0, \$f1, \$f2	\$f0 = \$f1 - \$f2
mul.s \$f0, \$f1, \$f2	\$f0 = \$f1 * \$f2
div.s \$f0, \$f1, \$f2	\$f0 = \$f1 / \$f2
abs.s \$f0, \$f1	\$f0 = \$f1
neg.s \$f0, \$f1	\$f0 = -\$f1
Memory transfer	
ldc1 \$f0, 8(\$t0)	Load double
swc1 \$f0, 8(\$t0)	Store float
Jump/branch	
c.eq.s \$f2, \$f4	if f2 == f4 then code = 1 else code = 0
c.le.s \$f2, \$f4	if f2 <= f4 then code = 1 else code = 0
c.lt.s \$f2, \$f4	if f2 < f4 then code = 1 else code = 0
bc1f label	if code == 0 then jump to label
bc1t label	if code == 1 then jump to label

—————the end—————