



2008/2

BOA SORTE!

OAC - Turma A
1ª Prova
GABARITO

2008/2

1) a) #coef \$a0 x=\$a0

P2: lw \$t0, 0(\$a0)

lw \$t1, 4(\$a0)

lw \$t2, 8(\$a0)

mul \$v0, \$t0, \$a1 # a.x

add \$v0, \$v0, \$t1 # a.x+b

mul \$v0, \$v0, \$a1 # x.(a.x+b)

add \$v0, \$v0, \$t2 # x(a.x+b)+c

jr \$v0 #retorna em \$v0

b) .data

C0: .float 0.0

constantes na memória

C2: .float 2.0

C4: .float 4.0

.text

BASCARA: # \$a0 = *coef

lwc1 \$f0, 0(\$a0) # a

lwc1 \$f1, 4(\$a0) # b

lwc1 \$f2, 8(\$a0) # c

mul.s \$f4, \$f1, \$f1 # b²

mul.s \$f5, \$f0, \$f2 # a.c

l.s \$f6, C4 # 4

mul.s \$f5, \$f5, \$f6 # 4ac

sub.s \$f4, \$f4, \$f5 # Δ = b² - 4ac

L.S. \$10, C0 #0
 C.Lt.S \$4, \$6 # $\Delta < 0$?
 L.S. \$6, C2 #2
 neg.S \$1, \$1 #-b
 mul.S \$0, \$0, \$6 #2a
 bclt COMPLEX

sqrt.S \$4, \$4 # $\sqrt{\Delta}$
 add.S \$5, \$4 # $-b + \sqrt{\Delta}$
 div.S \$7, \$5, \$0 # $(-b + \sqrt{\Delta}) / 2a$

sub.S \$5, \$1, \$4 # $-b - \sqrt{\Delta}$
 div.S \$8, \$5, \$0 # $(-b - \sqrt{\Delta}) / 2a$

addi \$SP, \$SP, -16 # EMPIRICAL
 L.S. \$1, C0 #0
 swc1 \$7, 0(\$SP) #re1
 swc1 \$1, 4(\$SP) #0
 swc1 \$8, 8(\$SP) #re2
 swc1 \$1, 12(\$SP) #0
 jr \$ra

COMPLEX: div.S \$7, \$1, \$0 # $-b / 2a$
 neg.S \$4, \$4 # -0
 sqrt.S \$4, \$4 # $\sqrt{\Delta}$
 div.S \$8, \$4, \$0 # $\sqrt{\Delta} / 2a$

addi \$SP, \$SP, -16 # EMPIRICAL
 swc1 \$7, 0(\$SP) #re1
 swc1 \$8, 4(\$SP) #im1
 swc1 \$7, 8(\$SP) #re1
 neg.S \$8, \$8 # -im1
 swc1 \$8, 12(\$SP)

jr \$ra

2) a) número entre (0,1) = $2^{-1} \times (1 + 0,xxxx \dots xx)$

IEEE 754 0 0111111110 xxxxx ... xxx

1022 \rightarrow 52 bits

Q63 0,xxxxxx ... xx

63 bits

\rightarrow plain
 \rightarrow significant

logo: para casos binários: $63 - 52 = 11 //$

para casos decimais

$$2^{-52} = 2,22 \times 10^{-16}$$

$$2^{-63} = 1,08 \times 10^{-19}$$

$$19 - 16 = 3 //$$

b) maior negativo: 1 00000001 0000 ... 000

1 \rightarrow 1 = 1.0000

Hexadecimal: 0x80800000 //

$$\text{Decimal: } -2^{1-127} \times 1 = -1,17549435 \times 10^{-38} //$$

menor negativo: 1 11111110 111111 ... 11

254 $\approx 2 \rightarrow$ 1.111111...

Hexadecimal: 0xFFFFFFF //

$$\text{Decimal: } -2^{254-127} \times (\approx 2) = -2^{127} = -3,4028235 \times 10^{38} //$$

$$c) \frac{2,75 + (-5,3125005)}{1 + (-1)} = \frac{-2,5625005}{0} = -\infty //$$

em Hexadecimal: 1 11111111 000000 ... 0000

0xFFFF0000 //

3) a) $habs \$t0, \$t1 \rightarrow$ $sra \$at, \$t1, 31 \rightarrow \begin{cases} 0000 \dots 00 > 0 \\ 1111 \dots 11 < 0 \end{cases}$

$xor \$t0, \$at, \$t1 \rightarrow \begin{cases} \overline{im} > 0 \\ im < 0 \end{cases}$

$subu \$t0, \$at, \$t0 \rightarrow \begin{cases} 0 - \overline{im} \rightarrow 70 \\ -1 - im \rightarrow 60 \end{cases}$

b) $\text{bgtu } \$t0, \text{small}, \text{LABEL} \rightarrow$

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lui $at, 0
ori $at, $at, small
sltu $at, $at, $t0
bne $at, $zero, LABEL

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c) $\text{Ld } \$f0, \text{LABEL} \rightarrow$

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lui $at, LABEL-16
ori $at, $at, LABEL-0
ldc1 $f0, 0($at)

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d) $\text{seq } \$t0, \$t1, \$t2 \rightarrow$

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subu $t0, $t1, $t2
ori $at, $zero, 1
slt $at, $t1, $t2
slu $t0, $t2, $t1
xor $t0, $t0, $at

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4)

a) Máquina Base B

	A	B	C
P1	0,4	1	2
P2	1	1	1
P3	4	1	0,3
Média geométrica	1,169	1	0,843

Logo C tem a engrenagem a em + rápido //

b) workload p/c

$$WP1 = \frac{K_0}{(K_0 + K_2 + \frac{1}{15})} = 0,4615 \rightarrow 46,15\%$$

$$WP2 = \frac{K_0}{(K_0 + K_2 + \frac{1}{15})} = 0,2307 \rightarrow 23,07\%$$

$$WP3 = \frac{K_5}{(\frac{1}{10} + K_2 + \frac{1}{15})} = 0,3076 \rightarrow 30,76\%$$

5) Porque geralmente as instâncias em porta FLUTUANTE possuem capacidade de processamento mais homogêneas,