

Lista 2

- 1)     addi \$s0, \$0, 10  
        addi \$s1, \$0, -1  
        addi \$s0, \$s0, 1  
        addi \$s2, \$s0, \$s1
  
- 2)     addi \$s0, \$0, 3  
        sll \$s1, \$s0, 2
  
- 3)     addi \$s0, \$0, 3  
        sll \$s1, \$s0, 10  
        add \$s1, \$s1, \$s0
  
- 4)     addi \$s0,\$s0,3  
        sra \$s1,\$s0,2
  
- 5)     addi \$s0, \$0, 0x1234  
        sll \$s0, \$s0, 16  
        ori \$s0, \$s0, 0x5678
  
- 6)     addi \$s0,\$0,-1  
        addi \$t0,\$0,32  
        div \$s0,\$t0  
        mflo \$s1
  
- 7)     addi \$t0, \$0, 0x1001  
        sll \$t0, \$t0, 16  
        lw \$s0, 32(\$t0)  
        addi \$s1, \$0, 10

```
add $t1, $s1, $s0
sw $t1, 64($t0)
```

```
8)   addi $t0, $zero, 0x1001
      sll $t0, $t0, 16
      lw $s0, 0($t0)
      ori $s1, $s1, 10
      add $s2, $s1, $s0
```

```
9)   addi $t0, $0, 0x1001
      sll $t0, $t0, 16
      ori $t0, $t0, 0x????
      ori $t1, $t0, 0x0002
      lw $s1, 0($t0)
      addi $s0, $0, 5
      add $t2, $s0, $s1
      sw $t2, 0($t1)
```

```
10)  addi $t0, $zero, 0x1001
      sll $t0, $t0, 16
      ori $t0, $t0, 0x????
      lw $s0, 0($t0)
      lw $s1, 4($t0)
      sw $s1, 0($t0)
      sw $s0, 4($t0)
```

```
ori $s0, $zero, 0
ori $s1, $zero, 10
do:
    addi $s0, $s0, 1
    bne $s0, $s1, do
```

```
12)  addi $t0, $0, 0x1001
      sll $t0, $t0, 16
      lw $s0, 0($t0)
      slt $t1, $s0, $0
      bne $t1, $0, neg
      j fim
      neg:
      sub $s0, $0, $s0
      fim:
      sw $s0, 0($t0)
```

```
13)  .text
      .globl main
      main:
      addi $t0, $0, 0x1001
      sll $t0, $t0, 16
      lw $s0, 0($t0)
      ori $t3, $0, 50
      slt $t1, $t3, $s0
      bne $t1, $0, fim
      slti $t1, $s0, 30
      bne $t1, $0, fim
      ori $s1, $0, 1
      fim:
          sw $s1, 4($t0)
      .data
      TEMP: .word 30
      FLAG: .word -1
```

```
14)  .text
      .globl main
```

```

main:
addi $t0, $0, 0x1001
sll $t0, $t0, 16
add $t2, $t0, 12
do:
    ori $t4, $0, 0
    add $t3, $t0, $0
loop:
    lw $s1, 0($t3)
    lw $s2, 4($t3)
    slt $t1, $s2, $s1
    beq $t1,$0,increment
    ori $t4, $0, 1
    sw $s1, 4($t3)
    sw $s2, 0($t3)
increment:
    addi $t3, $t3, 4
    bne $t3,$t2,loop
    bne $t4, $0, do
.data
x0: .word 5
x1: .word 3
x2: .word 2
x3: .word 4

```

```

15) .text
    .globl main
main:
    lui $t0, 0x1001
    lw $s0, 0($t0)

```

andi \$t1, \$s0, 1

add \$a0, \$s0, \$0

bne \$t1, \$0, impar

par:

addi \$a1, \$0, 3

jal exp

add \$s1, \$0, \$v0

add \$a0, \$s0, \$0

addi \$a1, \$0, 2

jal exp

add \$s1, \$s1, \$v0

add \$a0, \$s0, \$0

addi \$a1, \$0, 1

jal exp

sll \$t2, \$v0, 1

sub \$s1, \$s1, \$t2

j fim

impar:

addi \$a1, \$0, 4

jal exp

add \$s1, \$0, \$v0

add \$a0, \$s0, \$0

```
addi $a1, $0, 2
jal exp
sub $s1, $s1, $v0
addi $s1, $s1, 1
```

```
j fim
exp:
add $t2,$0,$a0
loop:
beq $a1, $0, expfim
mult $t2,$a0
mflo $t2
addi $a1, $a1, -1
j loop
expfim:
add $v0, $0, $t2
jr $ra
```

```
fim:
sw $s1, 4($t0)
```

```
.data
x: .word 3
```

```
16) .text
.globl main
```

main:

lui \$t0, 0x1001

lw \$s0, 0(\$t0)

add \$a0, \$0, \$s0

slt \$t1, \$0, \$s0

beq \$t1, \$0, menorIgual

addi \$a1, \$0, 2

jal exp

addi \$s1, \$v0, 1

j fim

menorIgual:

addi \$a1, \$0, 3

jal exp

addi \$s1, \$v0, -1

j fim

exp:

add \$t2,\$0,\$a0

loop:

beq \$a1, \$0, expfim

mult \$t2,\$a0

mflo \$t2

addi \$a1, \$a1, -1

```
j loop
expfim:
add $v0, $0, $t2
jr $ra
```

```
fim:
sw $s1, 4($t0)
```

```
.data
x: .word -1
```

```
17) .text
.globl main
main:
lui $t0, 0x1001
lw $s0, 0($t0)
lw $s1, 4($t0)

ori $t2, $0, 98
loop:
add $t1, $s0, $s1
sw $t1, 8($t0)
lw $s0, 4($t0)
add $s1, $0, $t1
addi $t0, $t0, 4
addi $t2, $t2, -1
beq $t2, $0, fim
j loop
fim:
```



```
.data  
a0: .word 0  
a1: .word 1
```

```
18) .text  
    .globl main  
    main:  
    lui $t0, 0x1001  
    lw $s0, 0($t0)  
  
    addi $s1,$0,0  
  
    ori $t1,$0,50  
    ori $t2,$0,100  
    ori $t4,$0,150  
    ori $t5,$0,200  
  
    slt $t3,$s0,$t1  
    bne $t3,$0,fim  
    slt $t3,$t5,$s0  
    bne $t3,$0,fim  
    slt $t3,$t2,$s0  
    slt $t6,$s0,$t4  
    xor $t3, $t3,$t6  
    beq $t3, $0, fim  
    addi $s1,$0,1  
    fim:
```

.data

a0: .word 201

19) .text

.globl main

main:

addi \$t0, \$0, 0x1001

sll \$t0, \$t0, 16

bubbleSort:

add \$t2, \$t0, 8

do:

ori \$t4, \$0, 0

add \$t3, \$t0, \$0

loop:

lw \$s1, 0(\$t3)

lw \$s2, 4(\$t3)

slt \$t1, \$s2, \$s1

beq \$t1,\$0,increment

ori \$t4, \$0, 1

sw \$s1, 4(\$t3)

sw \$s2, 0(\$t3)

increment:

addi \$t3, \$t3, 4

bne \$t3,\$t2,loop

bne \$t4, \$0, do

```
lw $s1, 4($t0)
sw $s1, 12($t0)
```

```
.data
```

```
A: .word 23
```

```
B: .word 98
```

```
C: .word 17
```

```
20) .text
    .globl main
    main:
    addi $t0, $0, 0x1001
    sll $t0, $t0, 16
    lw $s0, 0($t0)
    loop:
    sll $t1, $t2, 1
    addi $t1, $t1, 1
    sw $t1, 0($t0)
    add $s1,$s1,$t1
    addi $t2, $t2, 1
    addi $t0, $t0, 4
    bne $t2,100,loop
    sw $s1, 0($t0)
```

ULA:  $2 + 5n \rightarrow 502$

Desvio:  $1n \rightarrow 100$

Mem.:  $2 + 1n \rightarrow 102$

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n -> 100

$CPI_m = (502 \cdot 3 + 100 \cdot 4 + 102 \cdot 5) / 704 = 3,4318$

$CPU_{time} = 704 \cdot 3,4318 \cdot 10 = 24159,872 \text{ ns} = 24,159872 \text{ ms}$

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Versão Pior

.text

.globl main

main:

addi \$t0, \$0, 0x1001

sll \$t0, \$t0, 16

lw \$s0, 0(\$t0)

loop:

sll \$t1, \$t2, 1

addi \$t1, \$t1, 1

sw \$t1, 0(\$t0)

add \$s1,\$s1,\$t1

addi \$t2, \$t2, 1

addi \$t0, \$t0, 2

addi \$t0, \$t0, 2

bne \$t2,100,loop

sw \$s1, 0(\$t0)

ULA:  $2 + 6n \rightarrow 602$

Desvio:  $1n \rightarrow 100$

Mem.:  $2 + 1n \rightarrow 102$

-----

804

n -> 100

$$CPI_m = (602 \cdot 3 + 100 \cdot 4 + 102 \cdot 5) / 804 = 3,3781$$

$$CPU_{time} = 804 \cdot 3,3781 \cdot 10 = 27159,924 \text{ ns} = 27,159924 \text{ ms}$$

$$Sup = 27,159924 / 24,159872 = 1,124$$

21)    `addi $S3, $S2, 396`

`LOOP:`

`lw $S1, 0($S2)`

`addi $S1, $S1, 1`

`sw $S1, 0 ($S2)`

`addi $s2, $s2, 4`

`sub $S4, $S3, $S2`

`bne $S4, $zero, LOOP`

$$ULA : 1 + 3n = 298$$

$$\text{Desvio: } 1n = 99$$

$$\text{Mem: } 2n = 198$$

$$\text{Total: } 595$$

$$n : 396 / 4 = 99$$

$$CPI_m = (298 \cdot 3 + 99 \cdot 4 + 198 \cdot 5) / 595 = 3,8319$$

$$CPU_{Time} = 595 \cdot 3,8319 \cdot 10 = 22799,805 \text{ ns} = 22,799805 \text{ ms}$$

22)    `lui $a0, 0x1001`

`addi $a1, $0, 10`

`jal somaVetor`

`nop`

syscall

somaVetor:

addi \$t0, \$0, 0

addi \$t1, \$0, 0

loop: beq \$t0, \$a1, fim

andi \$t2, \$t0, 1

bne \$t2, \$0, else

sll \$t2, \$t0, 1

addi \$t2, \$t2, -1

j inc

else:

add \$t2, \$0, \$t0

inc:

sw \$t2, 0(\$a0)

addi \$a0, \$a0, 4

addi \$t0, \$t0, 1

j loop

fim:

add \$v0, \$0, \$t1

jr \$ra

23) .text

.globl main

main:

lui \$t0, 0x1001

lw \$a0, 0(\$t0)

lw \$a1, 4(\$t0)

```
jal exp
sw $v0, 8($t0)
syscall
exp:
addi $t1, $0, 1
add $t2,$0,$a0
loop:
mult $t2,$a0
mflo $t2
addi $a1, $a1, -1
bne $a1, $t1, loop
add $v0, $0, $t2
jr $ra
```

```
.data
x: .word 4
y: .word 2
```