

Tutoraggio 7

Calcolatori Elettronici

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Calling conventions

<i>Preservato</i>	<i>Non preservato</i>
Registri saved: \$s0-\$s7	Registri temporanei: \$t0-\$t9
Registro stack pointer: \$sp	Registri argomento: \$a0-\$a3
Registro return address: \$ra	Registri di ritorno: \$v0-\$v1
Stack sopra lo stack pointer	Stack sotto lo stack pointer

Frammento 1

```
f:
    add $v0, $zero, $zero
loop:
    slti $t0, $a0, 1
    bne $t0, $zero, exit
    add $v0, $v0, $a0
    addi $a0, $a0, -1
    j loop
exit:
    jr $ra
```

Cosa fa questa procedura? E' corretta?

Frammento 1 (2)

```
f:
    add $v0, $zero, $zero    # sum = 0
loop:
    slti $t0, $a0, 1         # $t0 = (n < 1)
    bne $t0, $zero, exit     # if (n < 1) goto exit
    add $v0, $v0, $a0         # sum += n
    addi $a0, $a0, -1         # n--
    j loop
exit:
    jr $ra                   # return sum
```

Frammento 1 (3)

```
f:  add $v0, $zero, $zero    # sum = 0
    slti $t0, $a0, 1        # $t0 = (n < 1)
    bne $t0, $zero, exit    # if (n < 1) goto exit

    addi $sp, $sp, -8
    sw $ra, 0($sp)
    sw $s0, 4($sp)
    add $s0, $zero, $a0      # $s0 = n
    addi $a0, $a0, -1
    jal f                    # f(n-1)
    add $v0, $s0, $v0        # sum = n + f(n-1)

    lw $ra, 0($sp)
    lw $s0, 4($sp)
    addi $sp, $sp, 8
exit:
    jr $ra                  # return sum
```

Frammento 1 (4)

```
f:  add $v0, $zero, $zero    # sum = 0
    slti $t0, $a0, 1        # $t0 = (n < 1)
    bne $t0, $zero, exit    # if (n < 1) goto exit

    add $t0, $a0, $zero     # $t0 = n
    addi $sp, $sp, -8
    sw $ra, 0($sp)
    sw $t0, 4($sp)
    addi $a0, $a0, -1
    jal f                   # f(n-1)
    lw $t0, 4($sp)          # recupera n dallo stack
    add $v0, $t0, $v0        # sum = n + f(n-1)

    lw $ra, 0($sp)
    addi $sp, $sp, 8
exit:
    jr $ra                  # return sum
```

Frammento 2

incrementa:

```
lw $t0, 0($s0)
addi $t0, $t0, 1
sw $t0, 0($s0)
jr $ra
```

Cosa fa questa procedura? E' corretta?

Frammento 3

```
proc:
    addi $sp, $sp, -4
    sw $ra, 0($sp)

    add $t0, $a0, $zero

    srl $a0, $a0, 1
    jal radice_quadrata

    add $v0, $v0, $t0

    lw $ra, 0($sp)
    addi $sp, $sp, 4
    jr $ra
```

Cosa fa questa procedura? E' corretta?

Frammento 4

proc:

```
addi $sp, $sp, -4  
sw $ra, 0($sp)
```

```
add $t0, $a0, $zero  
sll $t1, $t0, 1  
add $t1, $t0, $t1  
add $a0, $t1, $a1
```

```
jal radice_quadrata  
addi $v0, $v0, 1
```

```
lw $ra, 0($sp)  
addi $sp, $sp, 4  
jr $ra
```

Cosa fa questa procedura? E' corretta?

Frammento 5

```
addi $sp, $sp, -8
sw $ra, 0($sp)
sw $s0, 4($sp)
```

```
add $s0, $a0, $zero
sll $a0, $a0, 1
jal radice_quadrata
add $a0, $s0, $zero
lw $s0, 4($sp)
addi $sp, $sp, 4
```

```
sll $t0, $v0, 2
add $v0, $a0, $t0
```

```
lw $ra, 0($sp)
addi $sp, $sp, 4
jr $ra
```