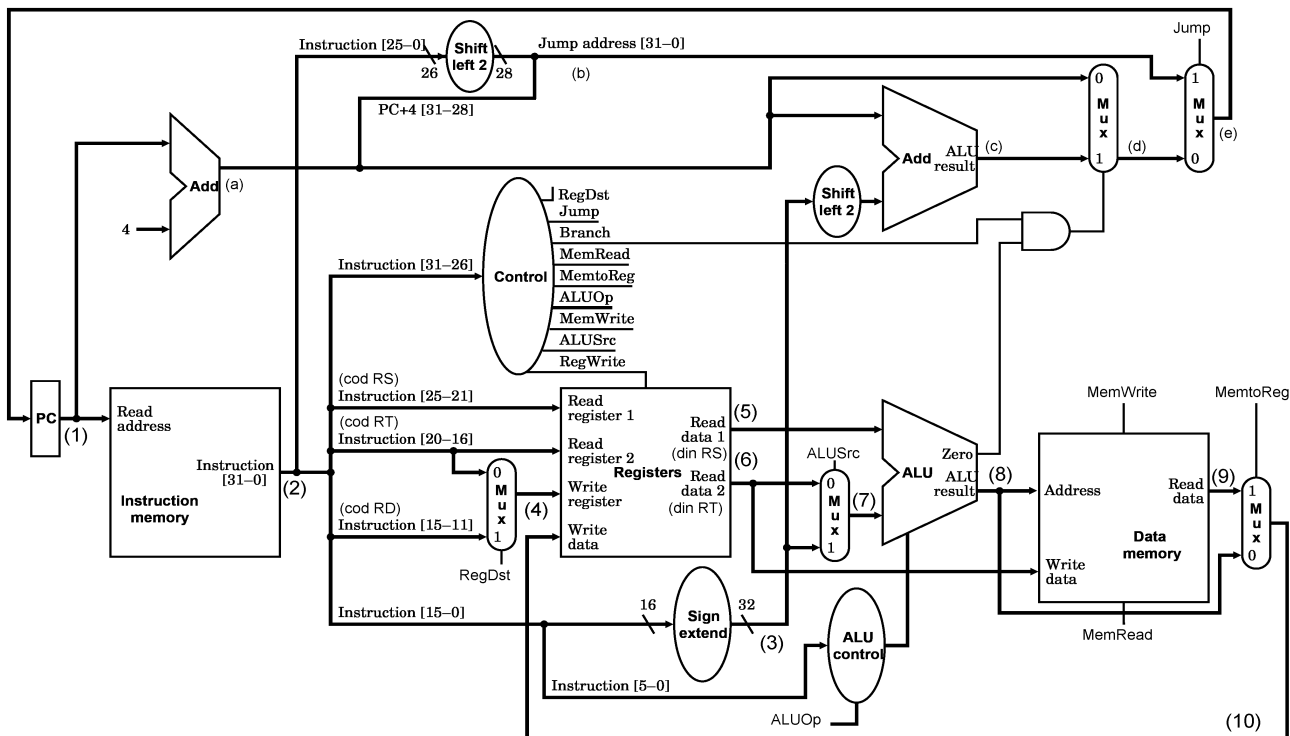



O prima implementare (slide 7.51)



Control (nu contine coloana Jump) (slide 7.41)

| | Instruction | RegDst | ALUSrc | Memto-Reg | Reg Write | Mem Read | Mem Write | Branch | ALUOp1 | ALUp0 |
|------|-------------|--------|--------|-----------|-----------|----------|-----------|--------|--------|-------|
| 0x0 | R-format | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 0x23 | lw | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 0x2b | sw | X | 1 | X | 0 | 0 | 1 | 0 | 0 | 0 |
| 0x4 | beq | X | 0 | X | 0 | 0 | 0 | 1 | 0 | 1 |

ALU Control (slide 7.36)

| | | ALUOp | | Camp functie | | | | | | Operatie | |
|------------------------------------------------|-------------------------------------------------------------------------------------|--------------------|--------------------|--------------|----|----|----|----|----|----------|-------|
| | | ALUOp ₁ | ALUOp ₀ | F5 | F4 | F3 | F2 | F1 | F0 | | |
| lw/sw beq add sub and or slt |  | 0 | 0 | X | X | X | X | X | X | 010 | (+) |
| | | X | 1 | X | X | X | X | X | X | 110 | (-) |
| | | 1 | X | X | X | 0 | 0 | 0 | 0 | 010 | (+) |
| | | 1 | X | X | X | 0 | 0 | 1 | 0 | 110 | (-) |
| | | 1 | X | X | X | 0 | 1 | 0 | 0 | 000 | (and) |
| | | 1 | X | X | X | 0 | 1 | 0 | 1 | 001 | (or) |
| | | 1 | X | X | X | 1 | 0 | 1 | 0 | 111 | (slt) |
| | | R-format | | | | | | | | | |

ALU Operation (slide 7.34)

| ALU control input | Function |
|-------------------|------------------|
| 000 | and |
| 001 | or |
| 010 | add |
| 110 | subtract |
| 111 | set on less than |

```
add/sub rd,rs,rt # rd := rs+/-rt
# | 0 | rs | rt | rd | 0 | 0x20/0x22 |
# -----
# 31-26 25-21 20-16 15-11 10-6 5-----0
# 6 b 5 b 5 b 5 b 5 b 6 b
```

```
beq rs,rt,et
# if rs=rt then goto et
# if rs=rt then PC:=PC+4+imm*4 else PC:=PC+4
# | 0x4 | rs | rt | imm=(et-PC-4)/4 |
# -----
# 31-26 25-21 20-16 15-----0
# 6 b 5 b 5 b 16 b
```

```
j et
# goto et
# PC:=PC & 0xf0000000 + imm*4
# | 0x2 | imm |
# -----
# 31-26 25-----0
```

Registri: \$t0 (8) - \$t7 (15)

```
lw/sw rt,imm(rs) # rt :=/= mem[(rs)+imm]
# | 0x23/0x2b | rs | rt | imm |
# -----
# 31-----26 25-21 20-16 15---0
# 6 b 5 b 5 b 16 b
```

```
# x=2*y
.data
x: .space 4
y: .word 10
.text
main:
la $t0,x
lw $t1,4($t0) #
add $t2,$t1,$t1 #
sw $t2,0($t0) #
li $v0,10
syscall
```