Control FSM Diagram

Start

Instruction fetch

Instruction decode/ register fetch

Instruction decode/ register fetch

ALUSrcA = 0
ALUSrcB = 11
ALUOp = 00

MemRead
ALUSrcA = 0
IorD = 0
IPWrite
ALUSrcB = 01
ALUOp = 00
PCWrite
PCSource = 00

Execution
ALUSrcA = 1
ALUSrcB = 10
ALUOp = 00

Memory access

ALUSrcA = 0
ALUSrcB = 11
ALUOp = 00

Jump completion

RegDst = 1
RegWrite
MemToReg = 0

RegDst = 0
RegWrite
MemToReg = 1

Write-back step

MemRead
IorD = 1

MemWrite
IorD = 1

R-type completion

(Op = LW) or (Op = SW)

(Op = R-type)

MemRead
IorD = 0
IRWrite

ALUSrcA = 0
ALUSrcB = 00
ALUOp = 01
PCWriteCond
PCSource = 01

R-type completion

(Op = 'BEQ')

(Op = 'J')

(Op = 'SW')

(Op = 'LW')

4