

CS270 Register Transfer Notation

Name _____

AND R5, R2, #-2

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
Reg[5] <- Reg[2] & Sext(IR[4:0]); CC <- Sign(Reg[2] & Sext(IR[4:0]))

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.REG, DR, GateALU, ALUK = &, SR1, SR2MUX, LD.CC

BRnp SubR

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
PC <- PC + ((CC == N || CC == P) ? Sext(IR[8:0]) : 0)

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.PC, PCMUX, ADDR1MUX, ADDR2MUX

LEA R1, Var

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
Reg[1] <- PC + Sext(IR[8:0]); CC <- Sign(PC + Sext(IR[8:0]))

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.REG, DR, GateMARMUX, MARMUX, ADDR1MUX, ADDR2MUX, LD.CC

STI R4, Dest

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
MAR <- PC + Sext(IR[8:0])
MDR <- Mem[MAR]
MAR <- MDR
MDR <- Reg[4] + 0
Mem[MAR] <- MDR

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.MAR, GateMARMUX, MARMUX, ADDR1MUX, ADDR2MUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.MAR, GateMDR
LD.MDR, MIO.EN, GateMARMUX, MARMUX, ADDR1MUX, SR, ADDR2MUX
MEM.EN, MEM.RW

AND R3, R1, R4

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
Reg[3] <- Reg[1] & Reg[4]; CC <- Sign(Reg[1] & Reg[4])

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.REG, DR, GateALU, ALUK, SR2MUX, SR2, SR1, LD.CC

LDR R2, R1, #3

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
MAR <- Reg[1] + Sext(IR[5:0])
MDR <- Mem[MAR]
Reg[2] <- MDR; CC <- Sign(MDR)

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.MAR, GateMARMUX, MARMUX, ADDR2MUX, ADDR1MUX, SR1
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.REG, DR, GateMDR, LD.CC

JMP R7

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
PC <- Reg[7]

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.PC, PCMUX, ADDR2MUX, ADDR1MUX, SR1

TRAP

MAR <- PC; PC <- PC + 1
MDR <- Mem[MAR]
IR <- MDR
MAR <- Zext(IR[7:0])
MDR <- Mem[MAR]; Reg[7] <- PC
PC <- MDR

LD.MAR, GatePC, LD.PC, PCMUX
LD.MDR, MIO.EN, MEM.EN, MEM.RW
LD.IR, GateMDR
LD.MAR, GateMARMUX, MARMUX
LD.MDR, MIO.EN, MEM.EN, LD.REG, DR, GatePC
LD.PC, PCMUX, GateMDR