

## 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, MDR.SEL, MEM.EN  
# LD.IR, GATEMDR  
# LD.REG, DR = 5, GATEALU, ALUK = &, SR1 = 2, 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, MDR.SEL, MEM.EN  
# 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, MDR.SEL, MEM.EN  
# LD.IR, GATEMDR  
# LD.REG, DR = 1, GATEARMUX, 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, MDR.SEL, MEM.EN  
# LD.IR, GATEMDR  
# LD.MAR, GATEARMUX, MARMUX, ADDR1MUX, ADDR2MUX  
# LD.MDR, MDR.SEL, MEM.EN  
# LD.MAR, GATEMDR  
# LD.MDR, MDR.SEL, GATEARMUX, MARMUX, ADDR1MUX, SR = 4, ADDR2MUX  
# MEM.EN, MEM.RW

### AND R3, R1, R4

### LD R2, R1, #3

### JMP R7

### TRAP