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Lab 6: Transformation Table

Fetch

Instructions	Fetch
halt	icode:ifun ← M1[PC] valP ← PC + 1
nop	icode:ifun ← M1[PC] valP ← PC + 1
rrmovq rA, rB	icode:ifun ← M1[PC] rA:rB ← M1[PC +1] valP ← PC + 2
irmovq V, rB	icode:ifun ← M1[PC] rA:rB ← M1[PC +1] valC ← M8[PC + 2] valP ← PC + 10
rmmovq rA, D(rB)	icode:ifun ← M1[PC] rA:rB ← M1[PC +1] valC ← M8[PC + 2] valP ← PC + 10
mrmovq D(rB), rA	icode:ifun ← M1[PC] rA:rB ← M1[PC +1] valC ← M8[PC + 2] valP ← PC + 10

OPq rA, rB	icode:ifun ← M1[PC] rA:rB ← M1[PC +1] valP ← PC + 2
jXX Dest	icode:ifun ← M1[PC] valC ← M8[PC + 1] valP ← PC + 9
cmovXX rA, rB	icode:ifun ← M1[PC] rA:rB ← M1[PC + 1] valP ← PC + 2
pushq rA	icode:ifun ← M1[PC] rA:rB ← M1[PC +1] valP ← PC + 2
pop rA	icode:ifun ← M1[PC] rA:rB ← M1[PC +1] valP ← PC + 2

Decode

Instructions	Decode
halt	n/a
nop	n/a
rrmovq rA, rB	valA ← R[rA]
irmovq V, rB	n/a
rmmovq rA, D(rB)	valA ← R[rA] valB ← R[rB]
mrmovq D(rB), rA	valB ← R[rB]
OPq rA, rB	valA ← R[rA] valB ← R[rB]
jXX Dest	n/a
cmovXX rA, rB	valA ← R[rA]
pushq rA	valA ← R[%rA] valB ← R[%rsp]
pop rA	valA ← R[%rsp] valB ← R[%rsp]

Execute

Instructions	Execute
halt	cpu.stat = HALT
nop	n/a
rrmovq rA, rB	valE ← 0 + valA
irmovq V, rB	valE ← 0 + valC
rmmovq rA, D(rB)	valE ← valC + valB
mrmovq D(rB), rA	valE ←valC + valB
OPq rA, rB	valE ← valB OP valA set CC
jXX Dest	cnd ← cond(CC, ifun)
cmovXX rA, rB	valE ← 0 + valA
pushq rA	valE ← valB + - 8
pop rA	valE ← valB + 8

Memory

Instructions	Memory
halt	n/a
nop	n/a
rrmovq rA, rB	n/a
irmovq V, rB	n/a
rmmovq rA, D(rB)	M8[valE] ← valA
mrmovq D(rB), rA	valM ← M8[valE]
OPq rA, rB	n/a
jXX Dest	n/a
cmovXX rA, rB	n/a
pushq rA	M8[valE] ← valA
pop rA	valM ← M8[valA]

Write Back

Instructions	Write Back
halt	n/a
nop	n/a
rrmovq rA, rB	R[rB] ← valE
irmovq V, rB	R[rB] ← valE
rmmovq rA, D(rB)	n/a
mrmovq D(rB), rA	R[rA] ← valM
OPq rA, rB	R[rB] ← valE
jXX Dest	n/a
cmovXX rA, rB	R[rB] ← valE
pushq rA	R[%rsp] ← valE
pop rA	R[%rA] ← valM R[%rsp] ← valE

PC Update

Instructions	PC Update
halt	PC ← 0
nop	PC ← valP
rrmovq rA, rB	PC ← valP
irmovq V, rB	PC ← valP
rmmovq rA, D(rB)	PC ← valP
mrmovq D(rB), rA	PC ← valP
OPq rA, rB	PC ← valP
jXX Dest	PC ← cnd ? valC:valP
cmovXX rA, rB	PC ← valP
pushq rA	PC ← valP
pop rA	PC ← valP