Y86 Instruction Set Reference

Instruction	Byte offset from PC									
	0	1	2	3	4	5	6	7	8	9
halt	0 0									
nop	1 0									
cmovXX rA, rB	2 fn	rA rB								
irmovq V, rB	3 0	f rB	V							
rmmovq rA, D(rB)	4 0	rA rB	D							
mrmovq D(rB), rA	5 0	rA rB	D							

Instruction	Byte offset from PC								
	0	1	2	3	4	5	6	7	8
OPq rA, rB	6 fn	rA rB							
jXX Dest	7 fn	Dest							
call Dest	8 0	Dest							
ret	9 0								
pushq rA	a 0	rA f							
popq rA	b 0	rA f							

cmovXX:			
rrmovq	20	cmovne	24
cmovle	21	cmovge	25
cmovl	22	cmovg	26
cmove	23		

OPq:			
addq	60		
subq	61		
andq	62		
xorq	63		

jXX:			
jmp	70	jne	74
jle	71	jge	75
jl	72	jg	76
je	73		

Registers:			
%rax$^+$	0	%rbp*	5
%rcx$^+$	1	%rsi$^+$	6
%rdx$^+$	2	%rdi$^+$	7
%rbx*	3	%r8-%r11$^+$	
%rsp	4	%r12-%r14*	

$^+$caller-save *callee-save

Args:
%rdi
%rsi
%rdx
%rcx
%r8
%r9

Stage	HALT	NOP	CMOV	IRMOVQ
Fch	icode:ifun ← M_1[PC] valP ← PC + 1	icode:ifun ← M_1[PC] valP ← PC + 1	icode:ifun ← M_1[PC] rA:rB ← M_1[PC+1] valP ← PC + 2	icode:ifun ← M_1[PC] rA:rB ← M_1[PC+1] valC ← M_8[PC+2] valP ← PC + 10
Dec			valA ← R[rA]	
Exe	cpu.stat = HLT		valE ← valA Cnd ← Cond(CC,ifun)	valE ← valC
Mem				
WB			Cnd ? R[rB] ← valE	R[rB] ← valE
PC	PC ← 0	PC ← valP	PC ← valP	PC ← valP

Stage	RMMOVQ	MRMOVQ	OPq	jXX
Fch	icode:ifun ← M_1[PC] rA:rB ← M_1[PC+1] valC ← M_8[PC+2] valP ← PC + 10	icode:ifun ← M_1[PC] rA:rB ← M_1[PC+1] valC ← M_8[PC+2] valP ← PC + 10	icode:ifun ← M_1[PC] rA:rB ← M_1[PC+1] valP ← PC + 2	icode:ifun ← M_1[PC] valC ← M_8[PC+1] valP ← PC + 9
Dec	valA ← R[rA] valB ← R[rB]	valB ← R[rB]	valA ← R[rA] valB ← R[rB]	
Exe	valE ← valB + valC	valE ← valB + valC	valE ← valB OP valA Set CC	Cnd ← Cond(CC,ifun)
Mem	M_8[valE] ← valA	valM ← M_8[valE]		
WB		R[rA] ← valM	R[rB] ← valE	
PC	PC ← valP	PC ← valP	PC ← valP	PC ← Cnd ? valC:valP

Stage	CALL	RET	PUSHQ	POPQ
Fch	icode:ifun ← M_1[PC] valC ← M_8[PC+1] valP ← PC + 9	icode:ifun ← M_1[PC] valP ← PC + 1	icode:ifun ← M_1[PC] rA:rB ← M_1[PC+1] valP ← PC + 2	icode:ifun ← M_1[PC] rA:rB ← M_1[PC+1] valP ← PC + 2
Dec	valB ← R[RSP]	valA ← R[RSP] valB ← R[RSP]	valA ← R[rA] valB ← R[RSP]	valA ← R[RSP] valB ← R[RSP]
Exe	valE ← valB - 8	valE ← valB + 8	valE ← valB - 8	valE ← valB + 8
Mem	M_8[valE] ← valP	valM ← M_8[valA]	M_8[valE] ← valA	valM ← M_8[valA]
WB	R[RSP] ← valE	R[RSP] ← valE	R[RSP] ← valE	R[RSP] ← valE R[rA] ← valM
PC	PC ← valC	PC ← valM	PC ← valP	PC ← valP