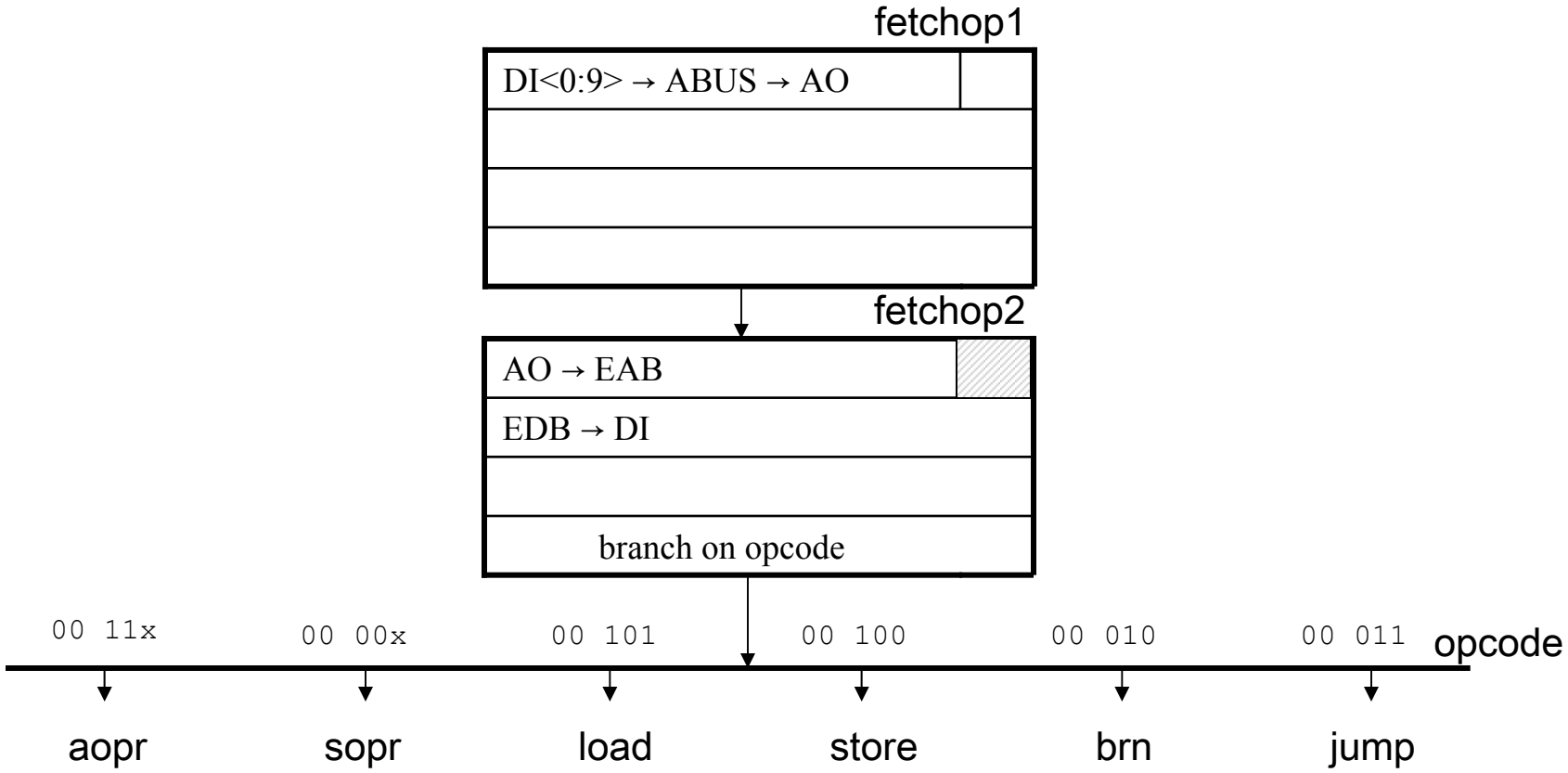
Easy I
Control Unit
(Level 3 Flowcharts)

FetchOp



Easy I
Control Unit State Transition Table (Part I)

Curr State	opcode	I	AC:15	Next State	ALU op	Mem OP	PC sel	PC is	DI le	AC le	AO sel	AO le	EDB sel
reset1	xx xxx	x	x	reset2	XXX	NOP	01	X	0	0	X	0	X
reset2	xx xxx	x	x	fetch	XXX	NOP	10	1	0	0	0	1	X
fetch	00 00x	1	x	fetchop	XXX	NOP	11	X	1	0	X	0	X
fetch	00 00x	0	x	sopr	XXX	NOP	11	X	1	0	X	0	X
fetch	00 010	0	x	brn1	XXX	RD	11	X	1	0	X	0	X
fetch	00 011	0	x	jump	XXX	RD	11	X	1	0	X	0	X
fetch	00 100	0	x	store1	XXX	RD	11	X	1	0	X	0	X
fetch	00 101	0	x	load1	XXX	RD	11	X	1	0	X	0	X
fetch	00 11x	0	x	aopr	XXX	RD	11	X	1	0	X	0	X
aopr	00 110	x	x	fetch	AND	NOP	10	1	0	1	0	1	X
aopr	00 111	x	x	fetch	ADD	NOP	10	1	0	1	0	1	X
sopr	00 000	x	x	fetch	NOTB	NOP	10	1	0	1	0	1	X
sopr	00 001	x	x	fetch	SHRB	NOP	10	1	0	1	0	1	X

Easy I

Control Unit State Transition Table (Part II)

Current State	opcode	I	AC: 15	Next State	ALU op	Mem OP	PC sel	PC is	DI le	AC le	AO sel	AO le	EDB sel
store1	xx xxx	x	x	store2	XXX	NOP	11	X	0	0	1	1	X
store2	xx xxx	x	x	store3	XXX	WR	10	1	0	0	0	1	1
load1	xx xxx	x	x	load2	XXX	NOP	11	X	0	0	1	1	X
load2	xx xxx	x	x	load3	XXX	RD	11	X	1	0	X	0	X
load3	xx xxx	x	x	fetch	A	NOP	10	1	0	1	0	1	X
brn1	xx xxx	x	0	fetch	XXX	NOP	10	1	0	0	0	1	X
brn1	xx xxx	x	1	brn2	XXX	NOP	10	1	0	0	0	1	X
brn2	xx xxx	x	x	fetch	XXX	NOP	10	0	0	0	1	1	X
jump	xx xxx	x	x	fetch	XXX	NOP	10	0	0	0	1	1	X
fetchop1	xx xxx	x	x	fetch	XXX	NOP	11	X	0	0	1	1	X

Can share this state

Easy-I Control Unit

4-bit Encodings for States

State	Encoding
reset1	0000
reset2	0001
fetch	0010
aopr	0011
sopr	0100
store1	0101
store2	0110
store3	0111
load1	1000
load2	1001
load3	1010
brn1	1011
brn2	1100
jump	1101
fetchop1	1110

ALU Operation Table

Operation	Code	Output
A	000	A
NOTB	001	not B
AND	010	A and B
ADD	011	A + B
SHRB	100	B / 2

We know how to implement this ALU !

Control Bus Operation Table

Operation	Code
NOP	00
ReaD	01
WRite	10