8-bit Processor Specification

8-bit Instruction format

opcode	rd	rs
opcode	rd	imm[1:0]
opcode	imm[3:0]	
7 4	3 2	1 0

Instructions

opcode	reg/val	reg/val	Machine code
LD		imm	0000
ST		imm	0001
MR	rd	rs	0011
MI	rd	imm	0010
SUM	rd	rs	0100
SMI	rd	imm	1100
SB	rd	rs	0101
SBI	rd	imm	1101
CM	rd	rs	0111
CMI	rd	imm	1111
ANR	rd	rs	0110
ANI	rd	imm	1110
ORR	rd	rs	1000
ORI	rd	imm	1001
XRR	rd	rs	1010
XRI	rd	imm	1011

👉Note:

→ 2-bit line for register address representation
→ Each register can hold value of 8-bit width, there are total 4-registers
→ 4-bit msb of instructions represent opcode
→ There is total 16 instructions
→ Immediate value is extended by 4-bit sign extended at msb in load/store mode instructions and 6-bit sign extended in immediate addressing mode instructions