

Ben Eater 8-Bit Computer Instructions Overview

Opcode	Dec	Bin	Step 0	Step 1	Step 2	Step 3	Step 4	Usage	Description
NOP	00	0000	CO MI	RO II CE	0	0	0	0000 XXXX	No operation
LDA	01	0001	CO MI	RO II CE	IO MI	RO AI	0	0001 AAAA	Load contents of memory address AAAA into A register
ADD	02	0010	CO MI	RO II CE	IO MI	RO BI	EO AI FI	0010 AAAA	Load contents of memory address AAAA into B register , add A+B, store result in A register
SUB	03	0011	CO MI	RO II CE	IO MI	RO BI	EO AI SU FI	0011 AAAA	Load contents of memory address AAAA into B register, subtract A-B, store result in A register
STA	04	0100	CO MI	RO II CE	IO MI	AO RI	0	0100 AAAA	Store contents of A register at memory address AAAA
LDI	05	0101	CO MI	RO II CE	IO AI	0	0	0101 VVVV	Load 4-bit immediate value into A register (loads VVVV into A register)
JMP	06	0110	CO MI	RO II CE	IO J	0	0	0110 AAAA	Unconditional jump: Set program counter to AAAA, to resume execution from there
JC	07	0111	CO MI	RO II CE	IO J / 0	0	0	0111 AAAA	Jump if carry: Set program counter to AAAA when carry flag is set, to resume from there. When carry flag is not set, resume normally.
JZ	08	1000	CO MI	RO II CE	IO J / 0	0	0	1000 AAAA	Jump if zero: Set program counter to AAAA when zero flag is set, to resume from there. When zero flag is not set, resume normally.
	09	1001	CO MI	RO II CE	0	0	0		
	10	1010	CO MI	RO II CE	0	0	0		
	11	1011	CO MI	RO II CE	0	0	0		
	12	1100	CO MI	RO II CE	0	0	0		
	13	1101	CO MI	RO II CE	0	0	0		
OUT	14	1110	CO MI	RO II CE	AO OI	0	0	1110 XXXX	Output contents of A register to 7-segment display; displayed as decimal
HLT	15	1111	CO MI	RO II CE	HLT	0	0	1111 XXXX	Halt execution

