

8086 Instruction Set Summary

The following is a brief summary of the 8086 instruction set:

Data Transfer Instructions

MOV	Move byte or word to register or memory
IN, OUT	Input byte or word from port, output word to port
LEA	Load effective address
LDS, LES	Load pointer using data segment, extra segment
PUSH, POP	Push word onto stack, pop word off stack
XCHG	Exchange byte or word
XLAT	Translate byte using look-up table

Logical Instructions

NOT	Logical NOT of byte or word (one's complement)
AND	Logical AND of byte or word
OR	Logical OR of byte or word
XOR	Logical exclusive-OR of byte or word
TEST	Test byte or word (AND without storing)

Shift and Rotate Instructions

SHL, SHR	Logical shift left, right byte or word by 1 or CL
SAL, SAR	Arithmetic shift left, right byte or word by 1 or CL
ROL, ROR	Rotate left, right byte or word by 1 or CL
RCL, RCR	Rotate left, right through carry byte or word by 1 or CL

Arithmetic Instructions

ADD, SUB	Add, subtract byte or word
ADC, SBB	Add, subtract byte or word and carry (borrow)
INC, DEC	Increment, decrement byte or word
NEG	Negate byte or word (two's complement)
CMP	Compare byte or word (subtract without storing)
MUL, DIV	Multiply, divide byte or word (unsigned)
IMUL, IDIV	Integer multiply, divide byte or word (signed)
CBW, CWD	Convert byte to word, word to double word (useful before multiply/divide)
AAA, AAS, AAM, AAD	ASCII adjust for addition, subtraction, multiplication, division (ASCII codes 30-39)
DAA, DAS	Decimal adjust for addition, subtraction (binary coded decimal numbers)

Transfer Instructions

JMP	Unconditional jump
JA (JNBE)	Jump if above (not below or equal)
JAE (JNB)	Jump if above or equal (not below)
JB (JNAE)	Jump if below (not above or equal)
JBE (JNA)	Jump if below or equal (not above)
JE (JZ)	Jump if equal (zero)
JG (JNLE)	Jump if greater (not less or equal)
JGE (JNL)	Jump if greater or equal (not less)

JL (JNGE)	Jump if less (not greater nor equal)
JLE (JNG)	Jump if less or equal (not greater)
JC, JNC	Jump if carry set, carry not set
JO, JNO	Jump if overflow, no overflow
JS, JNS	Jump if sign, no sign
JNP (JPO)	Jump if no parity (parity odd)
JP (JPE)	Jump if parity (parity even)
LOOP	Loop unconditional, count in CX
LOOPE (LOOPZ)	Loop if equal (zero), count in CX
LOOPNE (LOOPNZ)	Loop if not equal (not zero), count in CX
JCXZ	Jump if CX equals zero

Subroutine and Interrupt Instructions

CALL, RET	Call, return from procedure
INT, INTO	Software interrupt, interrupt if overflow
IRET	Return from interrupt

String Instructions

MOVS	Move byte or word string
MOVSB, MOVSW	Move byte, word string
CMPS	Compare byte or word string
SCAS	Scan byte or word string
LODS, STOS	Load, store byte or word string
REP	Repeat
REPE, REPZ	Repeat while equal, zero
REPNE, REPNZ	Repeat while not equal (zero)

Processor Control Instructions

STC, CLC, CMC	Set, clear, complement carry flag
STD, CLD	Set, clear direction flag
STI, CLI	Set, clear interrupt enable flag
LAHF, SAHF	Load AH from flags, store AH into flags
PUSHF, POPF	Push flags onto stack, pop flags off stack
ESC	Escape to external processor interface
LOCK	Lock bus during next instruction
NOP	No operation (do nothing)
WAIT	Wait for signal on TEST input
HLT	Halt processor