

Evolution of Intel Processor:

4-bit microprocessor:

4004

introduced in 1971

first 4 bit microprocessor,

Used in calculators.

4040

Introduced in 1974

Interrupts features were available.

8 bit microprocessor

8008

Introduced in 1972

First 8 bit microprocessor

Used in calculators, computer terminals, industrial robots.

8080

Introduced in 1974

(improved performance)

8085

Introduced in 1976

Clock speed: 3MHz

246 instructions.

6,500 transistors

Could access 64KB of Memory

8 bit data bus , 16 bit address bus.

Used in early computers.

16 bit microprocessor

8086

Introduced in 1978

16 bit data bus, 20 bit address bus

Clock speed: 5MHz to 10MHz

Could address 1MB of Memory

8088

Introduced in 1979

Made a cheaper version of 8086 and used in industry for personal computers.

80286

32-bit processor

80386

First 32 bit processor

80486

Pentium, Pentium II, Pentium III, Pentium IV

Intel Dual Core.

Points : Could access GB of Memory, Million transistors, caching concept introduced.

64-bit processor:

Intel Core 2

Intel core i3

Intel Core i5

Intel Core i7

Intel Core i9 => introduced in 2017, address GBs of Memory, clock speed GHz, 10 physical cores, billion transistors.

Opcodes means "operation codes". They tell the circuitry (in this case, the microprocessor) which operation to perform e.g. addition, subtraction.

Operands are the data contents on which the operation is to be performed

e.g. MVI A,B

Here instruction MVI is an opcode. A & B are operands

S No	Instruction	No: of machine cycles	Machine cycle - 1	Machine cycle - 2	Machine cycle - 3	Machine cycle - 4
1	MOV A,B	1	OF	-	-	-
2	MVI A, 50H	2	OF	MR	-	-
3	LDA 5000H	4	OF	MR	MR	MR
4	STA 5000H	4	OF	MR	MR	MW
5	IN 80H	3	OF	MR	IOR	-
6	OUT 80H	3	OF	MR	IOW	-

LXI B, 2050H : 3 byte Instruction. (OF + MR + MR)

10 is called LF or Line Feed or new line and 13 is called CR or Carriage return.
String db "hello",13,10,'\$'