Addressing modes in 8085 microprocessor

The way of specifying data to be operated by an instruction is called addressing mode.

Types of addressing modes – In 8085 microprocessor there are 5 types of addressing modes

1)Immediate Addressing Mode – In this mode, the 8/16-bit data is specified in the instruction itself as one of its operand. The source operand is always data. If the data is 8-bit, then the instruction will be of 2 bytes, if the data is of 16-bit then the instruction will be of 3 bytes.

For example: MVI K, 20H: means 20H is copied into register K.

ADI 34H – This instruction adds the immediate data, 34H to the accumulator.
34H is the data here. H represents Hexadecimal value and the immediate value is added to the accumulator. In this case 34H is added to the accumulator. Suppose if accumulator has a value 8H and when this instruction is executed, 34H is added to the 8H and the result is stored in accumulator.

2) Register addressing mode- In this mode, the data is copied from one register to another. Therefore the operation is performed within various registers of the microprocessor.

For example: MOV A, B
Here the Opcode is MOV. If the above instruction is executed, the contents of Register B are moved to the Register A, which is nothing but the accumulator.

3) Direct Addressing Mode – In direct addressing mode, the data to be operated is available inside a memory location and that memory location is directly specified as an operand. The operand is directly available in the instruction itself. There is a subtle difference between the direct addressing modes and immediate addressing modes. In immediate addressing mode the data itself is specified within instruction, but in direct addressing mode the address of the data is specified in the instruction.

Example:-

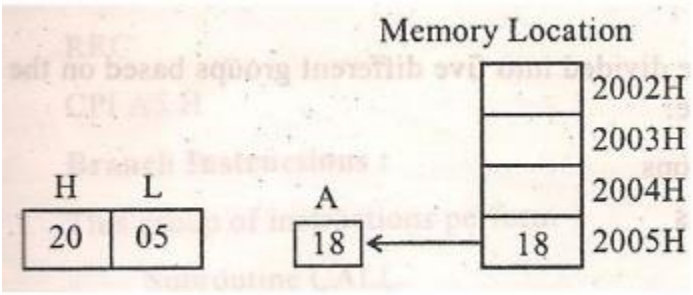
OUT 10H
LDA 4100H
STA 2000H
Consider the instruction **STA 2000H**
When this instruction is executed, the contents of the accumulator are stored in the memory location specified. In the above example the contents of accumulator are stored in memory location 2000H.

4) Register Indirect Addressing Mode: This is indirect way of addressing. In this mode the instruction specifies the name of the register in which the address of the data is available.
Example:
MOV A, M
SUB M

DCR M

Consider MOV A, M. This instruction will move the contents of memory location, whose address is in H-L register pair to the accumulator.

M represents the address present in the H-L register pair. So when MOV A, M is executed, the contents of the address specified in H-L register pair are moved to accumulator.



5) Implicit Addressing Mode: There are certain instructions in 8085 which does not require the address of the operand to perform the operation. They operate only upon the contents of accumulator.

Example:

CMA

RAL

RAR

CMA complements the contents of accumulator.

If RAL is executed the contents of accumulator is rotated left one bit through carry.

If RAR is executed the contents of accumulator is rotated right one bit through carry.