

ADDRESSING MODES OF 8085

Addressing Modes are the different ways by which the μP address (specifies) the operands in an instruction. 8085 supports the following Addressing Modes:

1) Immediate Addressing Mode

In this mode, the **Data is specified in the Instruction itself.**

Eg: **MVI A, 35H** ; Move immediately the value 35 into the Accumulator.
; i.e. $A \leftarrow 35H$
LXI B, 4000H ; Move immediately the value 4000 into the register pair BC.
; i.e. $BC \leftarrow 4000H$

Advantage:

Programmer can easily **identify** the **operands**.

Disadvantage:

Always more than one byte hence requires **more space**.

The μP requires **two or three machine cycles** to fetch the instruction hence **slow**.

2) Register Addressing Mode

In this mode, the **Data** is specified **in Registers**.

Eg: **MOV B, C** ; Move the Contents of C-Register into B-Register.
; i.e. $B \leftarrow C$
INR B ; Increments the contents of B-Register.
; i.e. $B \leftarrow B + 1$

Advantage:

The μP requires **only one machine cycle** to Fetch the instruction. small size

Disadvantage:

Operands **cannot** be easily **identified**. Complex

3) Direct Addressing Mode

In this mode, the **Address** of the operand is specified **in the Instruction** itself.

Eg: **LDA 2000H** ; **Loads the Accumulator** with the Contents of Location 2000.
; i.e. $A \leftarrow [2000]$
STA 2000H ; **Stores the Contents of the Accumulator** at the Location 2000.
; i.e. $[2000] \leftarrow A$

Advantage:

The programmer **can identify** the address of the operand.

Disadvantage:

These are **three byte instructions** hence require three fetch cycles.

4) Indirect Addressing Mode

In this mode, the **Address** of the operand is specified **in Registers**.

Hence, the instruction indirectly points to the operands.

Even the Memory Pointer "M" can be used as it is pointed by the HL register pair.

Eg: **STAX B** ; Stores the contents of the Accumulator at the location
 ; pointed by the contents of BC pair.
 ; i.e. $[[BC]] \leftarrow A$.
 ; So if contents of BC pair = 4000 i.e. $[BC] = 4000$ then
 ; $[4000] \leftarrow A$. #Please refer Bharat Sir's Lecture Notes for this ...
 ; Increments the contents of the location pointed by HL pair
 ; (i.e. M) i.e. $[[HL]] \leftarrow [[HL]] + 1$



INR M

Advantage:

Address of the operand is **not fixed** and hence can be used in a **loop**.

Size of the instruction is **small** as compared to direct addressing mode.

Disadvantage:

Requires initialization of the register pair hence requires atleast one more instruction.

5) Implied Addressing Mode

In this mode, the **Operand** is **implied** in the instruction.

This instruction will work only on that implied operand, and not on any other operand.

Eg: **STC** ; Sets the Carry Flag in the Flag register.
 ; $Cy \leftarrow 1$.
 ; Complements the Carry Flag in the Flag register.
 ; $Cy \leftarrow \text{Cy-complement}$

Advantage:

Instructions are generally **only one byte**.

Disadvantage:

Programmer **cannot** easily **identify** the value of the operand.