

8.6 ADDRESSING MODES OF 8086

Every instruction performs operation on the specified data or operand which resides either in the register, memory or accumulator. Addressing mode is a way of locating the data or operands.

There are eight addressing modes of 8086 :

1. Immediate Addressing

In this type of addressing mode, operand is a part of the instruction.

For example:

```
MOV AX, 2050H
```

In the above example, the contents 2050H are moved into AX register

```
MOV AL, 34H
```

In the above example the contents 34H are moved into AL register.

2. Direct Addressing

In this type of addressing mode, the 16 bit offset address is directly specified in the instruction itself.

For example:

```
MOV AX, [2040H]
```

In this example, the effective address is computed by adding the contents of offset address i.e 2040H and the contents of DS register (DS contains the starting address of the data segment where the data resides) and the data is moved to register AX.

3. Register Addressing

In this mode of addressing the operand is stored in a register. All registers except IP can be used in this mode.

For example:

MOV AX, BX

In this example, the contents of BX are moved into AX register.

4. Register Indirect Addressing

In this type of addressing mode, the address of data is obtained using indirect way with the help of offset registers. The offset address of data is in BX, SI or DI register. The default segment is DS or ES.

For example:

MOV DX, [BX]

In this example, the data resides in the memory location in DS whose offset address is in BX.

5. Indexed Addressing

In this addressing mode, the offset address of the operand is computed by adding 8-bit or 16-bit displacement to the contents of the index registers SI or DI.

For example:

MOV CX, [SI + 40]

Here the data is present in the memory location in DS at an offset address computed as SI + 40.

6. Based Addressing

In this addressing mode, the effective address is computed by adding 8-bit or 16-bit displacement with the contents of BX or BP register.

For example:

MOV AX, [BX+1080H]

In this example, the contents of BX are added with 1080H (16-bit displacement) and the result is moved into AX.

7. Based Indexed Addressing

In this addressing mode, the effective address of the data is obtained by adding the contents of BX or BP to the content of SI or DI registers.

`MOV CX, [BX + SI]`

8. Based Indexed with Displacement

In this addressing mode the effective address of the data is computed by adding the contents of BX or BP and SI or DI and the 8-bit or 16-bit displacement.

For example:

`MOV CX, [BX + SI + 2010H]`