

# Microprocessor - 8086 Addressing Modes

The different ways in which a source operand is denoted in an instruction is known as **addressing modes**. There are 8 different addressing modes in 8086 programming –

## Immediate addressing mode

The addressing mode in which the data operand is a part of the instruction itself is known as immediate addressing mode.

### Example

```
MOV CX, 4929 H, ADD AX, 2387 H, MOV AL, FFH
```

## Register addressing mode

It means that the register is the source of an operand for an instruction.

### Example

```
MOV CX, AX    ; copies the contents of the 16-bit AX register into  
              ; the 16-bit CX register),  
ADD BX, AX
```

## Direct addressing mode

The addressing mode in which the effective address of the memory location is written directly in the instruction.

### Example

```
MOV AX, [1592H], MOV AL, [0300H]
```

## Register indirect addressing mode

This addressing mode allows data to be addressed at any memory location through an offset address held in any of the following registers: BP, BX, DI & SI.

### Example

```
MOV AX, [BX]    ; Suppose the register BX contains 4895H, then the contents
                ; 4895H are moved to AX
ADD CX, {BX}
```

## Based addressing mode

In this addressing mode, the offset address of the operand is given by the sum of contents of the BX/BP registers and 8-bit/16-bit displacement.

### Example

```
MOV DX, [BX+04], ADD CL, [BX+08]
```

## Indexed addressing mode

In this addressing mode, the operands offset address is found by adding the contents of SI or DI register and 8-bit/16-bit displacements.

### Example

```
MOV BX, [SI+16], ADD AL, [DI+16]
```

## Based-index addressing mode

In this addressing mode, the offset address of the operand is computed by summing the base register to the contents of an Index register.

### Example

```
ADD CX, [AX+SI], MOV AX, [AX+DI]
```

# Based indexed with displacement mode

In this addressing mode, the operands offset is computed by adding the base register contents. An Index registers contents and 8 or 16-bit displacement.

## Example

```
MOV AX, [BX+DI+08], ADD CX, [BX+SI+16]
```