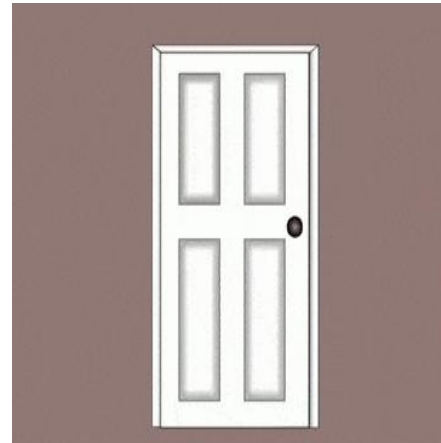# SNS COLLEGE OF ENGINEERING

(Autonomous)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

19SB405 – MICROPROCESSORS AND ADVANCED MICROCONTROLLERS

Guess Today's Topic????

Addressing modes

Definition:-

❖ Addressing mode indicates a way of locating data or operands.
❖ The addressing modes describe the types of operands and the way
❖ they are accessed for executing an instruction..

❖ The 8086 provides a total of 8 distinct addressing modes.

Types of Addressing modes

| Immediate	Register	Direct
Register Indirect	Indexed	Register Relative
Based Indexed	Relative Based Indexed	Intersegment direct
Intersegment indirect	Intrasegment direct	Intrasegment indirect

Immediate addressing mode

Immediate: In this type of addressing, immediate data is a part of instruction and appears in the form of successive byte or bytes.

Ex: MOV AX, 5000H   (0000 0000 0000 0101)

In the above example, 0005H is the immediate data. The immediate data may be 8-bit or 16-bit in size..

| Opcode	Operand

Immediate Addressing Mode
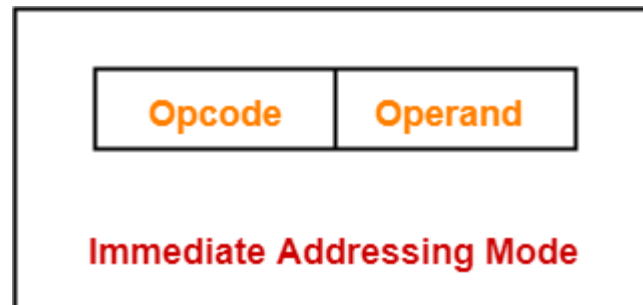
Direct addressing mode

In the direct addressing mode a 16-bit memory address (offset) is directly specified in the instruction as a part of it.

Ex: MOV AX, [5000 H]

Here, data resides in a memory location in the data segment, whose effective address may be completed using 5000H as the offset address and content of DS as segment address. The effective address here, is 10H * DS + 5000H.
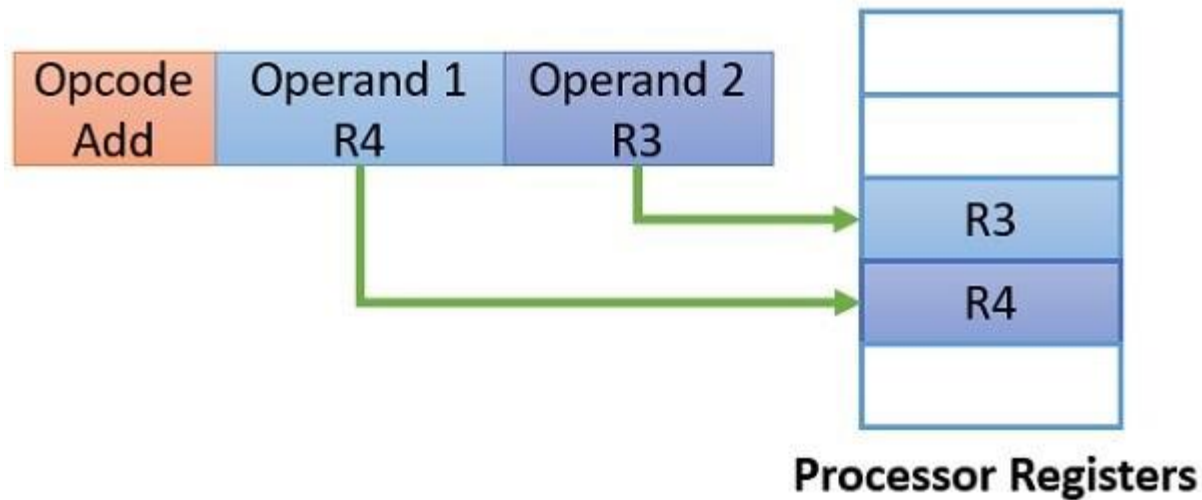

Direct Addressing Mode
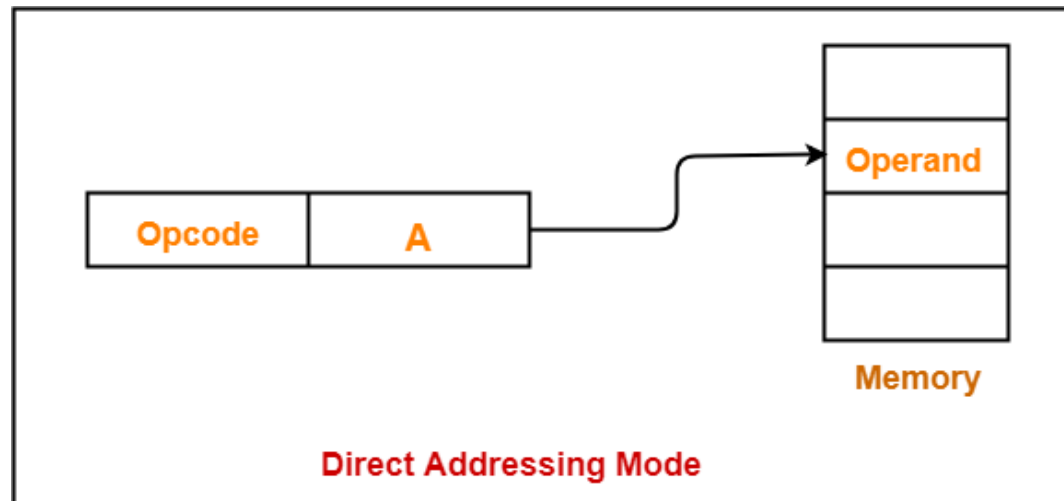
Register addressing mode

In register addressing mode, the data is stored in a register and is referred using the particular register. All the registers, except IP, may be used in this mode..

Example :-

Ex: MOV BX, AX
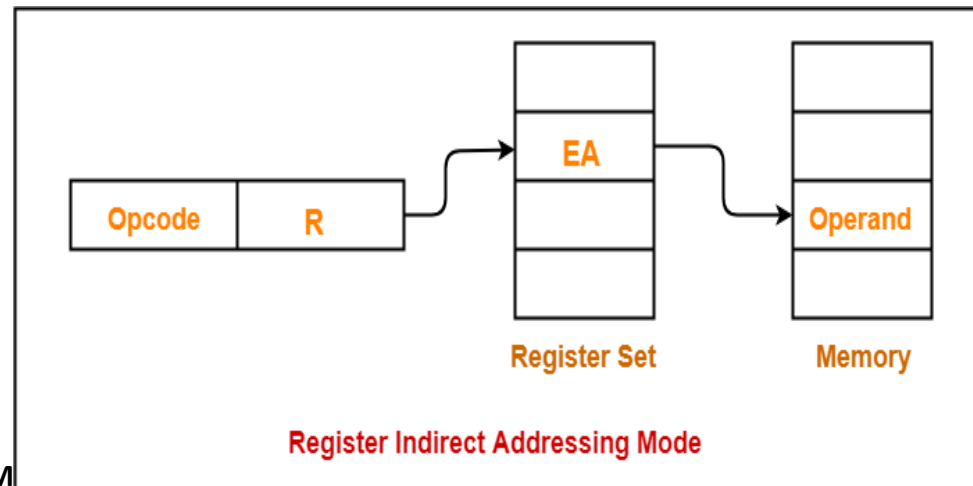
Register indirect addressing mode

In this addressing mode, the offset address of data is in either BX or SI or DI register.
 The default segment is either DS or ES.
The data is supposed to be available at the address pointed to by the content of any of the above registers in the default data segment.

Ex: MOV AX, [BX]

Here, data is present in a memory location in DS whose offset address is in BX. The effective address of the data is given as 10H * DS+[BX].

Register Indirect Addressing Mode

Indexed addressing mode

In this addressing mode, offset of the operand is stored in one of the index registers. DS and ES are the
default segments for index registers, SI and DI respectively. This is a special case of register indirect addressing mode.

Ex: MOV AX, [SI]

Here, data is available at an offset address stored in SI in DS. The effective address, in this case, is computed as
10*DS+[SI].

Register Relative addressing mode

In this addressing mode, the data is available at an effective address formed by adding an 8-bit or 16-bit displacement with the content of any one of the registers BX, BP, SI and DI in the default (either DS or ES) segment.

Ex: MOV AX, 50 H [BX]
0101 0000

Effective address is given as 10H *DS+50H+[BX]

Based Indexed addressing mode

The effective address of data is formed, in this addressing mode, by adding content of a base register (any one of BX or BP) to the content of an index register (any one of SI or DI). The default segment register may be ES or DS.

Ex: MOV AX, [BX][SI]

BX is the base register and SI is the index register the effective address is computed as 10H * DS + [BX] + [SI].

Microprocessors and Microcontrollers/19SB405/ K.Sangeetha/ Unit 1/ Addressing Mode of 8086   **11.08.2020**

Relative Based Indexed addressing mode

The effective address is formed by adding an 8 or 16-bit displacement with the sum of the
contents of any one of the base register (BX or BP) and any one of the index register, in a default segment.

Ex: MOV AX, 50H [BX] [SI]

Here, 50H is an immediate displacement, BX is base register and SI is an index register the effective address of data is computed as
 10H * DS + [BX] + [SI] + 50H

1. **Explain Direct Addressing and Immediate addressing mode**

THANK YOU

Bye
Bye