Republic of Iraq
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8085 Microprocessor

Lecture 4

المدرس ضرغام الخفاف الاسدي

Third Year lecture notes

Avionics Engineering Dept.

Engineering Technical College/ NAJAF 2020-2021

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ADDRESSING MODES

There are various techniques to specify the data for instruction. These techniques are called addressing modes:

1. Direct Addressing
2. Register Addressing
3. Immediate Addressing
4. Implied Addressing

- **Direct Addressing:** In this mode of addressing, the address of the operand is given in the instruction itself.
- For example LDA 2100 H
  OUT 03 H etc.
- **Register Addressing:** In this mode of addressing, the operands are in registers.
- For example MOV A , B
  ADD C etc.
- **Immediate Addressing:** In immediate addressing mode, the operand in specified in the instruction itself.
- For example MVI B, 08 H
  ANI 07 H etc.
- **Implied Addressing:** There are certain instructions which operate on the contents of the accumulator. Such instructions do not require the address of the operand, since the operand is implied in the instruction itself. So this type of addressing mode is called as Implied Addressing.
- For example CMA
  RAL
  RAR

INSTRUCTION TYPES

The machine codes of all instructions are not of same length. Following are the types of instructions:

(i) One Byte Instruction

(ii) Two Byte Instruction

(iii) Three Byte Instruction

One Byte Instruction

This type of instruction has only op code part of one byte and no operand is given. The instruction length is only of one byte. It can be stored only in one memory location.

- For example MOV A, C

  ADD C

If 'MOV A, C' instruction is to be stored in some location say 2000 H, then its op-code of one byte is to be fed in this memory location.

i.e. 2000 H 79 H

where 79 H is the op code of the instruction 'MOV A, C'.

Two Byte Instruction

In a two byte instruction, first byte of the instruction is its op code and second byte is the given data. Such instruction is stored in two consecutive memory locations.

For example MVI A, 06 H

OUT 03 H

ANI 76 H etc.

In order to store the instruction say 'MVI A, 06 H' in the memory locations of the computer, we have to use two consecutive memory locations. In one memory location the op code of MVI A is to be stored and in the second location the data 06H is to be stored. This type of instruction to be stored in two locations say in 2101 H and 2102 H is given below:

- 2101H 3E H (op code of MVI A)
- 2102H 06 H (given data)

Three Byte Instruction

In a three byte instruction, first byte is used for its op code and second and third bytes are used for 16 bit address. Such an instruction is stored in three consecutive memory locations.

- For example LDA 2100 H
  STA 3000 H
  JMP 2500 H etc.

In order to store the instruction say 'LDA 2100 H' three consecutive memory locations are to be used. In the first memory location op code of the instruction is stored, in second location lower byte of the address is to be stored and in the third byte upper byte of the address is to be stored. This instruction loaded in three consecutive memory location 2000H, 2001H and 2002H is given below:

- 2000H 3A H (op code of LDA)
- 2001H 00 H (Lower byte of address 2100 H)
- 2002H 21 H (Upper byte of address 2100 H)

Thank you