Rohan Nyati

500075940

R177219148

Batch – 5 (AI & ML)

Experiment – 2   Date : 02/02/2022

AIM :

To explain the classification of the instructions of 8085A & to define the various addressing mode in the 8085A.

APPARATUS :

8085 Microprocessors

8085 INSTRUCTION CLASSIFICATION:

The function of a microprocessor system is implemented by a sequence of data transfers between memory, processor and I/O devices and data transformations that occur in the registers within the microprocessor, manipulating a register under program control , addressing it and using it for data transfer and transformation requires a set of binary codes which comprise the INSTRUCTION SET OF A MICRO-PROCESSOR.

The 8085A instructions can be classified into the following five functional categories.

i) Data transfer (copy) operations,
ii) Arithmetic operations ,
iii) Logical operations
iv) Branching operations and
v) Machine-control operations.

Since data and instructions may reside anywhere in internal registers, external register or memory, locating them requires a particular addressing. The instructions in these five functional groups can be categorized according to their method of addressing the hardware registers and memory. This method is called the ADDRESSING MODE and six modes are available with 8085A which are explained in detail here,

i)   Implied addressing
ii) Register addressing
iii) Immediate addressing

iv) Direct addressing
v) Register indirect addressing
vi) Combined addressing.

IMPLIED ADDRESSING:

The instructions using this mode have no explicit operands. Examples include

STC   (Set Carry Flag)

DAA   (Decimal Adjust Accumulator)

REGISTER ADDRESSING:

This is mode specifies the register or register pair that contains data. Both the source and the destination operand are registers.

For example,

MOV   B, C

Moves the contents of register C to register B.

IMMEDIATE ADDRESSING:

For an 8-bit data, this mode uses 2 bytes, with the first byte as the OP code, followed by 1 byte of data. On the other hand, for 16-bit data, this instruction contains 3 bytes, with the first byte as the OP code followed by 2 bytes of data. For example,

MVI   B, 05

Loads register B with the value 5 an

LXI   H, 2050

Loads H with 20 and L with 50.

DIRECT ADDRESSING:

Instructions using this mode specify the effective address as a part of the instruction. These instructions contain 3 bytes, with the first byte as the OP code followed by 2 bytes of address of data (the low-order byte of the address in byte 3) . Consider

LDA   2035

This instruction loads accumulator with the contents of memory location 2035. This mode is also called the absolute mode.

REGISTER INDIRECT ADDRESSING:

This mode contains a register pair which stores the address of data (the higher-order byte of the address in the first register of the pair, and low-order byte in the second). As an example,

LDAX   B

Loads the accumulator with the contents of a memory location addressed by B and C register pair.

COMBINED ADDRESSING MODES:

Some instructions use a combination of addressing modes. A CALL instruction, for example, combines direct addressing and register indirect addressing. The direct address in a CALL instruction specifies the address of the desired subroutines; the register indirect address is that of stack pointer. The CALL instruction pushes the current contents of the program counter into the memory location specified by the stack pointer. The address that follows the CALL instruction is copied to pc and hence execution starts at the address of the subroutine.

PROCEDURE:

1. We try to get the basic understanding about classification of the instructions of 8085A microprocessor.
2. Then we learn about its various ADDRESSING MODE.

RESULT :

We learned and understood various basic concepts and applications of 8085 Microprocessor and its different addressing modes. .