SUBJECT: MICROPROCESSOR ARCHITECTURE AND PROGRAMMING

TOPIC   : ASSEMBLY LANGUAGE

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MODULE 2

TOPIC:

ASSEMBLY LANGUAGE

Instruction set

- The collection of basic operations supported by microprocessor is called instruction set of microprocessor
- The instruction set determines what functions microprocessor can perform

- Each instruction in an instruction set has 2 parts
- Op code : it specifies task to be performed by microprocessor
- Operand : specifies data to be operated upon

- In 8085, instructions may of 1byte,2 byte,3 byte in length because there are different ways for specifying data for instruction
- Instructions constituting a program is specified in assembly language

Assembly language programming

- It is a low level language for computers ,microprocessors , microcontrollers and other programming devices

- It is based on mnemonics that symbolize processing steps

- Mnemonics assembly language instructions usually consists of an op code mnemonic followed by a comma separated list of data or arguments

- These are translated by a translator program called **assembler** to a stream of executable instructions. This conversion process is referred to as assembly

- Assembler performs a more or less isomorphic translation (a one to one mapping) from mnemonic statements into machine instructions

Components of assembly language program

- It consists of 3 types of instructions
- Op code mnemonics
- Assembler directives
- Pseudo op code

1. Op code mnemonics

- A mnemonic is a symbolic name for a single executable machine language instruction
- Assembly language statement uses following format
- Label1:mnemonic operand1,operand2;comment

Label

- It is a optional field containing symbolic label for the current statement
- Labels are used in assembly language just as in HLL to mark lines as target of goto(jumps)

Mnemonic

- It is an instruction name (eg MOV,ADD)
- The word mnemonic means memory aid
- This field is mandatory

Operands

- The presence of operands depends on instructions.
- Some instructions have no operands ,some have one and some have two.
- If there are 2 operands then they are separated by a comma

Comment

- It start with a semicolon and continues to end of line.
- Comments enhance the readability of program

2.Assembler directives

- Assembly directives are the instructions to assembler to perform various book keeping tasks, storage reservation and other control functions

- They are not translated into machine instructions but executed by assembler at assembly time

- The names of directives often starts with a dot to distinguish them from machine instructions

3. Pseudo opcode

- Pseudo code is a message to the assembler just like a assembler directive.

- They are data defining instructions used to define data elements to hold data and variables
- Eg BYTE,WORD