Microprocessor & Interfacing Lecture 6 8085 Instruction Set--1

ECS DEPARTMENT
DRONACHARYA COLLEGE OF ENGINEERING

Contents

- Introduction
- Instruction Set
- Classification
- Data Transfer instructions

Introduction

- An instruction is the pattern which is used by microprocessor. In 8085 instruction is the combination of opcode and operand.
- Here opcode is the operation code and operand is the data.
 And instruction length could be one byte, two byte and three byte.

Instruction Set

- An instruction is a binary pattern designed inside a microprocessor to perform a specific function.
- The entire group of instructions that a microprocessor supports is called Instruction Set.
- 8085 has 246 instructions.
- Each instruction is represented by an 8-bit binary value.
- These 8-bits of binary value is called Op-Code or instruction byte.

Classification of Instruction Set

- Data Transfer Instruction
- Arithmetic Instructions
- Logical Instructions
- Branching Instructions
- Control Instructions

Data Transfer Instruction

- These instructions move data between registers, or between memory and registers.
- These instructions copy data from source to destination.
- While copying, the contents of source are not modified.

Opcode	Operand	Description
MOV	Rd, Rs M, Rs Rd, M	Copy from source to destination.

- This instruction copies the contents of the source register into the destination register.
- The contents of the source register are not altered.
- If one of the operands is a memory location, its location is specified by the contents of the HL registers.
- Example: MOV B, C or MOV B, M

Opcode	Operand	Description
MVI	Rd, Data M, Data	Move immediate 8-bit

- The 8-bit data is stored in the destination register or memory.
- If the operand is a memory location, its location is specified by the contents of the H-L registers.
- Example: MVI B, 57H or MVI M, 57H

Opcode	Operand	Description
LDA	16-bit address	Load Accumulator

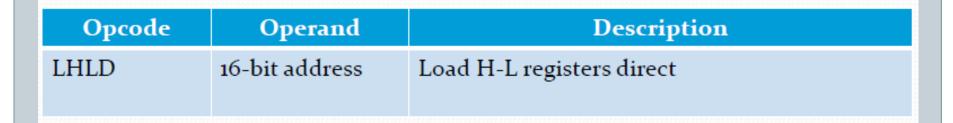
- The contents of a memory location, specified by a 16bit address in the operand, are copied to the accumulator.
- The contents of the source are not altered.
- Example: LDA 2034H

Opcode	Operand	Description
LDAX	B/D Register Pair	Load accumulator indirect

- The contents of the designated register pair point to a memory location.
- This instruction copies the contents of that memory location into the accumulator.
- The contents of either the register pair or the memory location are not altered.
- Example: LDAX B

Opcode	Operand	Description
LXI	Reg. pair, 16-bit data	Load register pair immediate

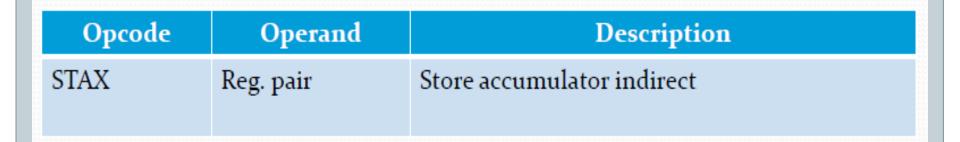
- This instruction loads 16-bit data in the register pair.
- **Example:** LXI H, 2034 H



- This instruction copies the contents of memory location pointed out by 16-bit address into register L.
- It copies the contents of next memory location into register H.
- Example: LHLD 2040 H



- The contents of accumulator are copied into the memory location specified by the operand.
- Example: STA 2500 H



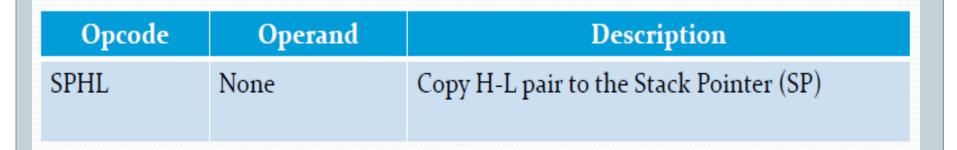
- The contents of accumulator are copied into the memory location specified by the contents of the register pair.
- Example: STAX B

Opcode	Operand	Description
SHLD	16-bit address	Store H-L registers direct

- The contents of register L are stored into memory location specified by the 16-bit address.
- The contents of register H are stored into the next memory location.
- Example: SHLD 2550 H

Opcode	Operand	Description
XCHG	None	Exchange H-L with D-E

- The contents of register H are exchanged with the contents of register D.
- The contents of register L are exchanged with the contents of register E.
- Example: XCHG



- This instruction loads the contents of H-L pair into SP.
- Example: SPHL

Opcode	Operand	Description
XTHL	None	Exchange H-L with top of stack

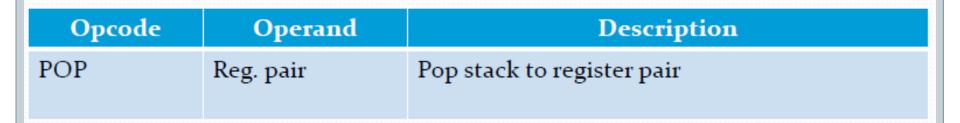
- The contents of L register are exchanged with the location pointed out by the contents of the SP.
- The contents of H register are exchanged with the next location (SP + 1).
- Example: XTHL

Opcode	Operand	Description
PCHL	None	Load program counter with H-L contents

- The contents of registers H and L are copied into the program counter (PC).
- The contents of H are placed as the high-order byte and the contents of L as the low-order byte.
- Example: PCHL

Opcode	Operand	Description
PUSH	Reg. pair	Push register pair onto stack

- The contents of register pair are copied onto stack.
- SP is decremented and the contents of high-order registers (B, D, H, A) are copied into stack.
- SP is again decremented and the contents of low-order registers (C, E, L, Flags) are copied into stack.
- Example: PUSH B



- The contents of top of stack are copied into register pair.
- The contents of location pointed out by SP are copied to the low-order register (C, E, L, Flags).
- SP is incremented and the contents of location are copied to the high-order register (B, D, H, A).
- Example: POP H

Opcode	Operand	Description
OUT	8-bit port address	Copy data from accumulator to a port with 8- bit address

- The contents of accumulator are copied into the I/O port.
- Example: OUT 78 H

Opcode	Operand	Description
IN	8-bit port address	Copy data to accumulator from a port with 8- bit address

- The contents of I/O port are copied into accumulator.
- Example: IN 8C H