Microprocessor & Interfacing Lecture 6 8085 Instruction Set--1

PARUL BANSAL ASST PROFESSOR ECS DEPARTMENT DRONACHARYA COLLEGE OF ENGINEERING

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#### 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**

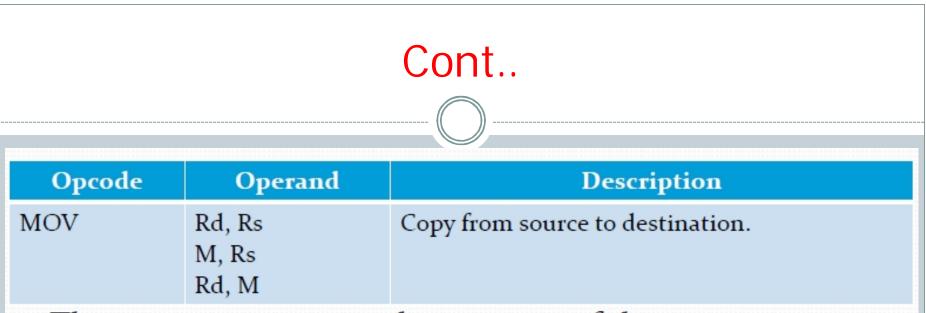
- An instruction is a binary pattern designed inside a microprocessor to perform a specific function.
- The entire group of instructions that a microprocessor supports is called Instruction Set.
- 8085 has 246 instructions.
- Each instruction is represented by an 8-bit binary value.
- These 8-bits of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

## **Classification of Instruction Set**

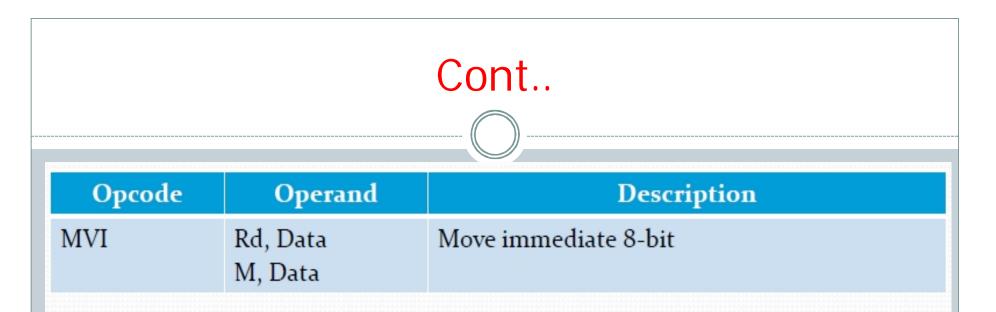
- Data Transfer Instruction
- Arithmetic Instructions
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- Branching Instructions
- Control Instructions

#### Data Transfer Instruction

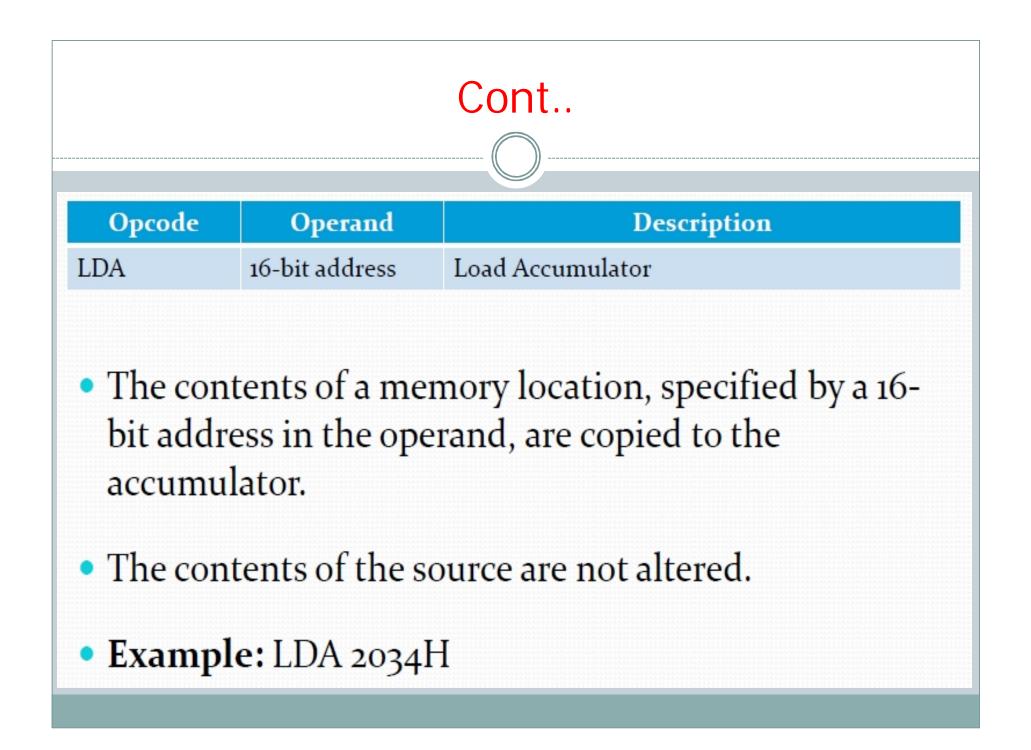
- These instructions move data between registers, or between memory and registers.
- These instructions copy data from source to destination.
- While copying, the contents of source are not modified.

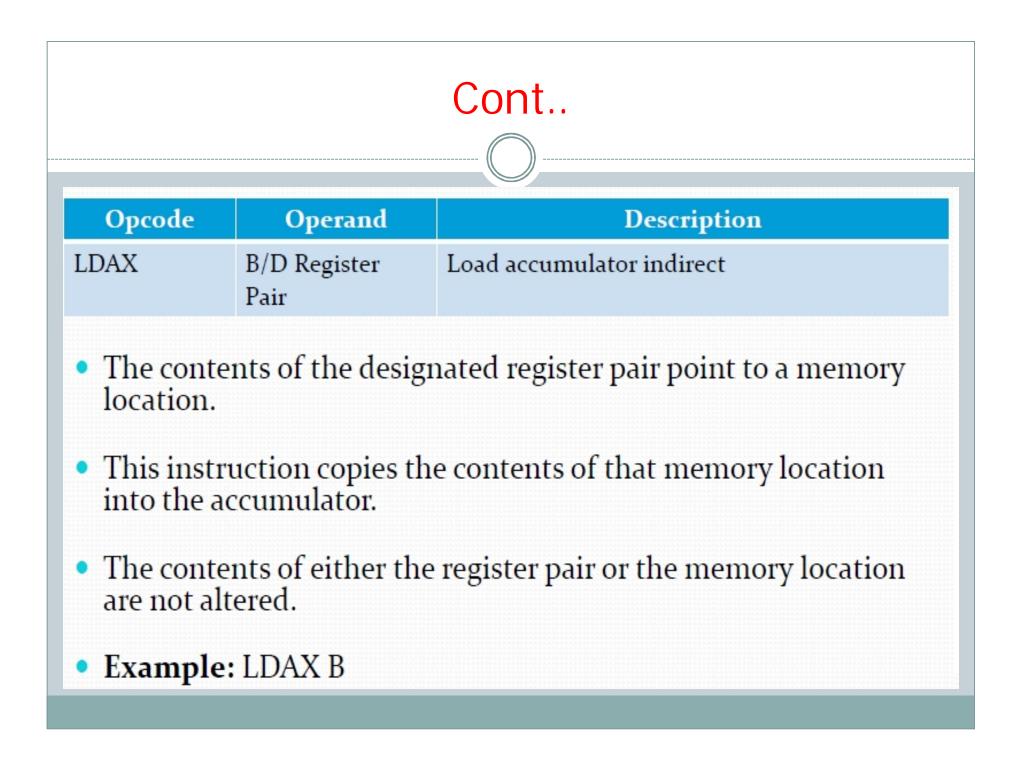


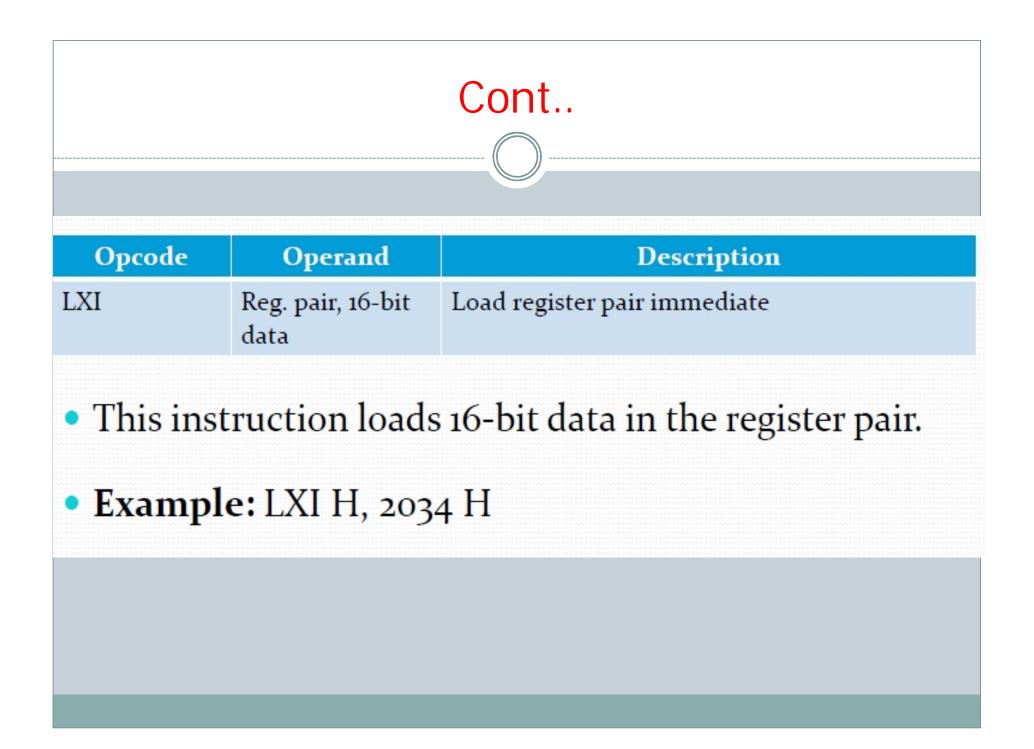
- This instruction copies the contents of the source register into the destination register.
- The contents of the source register are not altered.
- If one of the operands is a memory location, its location is specified by the contents of the HL registers.
- Example: MOV B, C or MOV B, M

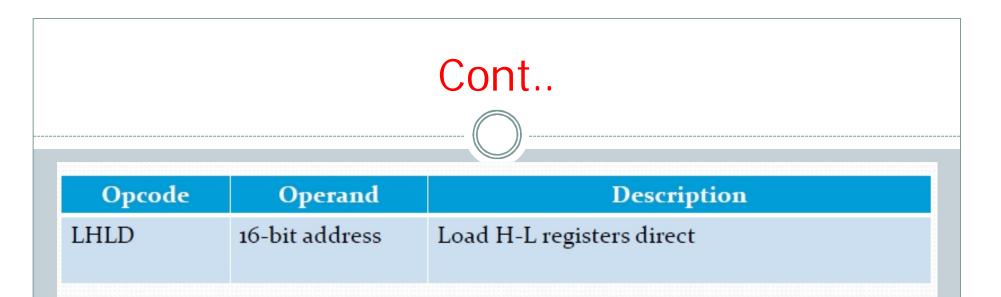


- The 8-bit data is stored in the destination register or memory.
- If the operand is a memory location, its location is specified by the contents of the H-L registers.
- Example: MVI B, 57H or MVI M, 57H

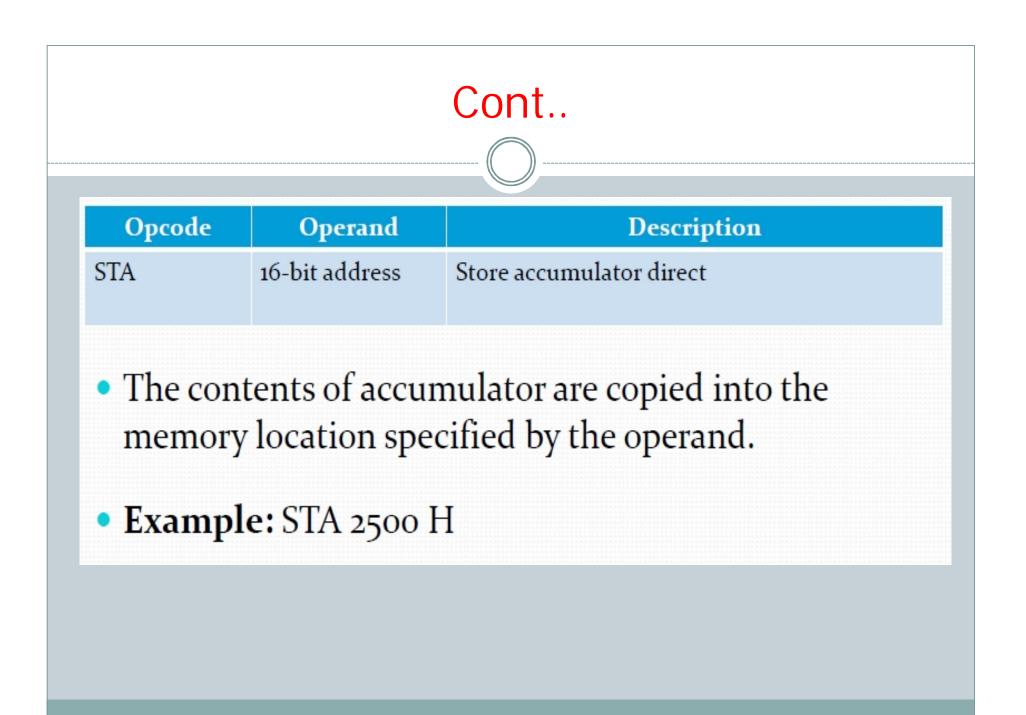


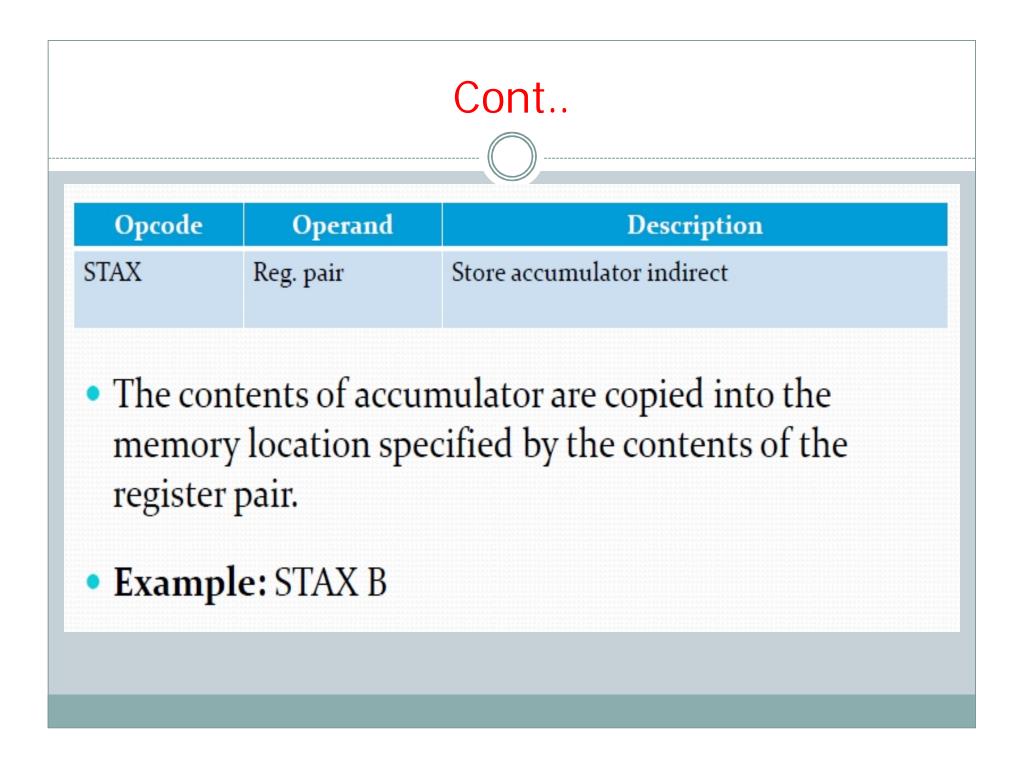


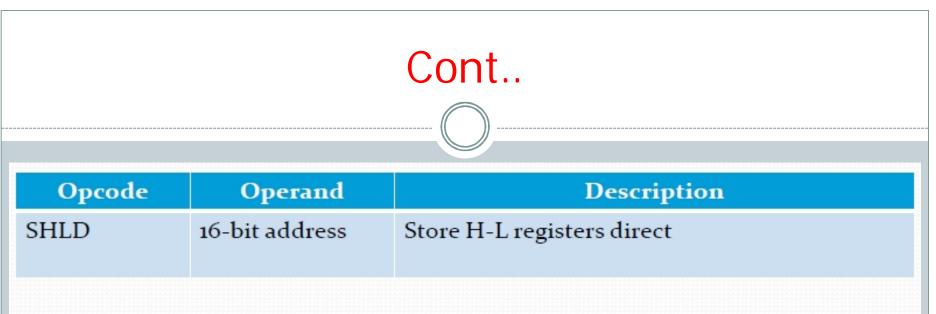




- This instruction copies the contents of memory location pointed out by 16-bit address into register L.
- It copies the contents of next memory location into register H.
- Example: LHLD 2040 H



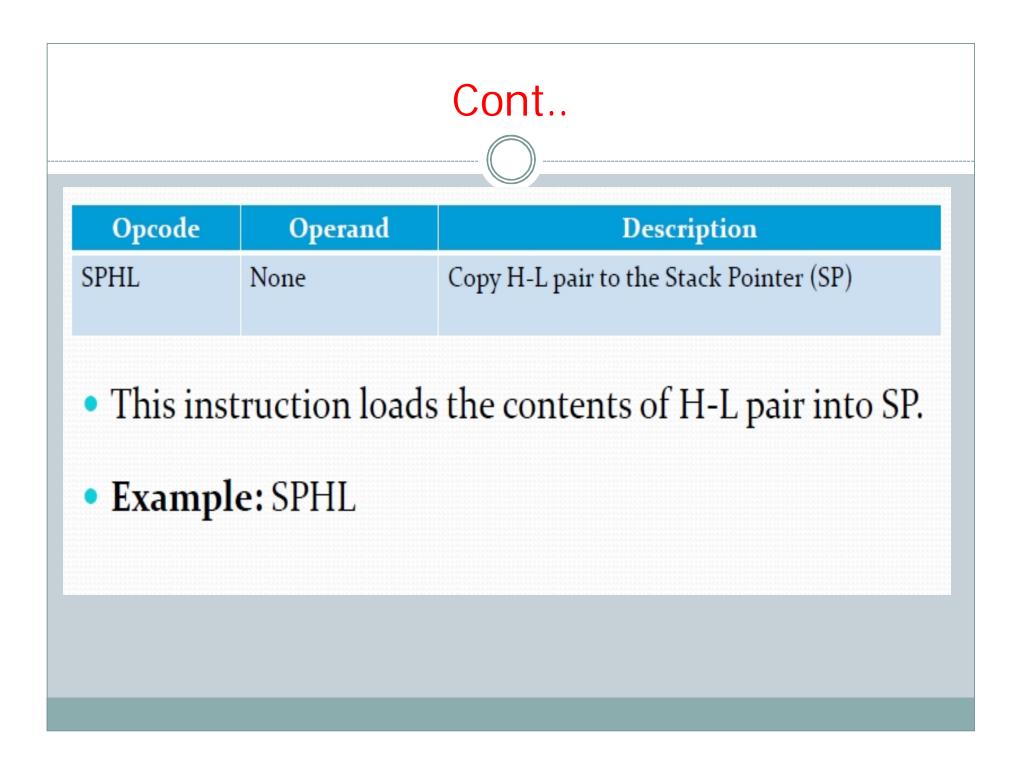


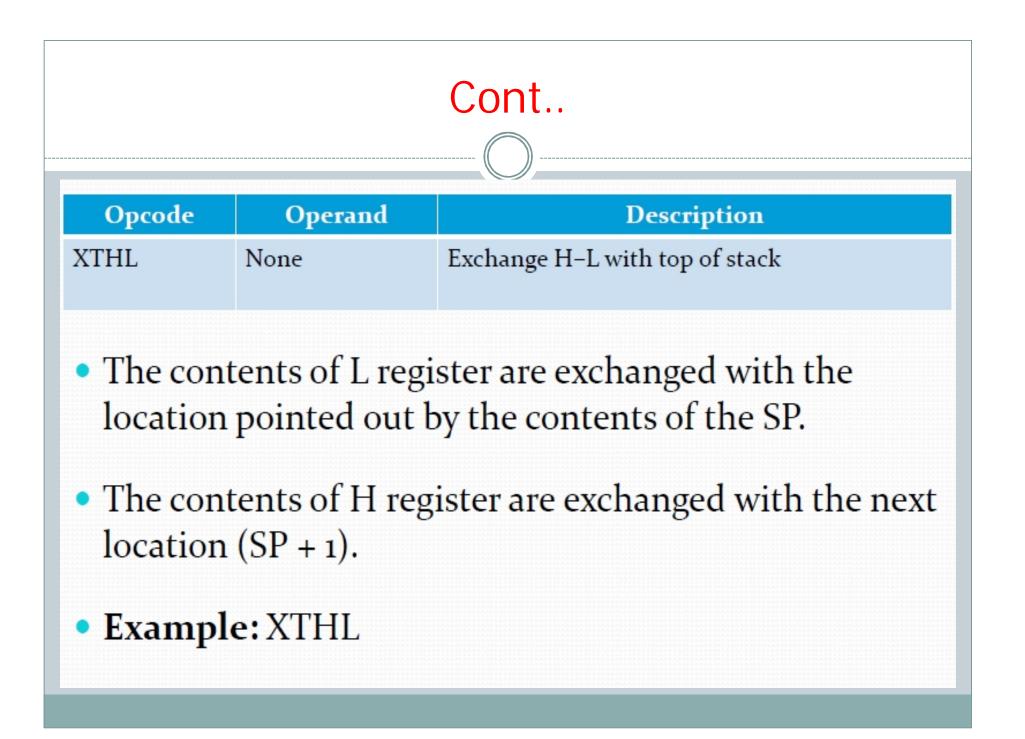


- The contents of register L are stored into memory location specified by the 16-bit address.
- The contents of register H are stored into the next memory location.
- Example: SHLD 2550 H

Cont				
Opcode	Operand	Description		
XCHG	None	Exchange H-L with D-E		
<ul> <li>The contents of register H are exchanged with the contents of register D.</li> </ul>				
<ul> <li>The contents of register L are exchanged with the contents of register E.</li> </ul>				

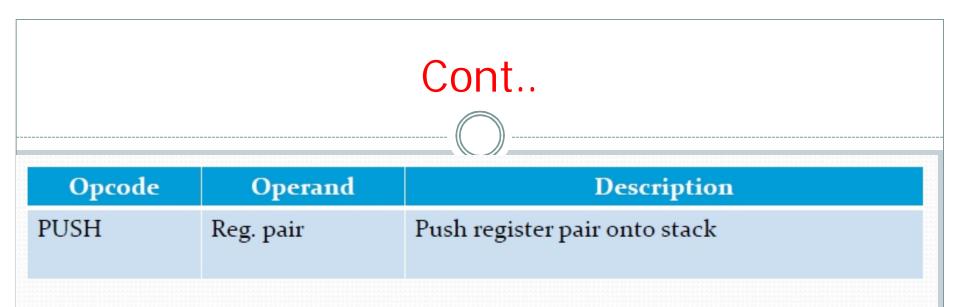
• Example: XCHG



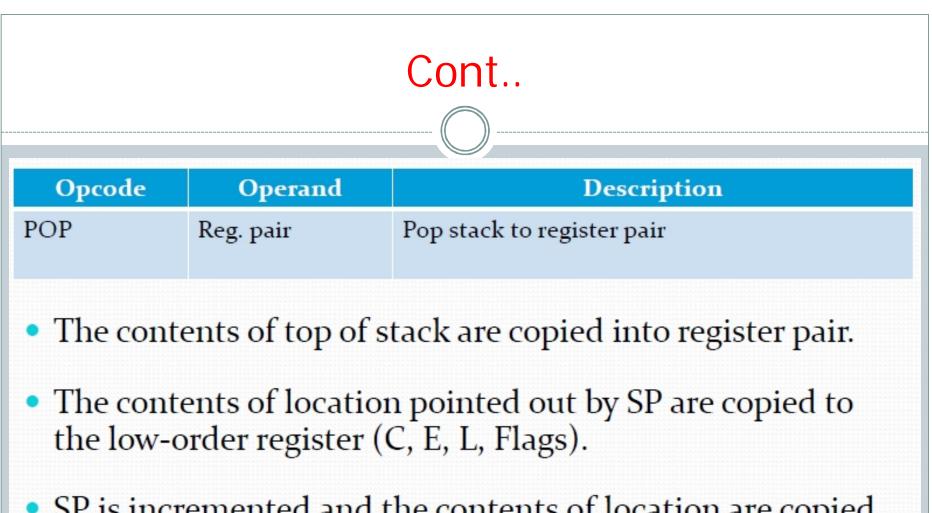


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Opcode	Operand	Description		
PCHL	None	Load program counter with H-L contents		

- 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



- 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

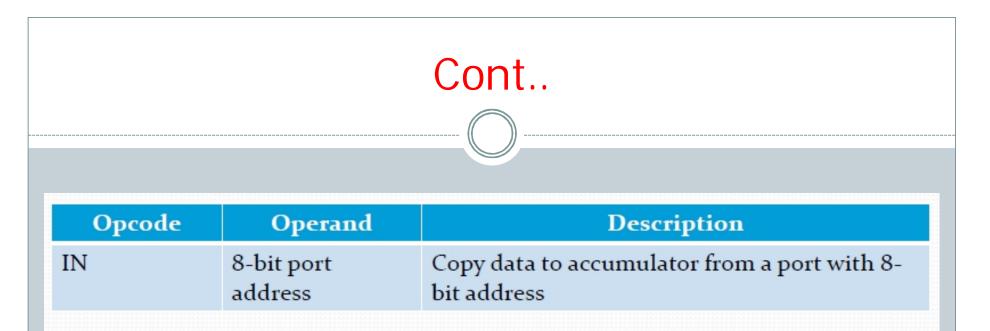


- SP is incremented and the contents of location are copied to the high-order register (B, D, H, A).
- Example: POP H

Cont				
Opcode	Operand	Description		
OUT	8-bit port address	Copy data from accumulator to a port with 8- bit address		
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The contents of accumulator are copied into the I/O port.

• Example: OUT 78 H



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