

Instruction Set of 8086 MP



Classification of instruction set:

- ☐ Data transfer instructions.
- ☐ Arithmetic instructions.
- ☐ Bit manipulation instructions.
- ☐ String instructions.
- ☐ Program transfer instructions.
- ☐ Processor control instructions.

Data transfer instructions

MOV instruction

Syntax OF MOV

MOV dest, source ; Copy content of source to dest(operand2 to operand1)

Data transfer instructions



Operand types:

REGISTERS:

AX, BX, CX, DX, AH, AL, BL, BH, CH, CL, DH, DL, DI, SI, BP, SP.

SEGMENT REGISTER :

DS, ES, SS, CS.

MEM: [Direct address], [BX], [SI], [BX+SI+7],[BP], etc.

immediate: 5, -24, 3Fh, 10001101b, etc...

both operands must have the same size.

Data transfer instructions

Formulas allowed

MOV REG1,REG2

MOV MEM,REG1

MOV REG1,MEM

MOV REG1/MEM,IMM

MOV SEGR,REG₁₆/MEM

MOV MEM/REG₁₆,SEGR

Data transfer instructions



EX:

```
MOV  BX,AX  MOV  DH,CL
MOV  [4000],DX
MOV  CL,[SI]
MOV  BL,40h
MOV  CX,044FFH
MOV  BYTEPTR [3000],55
MOV  WORDPTR [SI],EDAB
MOV  DS,AX
MOV  SS,[DI]
MOV  CX,ES
MOV  [BX+22],DS
```

REG1 ← REG2

MEM ← REG1

REG1 ← MEM

REG1 ← IMM

MEM ← IMM

SEGR ← REG₁₆

SEGR ← MEM

REG₁₆ ← SEGR

MEM ← SEGR

Data transfer instructions



ILLEGAL INSTRUCTIONS

```
MOV  SEGR,IMM  
MOV  SEGR,SEGR  
MOV  MEM,MEM
```

Ex: Write program in assembly language to exchange the content of AX register with CX.

```
MOV  BX,AX  
MOV  AX,CX  
MOV  CX,BX
```

Ex: Write program in assembly language to exchange the content of memory location (2400) with memory location (5000).size of memory one byte.

```
MOV  CL,[2400]  
MOV  DL,[5000]  
MOV  [5000],CL  
MOV  [2400],DL
```

Data transfer instructions



Exchange (XCHG) instruction

Syntax of XCHG

XCHG OPER1,OPER2 ;Exchange the content of oper1 with oper2

Formulas allowed

XCHG REG1,REG2

XCHG REG1,MEM

XCHG MEM,REG1

Ex: Exchange the content of AX with CX

XCHG AX,CX

Ex: Write program in assembly language to exchange the content of memory location (2400) with memory location (5000).size of memory one byte.(note without use mov instruction)

XCHG AX,[2400]

XCHG [5000],AX

XCHG [2400],AX

Instruction Set of 8086 MP



3. Load effective address (LEA) instruction

Syntax of LEA

LEA REG_{16} , Effective address ; load REG_{16} with offset address
 $\searrow$ EA

Ex:

LEA SI,[3F0D]

LET:
BX=2000 DI=1000

SI=3F0D LEA SI,[BX+DI+05]

EA=DI+BX+05=1000+2000+05=3005

SI=3005

Data transfer instructions

4. Load REG_{16} and DS (LDS) instruction

Syntax of LDS

LDS $REG_{16},(EA)$; $REG_{16} \leftarrow \text{content of } (EA)$
DS $\leftarrow \text{content of } (EA+2)$ } 4 BYTE (DOUBLE WORD)_TRANSFER

Ex:

```
LDS BX,[1000]
BX=2211
DS=C24E
```

	:
DS:1000	11
DS:1001	22
DS:1002	4E
DS:1003	C2
	:

Ex: Write an alternative program for previous instruction.

```
MOV BX,[1000]
MOV DS,[1002]
```