

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 4.
ASSEMBLY PROGRAMMING LANGUAGE LABORATORY
PROBLEM SHEET 1

Context: 8086 Emulator Practice

Data transfer instructions I

Step 1	Using emu8086 to assemble the instructions (a) MOV AX, BX (b) MOV AX, 0AAAAh (c) MOV AX, [BX] (d) MOV AX, [4] (e) MOV AX, [BX+SI] (f) MOV AX, [SI+4] (g) MOV AX, [BX+SI+4]
Step 2	Initializing the internal registers of the 80x86 as follows: (AX) = 0000H (BX) = 0001H (CX) = 0002H (DX) = 0003H (SI) = 0010H (DI) = 0020H (BP) = 0030H (DS) = 0B60H <u>Verify the initialization by displaying the new content of registers</u>
Step 3	Fill all memory locations in the range DS:00 through DS:1F with 00H and then initialize the following storage locations: (DS:0001H) = BBBBH (DS:0004H) = CCCCH (DS:0011H) = DDDDH (DS:0014H) = EEEEEH (DS:0016H) = FFFFH
Step 4	Trace the execution of the instructions (a) through (g). Explain the execution of each instruction, including addressing mode, physical address for memory addressing mode, value in AX. Fill the table below.

Instruction	Addressing Mode	Physical Address	AX	Function
a				
b				
c				
d				
e				
f				
g				

Data transfer instructions II

Step 1	Assemble the instruction MOV SI, [0ABCh] to memory at address CS:100 and verify loading of the instruction. How many bytes does the instruction take up?
Step 2	Initialize the word of memory starting at DS:0ABC with the value FFFFH , and DS register to 0B60H
Step 3	Clear the SI register, verify by displaying its content.
Step 4	Trace the execution. Describe the operation performed by the instruction.
Step 5	Assemble the instruction MOV WORD PTR [SI], ABCD into memory at Address CS: 100 and then verify loading of the instruction. How many bytes does it take?
Step 6	Initialize SI register with the value 0ABCH
Step 7	Clear the word of memory starting at DS:0ABC
Step 8	Trace the execution. Describe the operation performed by the instruction.

Step 4 trace
Step 8 trace

Arithmetic instructions

Step 1	Assemble the instruction ADC AX, [0ABC] to memory at address CS:100 and verify loading of the instruction. How many bytes does the instruction take up?
Step 2	Initialize the word of memory starting at DS:0ABC with the value FFFFH, and DS register to 0B60H
Step 3	Initialize AX with the value 0001H. Verify by displaying register contents.
Step 4	Clear the carry flag
Step 5	Trace the execution. Describe the operation performed by the instruction and what happened to the carry flag?

Step 5 trace

Step 1	<p>Assemble the following instruction sequence into memory at address CS:100 and then verify loading of the instruction. How many bytes do they take?</p> <p>.....</p> <p>(a) LAHF (b) MOV BH, AH (c) AND BH, 1FH (d) AND AH, 0E0H (e) MOV [200H], BH (f) SAHF</p>
Step 2	Initialize DS register to 0B60H and the byte of memory starting at DS:200H with the value 00H
Step 3	Clear register AX and BX
Step 4	Display the current state of flags, make sure the status flags equal NG, ZR, AC, PE and CY
Step 5	Trace the execution. Describe the operation performed by each instruction. What value is read out of the flags register? What value is saved in memory? What value is reloaded into flags register?

Instruction	Flags before execution	Memory address affected	Memory contents	Flags after execution	Function
a					
b					
c					
d					
e					
f					