Experiment 5
Shift and Rotate operation

5.1 Aim(s) / Objective(s) / Purpose.

The purpose of this experiment is to learn Rotate and Shift commands in assembly language.

5.2 Hardware Requirement:

The 8086 Microprocessor kit, Power Supply.

5.3 Program Logic:

Addressing the string is done using the SI register, and the BL register is used to store the number of positive numbers, BH register is used to store the number of negative numbers. Hence each data is fetched from memory and is shifted left by one position. If the carry flag is set, then it denotes negative number, else positive number. The inputs from 00H to 7FH are positive numbers and 80H to FFH are negative numbers.

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5.4 Program:

ADDRESS	LABEL	MNEMONICS	OPCODE	COMMENTS
		MOV BL,00H ;		
		MOV BH,00H;		
		MOV SI,1100H;		
		MOV CL,01H;		
		MOV CH,[SI];		
		INC SI;		
	LOOP:	MOV AL,[SI];		
		SHL AL,CL;		
		JC NEGATIVE;		
		INC BL;		
		JMP NEXT;		
	NEGATIVE:	INC BH;		
	NEXT:	ADD SI,01H;		
		DEC CH;		
		JNZ LOOP;		
		MOV [1200],BL;		
		MOV[1201],BH;		
		HLT		

Observation

INPUT ADDRESS	DATA
1100	
1101	
1102	
1103	
1104	
1105	

OUTPUT ADDRESS	DATA
1200	
1201	

5.5 Pre Lab Questions

1. Explain the SHR, SAR, SHL, SAL, ROL, ROR, RCL, RCR instruction with neat diagrams.
2. Find out the answer for a given program?

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MOV CL,04H ;
MOV AX,564AH ;
SAL AX,CL ;
RET
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5.6 Post Lab Questions

1. Simulate the above lab experiment program in emulator 8086 software
2. Find out the answer for the pre lab Question 2 with ROR and RCR instead of SAL?

5.7 Results and Conclusion

Thus, the instruction sets, addressing modes and to perform shift and rotate operation by given number of bits in the memory was experimented.