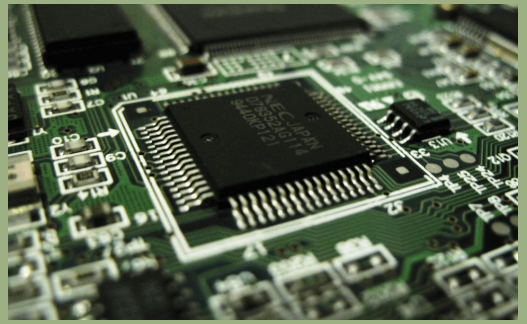

8085 Microprocessor

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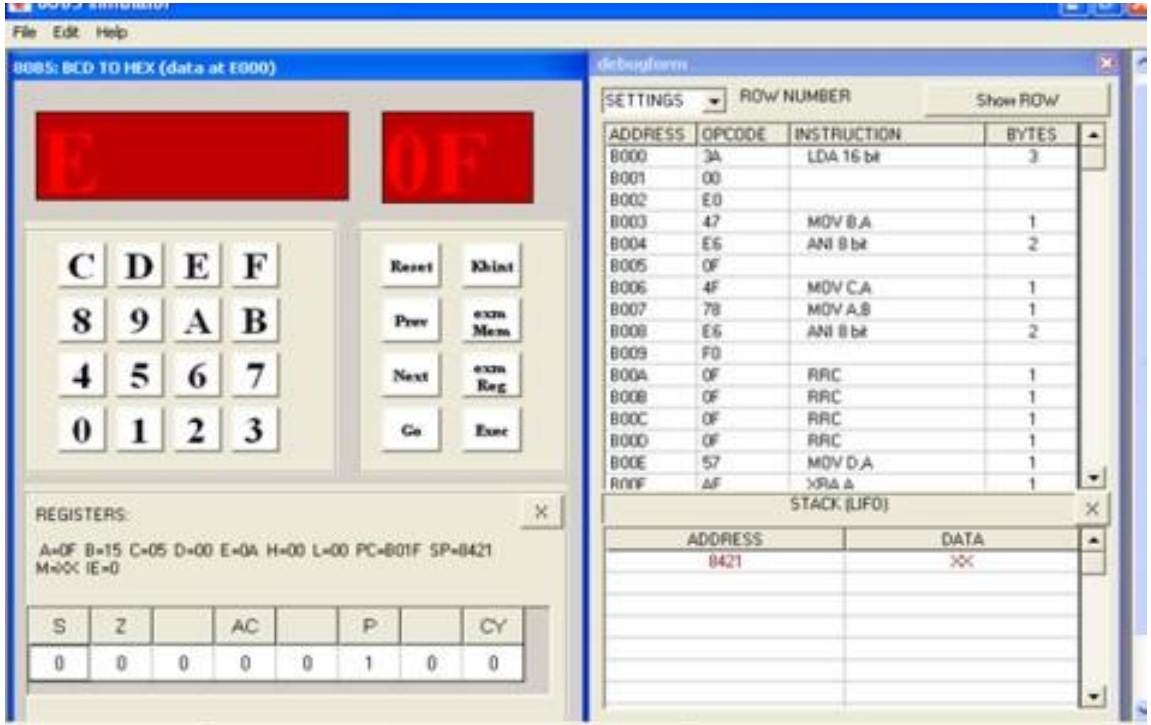
LAB ASSIGNMENT (8085)

1. Introduction of 8085-microprocessor kit and steps for execution on the kit.
2. Familiarity with 8085-microprocessor kit.
   - i) Write a program to store 8-bit data into one register and then copy that to all registers.
   - ii) Write a program for addition of two 8-bit numbers.
   - iii) Write a program to add 8-bit numbers using direct and indirect addressing mode.
   - iv) Write a program to add 16-bit numbers using direct and indirect addressing mode.
   - v) Write a program to 8-bit numbers using carry. (using JNC instruction).
   - vi) Write a program to find 1's complement and 2's complement of 8-bit number.
3. Write a program for the sum of series of numbers.
4. Write a program for data transfer from memory block B1 to memory block B2.
5. Write a program for multiply two 8-bit numbers.
6. Write a program to add ten 8-bit numbers. Assume the numbers are stored in 8500-8509. Store the result in 850A and 850B memory address.
7. Write a program to find the negative numbers in a block of data.
8. Write a program to count the number of one's in a number.
9. Write a program to arrange numbers in Ascending order.
10. Calculate the sum of series of even numbers.
11. Write an assembly language program to verify how many bytes are present in a given set, which resembles 10101101 in 8085.
12. Write an assembly language program to find the numbers of even parity in ten consecutive memory locations in 8085.
13. Write an assembly language program to convert a BCD number into its equivalent binary in 8085.
14. Write an assembly language program for exchange the contents of memory location.
15. Write a program to find the largest number in an array of 10 elements.

Steps to perform on the Intel kit as well as on Simulator

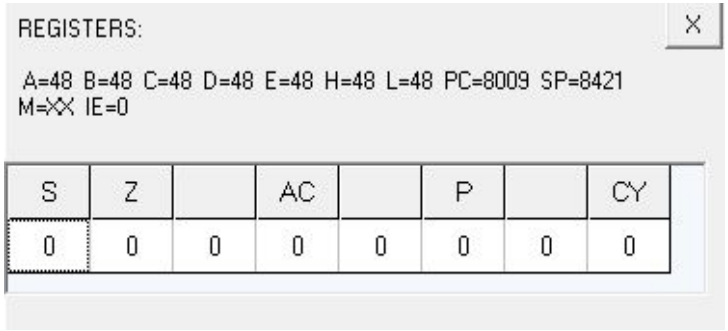
- Press Reset
- Press Examine Memory
- Enter starting address
- Press Next
- Enter opcodes by subsequently pressing Next
- Press Reset
- Press Go
- Enter starting address of the program to compile
- Press EXEC/FILL
- Press Reset
- Press Examine Memory
- Enter Output Address
- Press Next

Vikas Simulator Screenshot



Program No. 2.1: Write a program to store 8-bit data into one register and then copy that to all registers.

Code	Memory Location	Opcode
MVI A, 48	8000, 8001	3E, 48
MOV B, A	8002	47
MOV C, A	8003	4F
MOV D, A	8004	57
MOV E, A	8005	5F
MOV H, A	8006	67
MOV L, A	8007	6F
RST 5	8008	EF



Output –

A – 48, B – 48, C – 48, D – 48, E – 48, H – 48, L – 48

Program No. 2.2: Write a program for addition of two 8-bit numbers.

Code	Memory Location	Opcode
MVI A, 48	8000, 8001	3E, 48
MVI B, 48	8002, 8003	06, 48
ADD B	8004	80
STA 8500	8005, 8006, 8007	32, 00, 85
RST 5	8008	EF

Output –

[8500] – 90

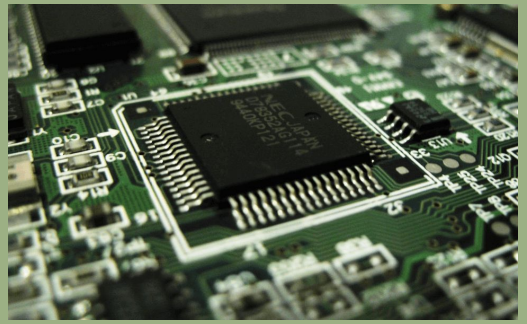
Program No. 2.3: Write a program to add 8-bit numbers using direct and indirect addressing mode.

Code	Memory Location	Opcode
LDA 8500	8000, 8001, 8002	3A, 00, 85
MOV B, A	8003	47
LDA 8501	8004, 8005, 8006	3A, 01, 85
ADD B	8007	80
STA 8502	8008, 8009, 800A	32, 02, 85
RST 5	800B	EF

Input - [8500] – 88, [8501] – 88
Output - [8502] – 10

Code	Memory Location	Opcode
LXI H, 8500	8000, 8001, 8002	21, 00, 85
MOV A, M	8003	7E
INX H	8004	23
ADD M	8005	86
INX H	8006	23
MOV M, A	8007	77
RST 5	8008	EF

Input - [8500] – 88, [8501] – 88
Output – A – 10



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Program No. 2.4: Write a program to add 16-bit numbers using direct and indirect addressing mode.

Code	Memory Location	Opcode
LHLD 8500	8000, 8001, 8002	2A, 00, 85
XCHG	8003	EB
LHLD 8502	8004, 8005, 8006	2A, 02, 85
DAD D	8007	19
SHLD 8504	8008, 8009, 800A	22, 04, 85
RST 5	800B	EF

Input - [8500] – 48, [8501] – 48, [8502] – 48, [8503] – 48
Output - [8504] – 90, [8505] – 90

Code	Memory Location	Opcode
LXI B, 8500	8000, 8001, 8002	01, 00, 85
LDAX B	8003	0A
MOV D, A	8004	57
INX B	8005	03
LDAX B	8006	0A
ADD D	8007	82
STA 8504	8008, 8009, 800A	32, 04, 85
INX B	800B	03
LDAX B	800C	0A
MOV D, A	800D	57
INX B	800E	03
LDAX B	800F	0A
ADC D	8010	8A
STA 8505	8011, 8012, 8013	32, 05, 85
RST 5	8014	EF

Input - [8500] – 34, [8501] – 48, [8502] – 54, [8503] – 78
Output – [8504] – 7C [8505] – CC

Program No. 2.5: Write a program to add 8-bit numbers using carry. (using JNC instruction).

Code
MVI C, 00
LXI H, 8500
MOV A, M
INX H
ADD M
JNC Next
INR C
INX H
Next: MOV M, A
INX H
MOV M, C
RST 5

Input - [8500] – 88, [8501] – 88
Output - [8502] – 10, [8503] – 01

Program No. 2.6: Write a program to find 1's complement and 2's complement of a 8-bit number.

Code
LDA 8500H
CMA
STA 8501H
RST 5

Input - [8500] – 48
Output - [8501] – B7

Code
LDA 8500H
CMA
INR A
STA 8501H
RST 5

Input - [8500] – 48
Output - [8501] – B8

Program No. 3: Write a program for the sum of series of numbers.

Code
LDA 8500H
MOV C, A
SUB A
LXI H, 8501H
Back: ADD M
INX H
DCR C
JNZ Back
STA 8600H
RST 5

Input - [8500] – 04, [8501] – 9A, [8502] – 52, [8503] – 89, [8504] – 3E

Result – 1B3 **Output -** [8600] – B3

Program No. 4: Write a program for data transfer from memory block B1 to memory block B2.

Code
MVI C, 0AH
LXI H, 8500H
LXI D, 8600H
Back: MOV A, M
STAX D
INX H
INX D
DCR C
JNZ Back
RST 5

Input - [8500] – 01, [8501] – 02, [8502] – 03,…… [8509] – 0A

Output - [8600] – 01, [8601] – 02, [8602] – 03,…… [8609] – 0A

Program No. 5: Write a program for multiply two 8-bit numbers.

Code
LDA 8500H
MOV E, A
MVI D, 00
LDA 8501H
MOV C, A
LXI H, 0000H
Back: DAD D
DCR C
JNZ Back
SHLD 8600H
RST 5

Input - [8500] – B2, [8501] – 03

Result – B2 + B2 + B2 = 0216 H **Output -** [8600] – 16, [8601] – 02

Program No. 14: Write an ALP for exchange the contents of memory location.

Code
LDA 8500H
MOV B, A
LDA 8600H
STA 8500H
MOV A, B
STA 8600H
RST 5

Input - [8500] – 48, [8600] – 88
Output - [8500] – 88, [8600] – 48

Program No. 15: Write a program to find the largest number in an array of 10 elements.

Code
MVI B, 09
LXI H, 8500H
MOV A, M
INX H
Back: CMP M
JNC Next
MOV A, M
Next: INX H
DCR B
JNZ Back
STA 850AH
RST 5

Input - [8500] – 01, [8501] – 02, ... [8509] – 0A
Output - [850A] – 0A

Program No. 6: Write a program to add ten 8-bit numbers. Assume the numbers are stored in 8500-8509. Store the result in 850A and 850B memory address.

Code
MVI C, 00
MVI B, 09
LXI H, 8500H
MOV A, M
Back: INX H
ADD M
JNC Next
INR C
Next: DCR B
JNZ Back
INX H
MOV M, A
INX H
MOV M, C
RST 5

Input - [8500] – FF, [8501] – 01, [8502] – 01, [8503] – 01, [8504] – 01, [8505] – 01, [8506] – 01, [8507] – 01, [8508] – 01, [8509] – 01

Output - [850A] – 08, [850B] – 01

Program No. 7: Write a program to find the negative numbers in a block of data.

Code
LDA 8500H
MOV C, A
MVI B, 00
LXI H, 8501H
Back: MOV A, M
ANI 80H
JZ Skip
INR B
Skip: INX H
DCR C
JNZ Back
MOV A, B
STA 8600H
RST 5

Input - [8500] – 04, [8501] – 56, [8502] – A9, [8503] – 73, [8504] – 82

Result = 02 **Output -** [8600] – 02

Program No. 8: Write a program to count the number of one's in a number.

Code
LDA 8500H
MVI B, 08
MVI D, 00
Loop1: RLC
JNC Loop2
INR D
Loop2: DCR B
JNZ Loop1
MOV A, D
STA 8600H
RST 5

Input - [8500] – 25 0010 0101
Output - [8600] – 03

Program No. 9: Write a program to arrange numbers in Ascending order.

Code
LXI H, 8500H
MOV C, M
DCR C
Repeat: MOV D, C
LXI H, 8501H
Loop: MOV A, M
INX H
CMP M
JC Skip

MOV B, M
MOV M , A
DCX H
MOV M, B
INX H
Skip: DCR D
JNZ Loop
DCR C
JNZ Repeat
RST5

Input - [8500] – 05, [8501] – 05, [8502] – 04, [8503] – 03, [8504] – 02, [8505] – 01
Input - [8500] – 05, [8501] – 01, [8502] – 02, [8503] – 03, [8504] – 04, [8505] – 05

Program No. 10: Write a program to calculate the sum of series of even numbers.

Code
LDA 8500H
MOV C, A
MVI B, 00
LXI H, 8501H
Back: MOV A, M
ANI 01
JNZ Skip
MOV A, B
ADD M
MOV B, A
Skip: INX H
DCR C
JNZ Back
STA 8600H
RST 5

Input - [8500] – 04, [8501] – 20, [8502] – 15 , [8503] – 13, [8504] – 22

Output - [8600] – 42

Program No. 11: Write an assembly language program to verify how many bytes are present in a given set, which resembles 10101101 in 8085.

Code
MVI B, 0A
MVI D, AD
MVI C, 00
LXI H, 8500H
Back: MOV A, M
CMP D
JNZ Next
INR C
Next: INX H
DCR B
JNZ Back
MOV A, C
STA 8600H
RST 5

Input - [8500] – AD, [8501] – 01, [8502] – 01, [8503] – 01, [8504] – 01, [8505] – 01, [8506] – 01, [8507] – 01, [8508] – 01, [8509] – 01

Output - [8600] – 01

Program No. 12: Write an assembly language program to find the numbers of even parity in ten consecutive memory locations in 8085.

Code
MVI B, 0A
MVI C, 00
LXI H, 8500H
Back: MOV A, M
ANI FF
JPO Next
INR C
Next: INX H
DCR B
JNZ Back
MOV A, C
STA 8600H
RST 5

Input - [8500] – 01, [8501] – 03, [8502] – 01, [8503] – 03, [8504] – 01, [8505] – 03, [8506] – 01, [8507] – 03, [8508] – 01, [8509] – 03

Output - [8600] – 05

Program No. 13: Write an assembly language program to convert a BCD number into its equivalent binary in 8085.

Code
LDA 8500H
MOV B, A
ANI 0F
MOV C, A
MOV A, B
ANI F0
RRC
RRC
RRC

RRC
MOV B, A
XRA A
MVI D, 0A
Sum: ADD D
DCR B
JNZ Sum
ADD C
STA 8600H
RST 5

Input - [8500] – 67
Input - [8600] – 43


Thank you!