

**Microprocessor Based Systems Design (UCS617)**  
**Lab Assignment (Intel 8085)**

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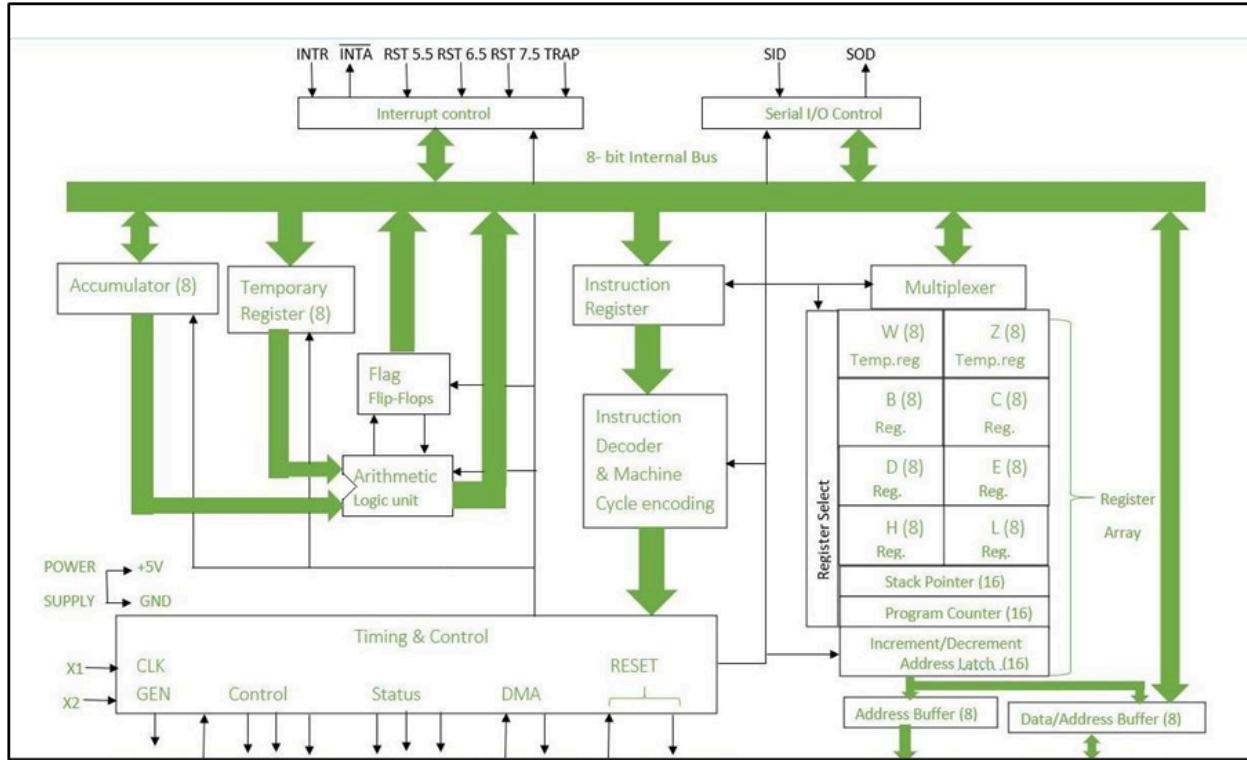
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## Program No. 1

**Aim:** Introduction of 8085-microprocessor kit and steps for execution on the kit.



### Introduction:

The Intel 8085 microprocessor, developed in the mid-1970s, marks a significant milestone in the evolution of personal computing. Renowned for its straightforward architecture and ease of use, it became a favorite among early computing enthusiasts and hobbyists. Let's delve into the core components that constitute the 8085 microprocessor's architecture:

- **Accumulator:** The heart of the arithmetic and logic operations, the accumulator also serves as a general-purpose register.
- **General-Purpose Registers:** Comprising six registers labeled B, C, D, E, H, and L. These can be paired to form three 16-bit register pairs: BC, DE, and HL, which are versatile in their usage, including storing memory addresses and data.
- **Program Counter (PC):** A crucial 16-bit register that points to the memory address of the next instruction to be executed. It automatically increments as instructions are processed, ensuring sequential execution of the program.

- **Stack Pointer (SP):** This 16-bit register plays a key role in managing the stack—a temporary data storage area. The SP tracks the stack's top, facilitating efficient data handling during subroutine calls and returns.
- **Instruction Register:** Holds the currently executing instruction. This 8-bit register is essential for the decoding and execution process within the microprocessor.
- **Flags Register:** An 8-bit register that holds the outcome flags of arithmetic and logical operations. Key flags include:
  - **Carry Flag:** Indicates an overflow from the most significant bit.
  - **Zero Flag:** Set if the result of an operation is zero.
  - **Sign Flag:** Reflects the sign of the result (positive or negative).
  - **Parity Flag:** Indicates whether the number of set bits is odd or even.
- **Data Bus, Address Bus, and Control Bus:** These buses facilitate data movement, addressing, and control signals between the microprocessor and other components.

### **Intel 8085 Microprocessor Features:**

- **Development:** Created by Intel, marking a significant advancement in microprocessor technology.
- **8-bit Microprocessor:** Capable of processing 8 bits of data simultaneously.
- **Power Supply:** Operates on a single +5V D.C. supply, simplifying the power design for systems.
- **Technology:** Utilizes NMOS technology for its design and functionality.
- **Transistor Count:** Contains 6200 transistors on a single chip, showcasing the complexity and compactness of the design.
- **Clock Generator:** Features an on-chip clock generator, eliminating the need for external clock sources.
- **Clock Frequency:** Functions at a 3MHz clock frequency, balancing speed and efficiency.
- **Address/Data Bus:** Employs an 8-bit multiplexed address/data bus, reducing the pin count for address and data communication.

- **Memory Addressing:** With 16 address lines, it can address up to 64KB ( $2^{16}$ ) of memory.
- **I/O Addressing:** Capable of generating 8-bit I/O addresses, allowing access to 256 ( $2^8$ ) I/O ports.
- **Hardware Interrupts:** Supports 5 hardware interrupts (TRAP, RST4.5, RST7.5, RST6.5, RST5.5, and INTR), facilitating efficient external event handling.
- **Direct Memory Access:** Provides DMA capability for faster data transfer between memory and devices.
- **Packaging:** Housed in a 40-pin IC package, fabricated on a single LSI chip for compactness and integration.
- **Clock Cycle:** Features a 320ns clock cycle, indicating the speed of operation and instruction execution.
- **Instruction Set:** Includes 80 basic instructions and 246 opcodes, offering a versatile programming and operational capability.

### **Special Key Functions:**

1. **The Reset key function** in Vikas Simulator serves a critical role in setting the program's execution state back to its initial conditions. Here's a detailed explanation of its functionality and significance:  
Function:

Pressing the Reset key essentially restarts the program simulation, simulating a power-on or system reset event. This action brings the program's execution environment back to its initial state, as defined when the program was loaded or last reset.

2. **The Kbint key function** in Vikas Simulator serves a specific purpose related to keyboard input simulation within the program execution. Here's a breakdown of its functionality and how it can be used:

Function:

Pressing the Kbint key opens a dialog box or prompt where you can enter a sequence of characters to be simulated as keyboard input for the program. This essentially injects the entered characters into the program's input stream.

3. **The Prev key function** in the Vikas Simulator serves the purpose of navigating backwards within the program's execution. Here's a detailed explanation of its functionality:

Function:

When pressed, the Prev key takes you one step back in the program's execution. This essentially means it reverses the execution of the most recently executed instruction.

4. **The exm Mem key function** in the Vikas Simulator allows users to inspect the contents of memory locations in a simulated environment.

Function:

The "exm Mem" function, short for "Examine Memory," allows users to inspect and analyze the contents of memory locations during program execution in the Vikas Simulator for the 8085 microprocessor.

5. **The Next key function** in Vikas Simulator plays a vital role in controlling the program execution, allowing you to move forward one step at a time. Here's a breakdown of its functionality and significance:

Function:

Pressing the Next key advances the program execution by one instruction. This essentially simulates the normal execution flow, where the processor fetches, decodes, and executes the next instruction in sequence.

6. **The exm Reg function** in Vikas Simulator allows users to inspect the contents of the various registers within the simulated microprocessor.

Function:

The "exm Reg" function, short for "Examine Register," allows users to inspect and analyze the contents of the various registers within the simulated 8085 microprocessor in Vikas Simulator.

7. **The Go key function** in Vikas Simulator serves a distinct purpose compared to the Prev and Next keys, focusing on continuous execution rather than step-by-step control. Here's a detailed explanation of its functionality:

Function:

Pressing the Go key initiates the uninterrupted execution of the entire program from the current point. Unlike the Next key, which advances one instruction at a time, the Go key allows the program to run without pausing until it reaches the end or encounters an error.

8. **The Exec key function** in Vikas Simulator holds a specific purpose within the program execution process. Here's a breakdown of its functionality and significance:

Function:

Pressing the Exec key directly executes the entire program from the beginning, similar to pressing the Go key. However, the key distinction lies in its behavior regarding breakpoints.

## Program No. 2 (i)

**Aim:** Write a program to store 8-bit data into one register and then copy that to all registers.

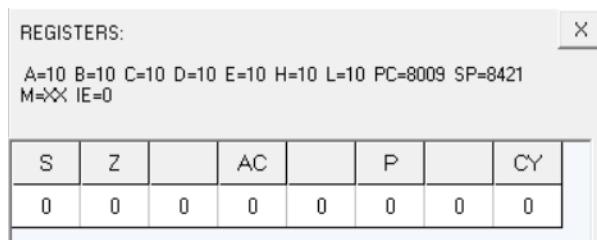
Code	Memory Location	Opcode
MVI A,10 H	8000, 8001	3E, 10
MOV B,A	8002	47
MOV C,A	8003	4F
MOV D,A	8004	57
MOV E,A	8005	5F
MOV H,A	8006	67
MOV L,A	8007	6F
RST 5	8008	EF

**Input :** [8001] – 10

**Output :**

Registers : [A] – 10, [B] – 10, [C] – 10, [D] – 10, [E] – 10, [H] – 10, [L] – 10

Flags: S – 0, Z – 0, AC – 0, P – 0, CY – 0



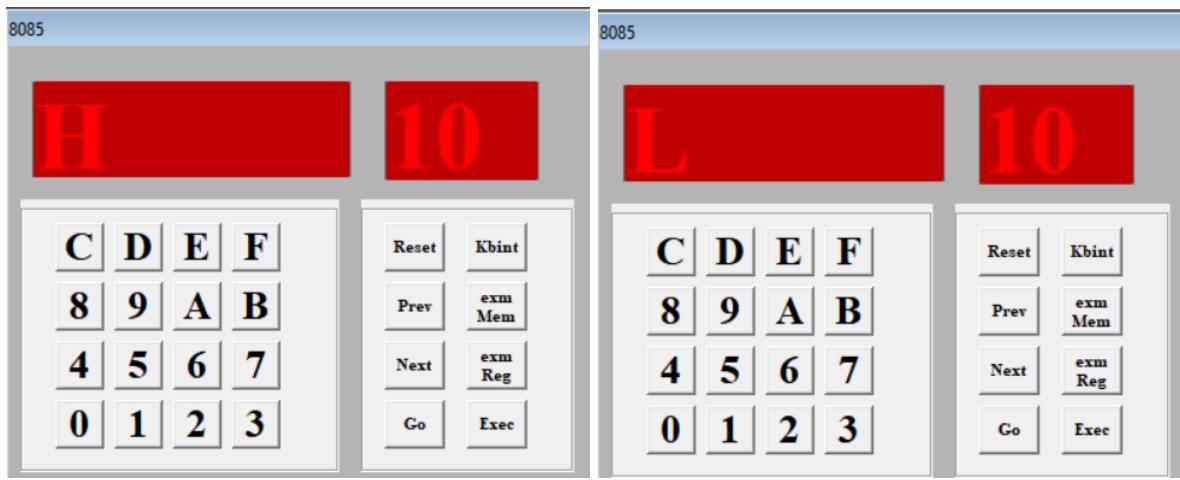
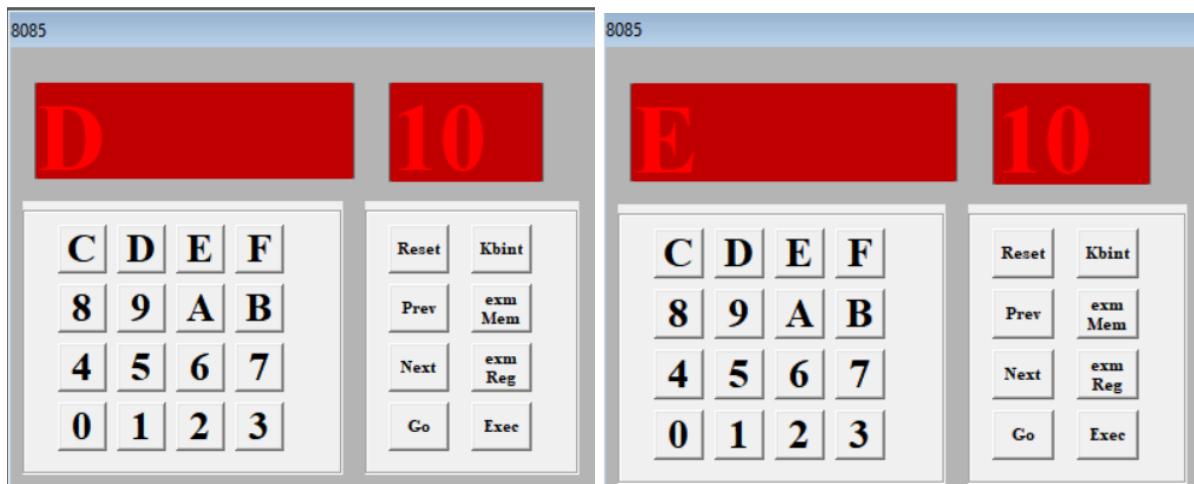
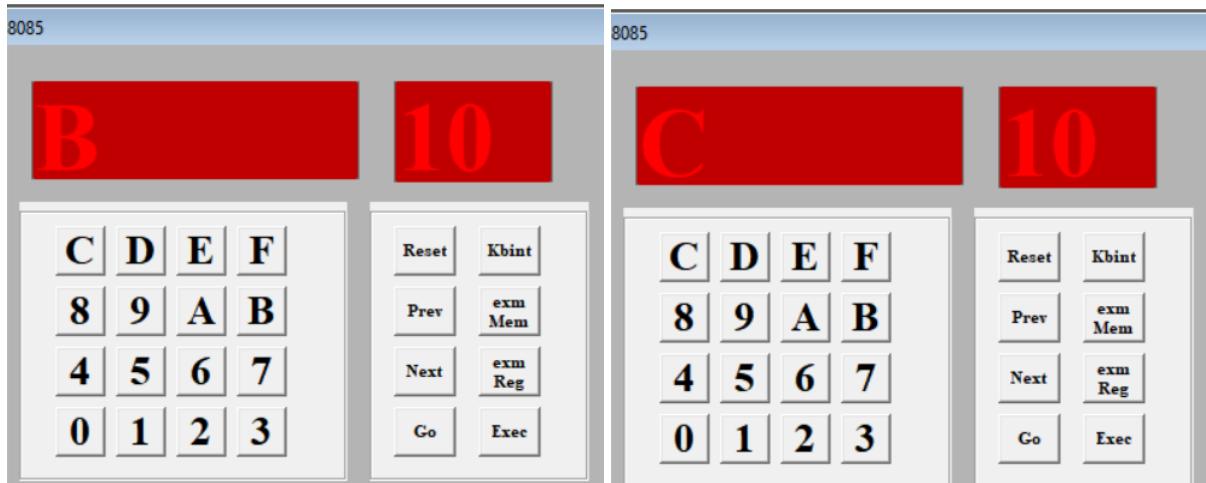
debugform

ROW NUMBER		Show ROW	
ADDRESS	OPCODE	INSTRUCTION	BYTES
8000	3E	MVI A,8 bit	2
8001	10		
8002	47	MOV B,A	1
8003	4F	MOV C,A	1
8004	57	MOV D,A	1
8005	5F	MOV E,A	1
8006	67	MOV H,A	1
8007	6F	MOV L,A	1
8008	EF	RST 5	1

STACK (LIFO)

ADDRESS	DATA
8421	<>





## Program No. 2 (ii)

**Aim:** Write a program for addition of two 8-bit numbers.

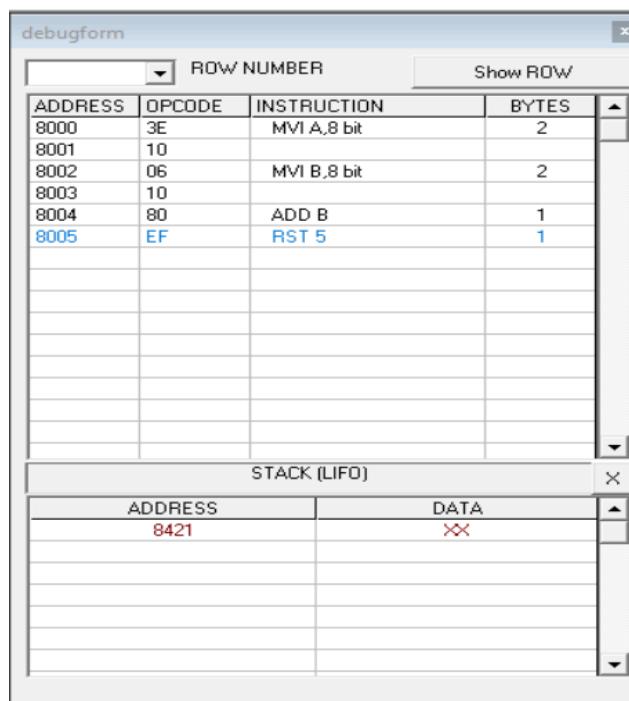
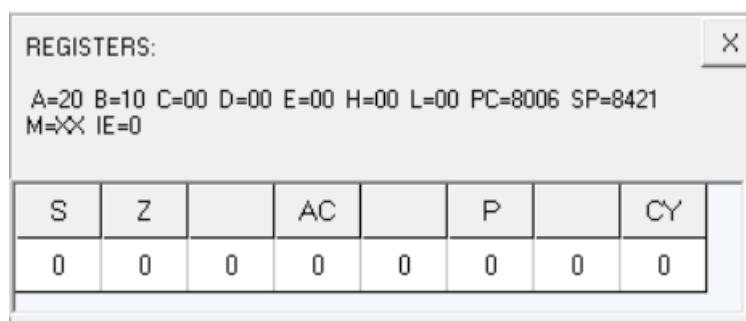
Code	Memory Location	Opcode
MVI A,10 H	8000, 8001	3E, 10
MVI B, 10 H	8002, 8003	06, 10
ADD B	8004	80
RST 5	8005	EF

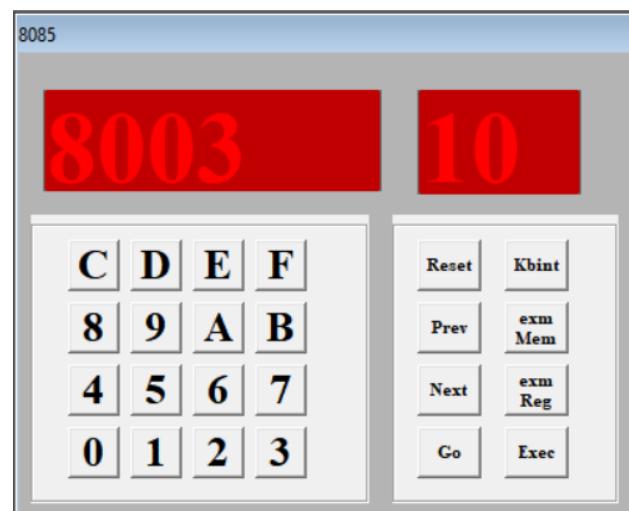
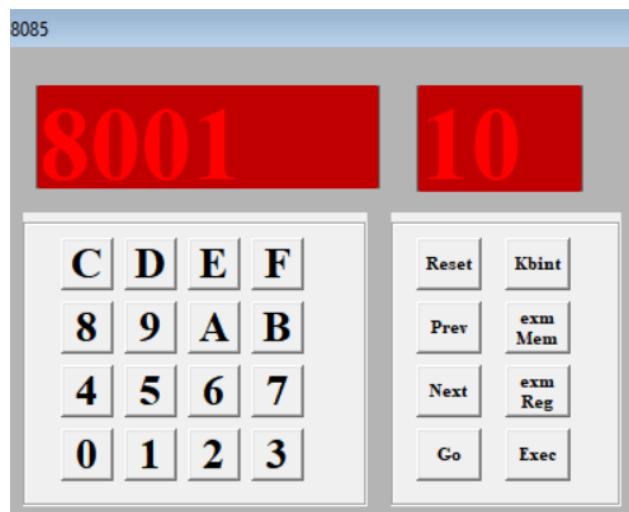
**Input :** [8001] – 10, [8002] – 10

**Output :**

Registers : [A] – 20

Flags: S – 0, Z – 0, AC – 0, P – 0, CY – 0





## Program No. 2 (iii)

**Aim:** Write a program to add 8-bit numbers using direct and indirect addressing mode

### Direct :

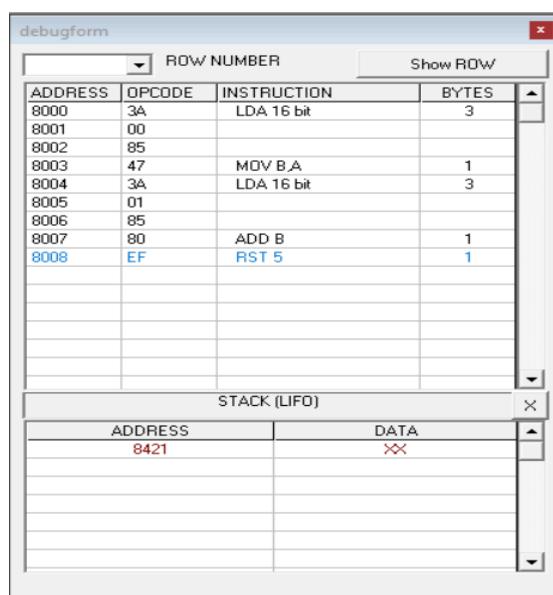
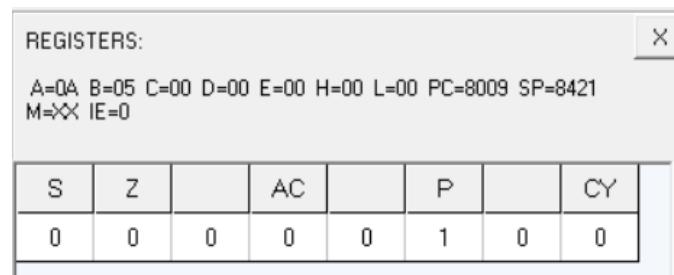
Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
MOV B,A	8003	47
LDA 8501 H	8004,8005,8006	3A, 01, 85
ADD B	8007	80
RST 5	8008	EF

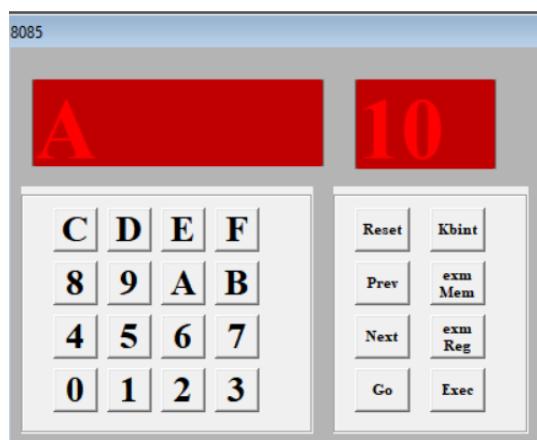
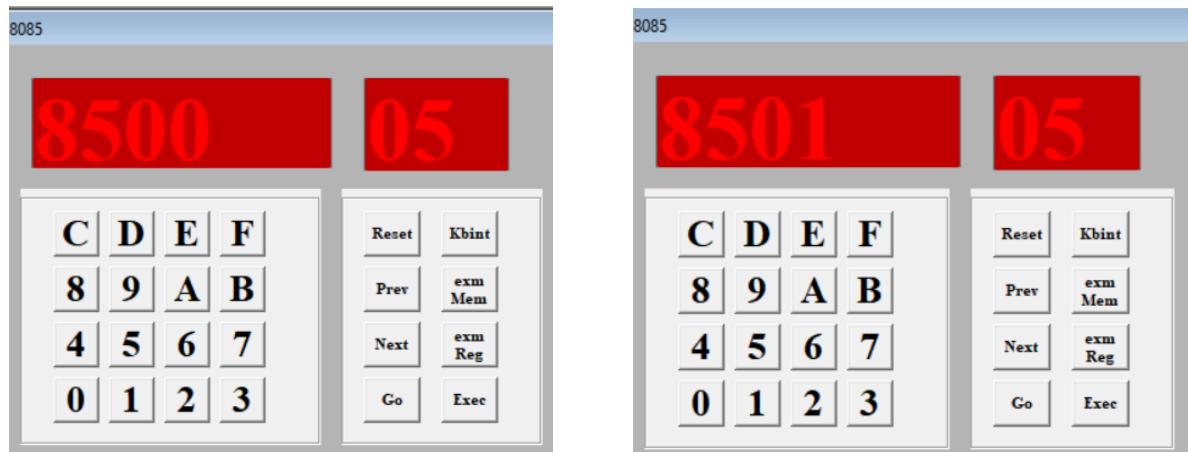
**Input :** [8500] – 05, [8501] – 05

### **Output :**

Registers : [A] – 0A

Flags: S – 0, Z – 0, AC – 0, P – 1, CY – 0





### Indirect :

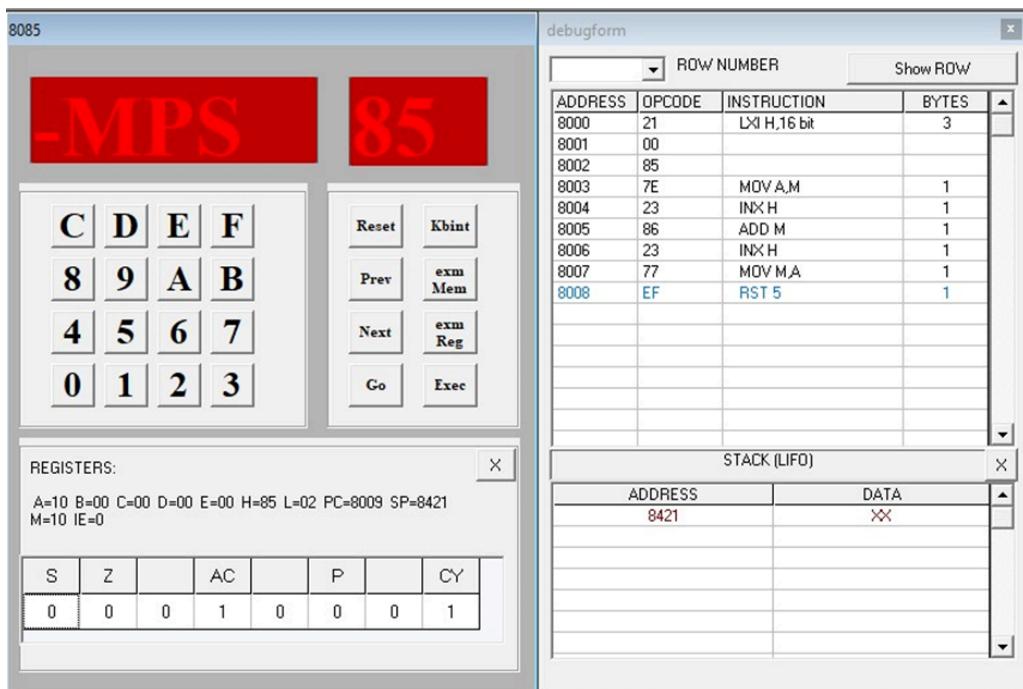
Code	Memory Location	Opcode
LXI H, 8500	8000, 8001, 8002	21, 00, 85
MOV A, M	8003	7E
INX H	8004	23
ADD M	8005	86
INX H	8006	23
MOV M, A	8007	77
RST 5	8008	EF

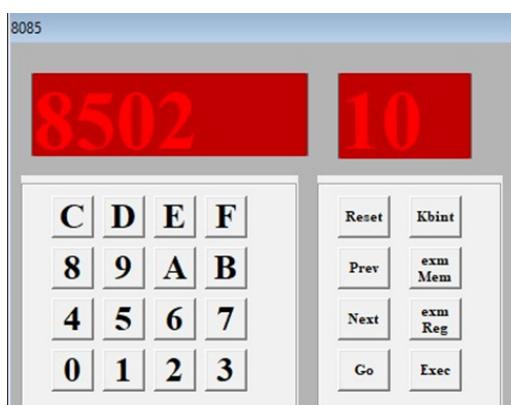
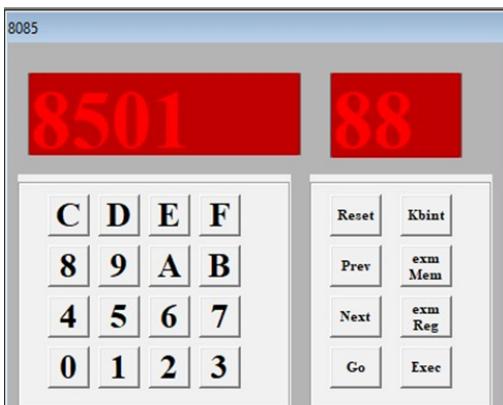
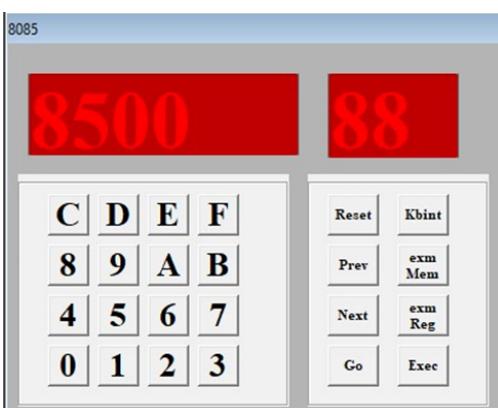
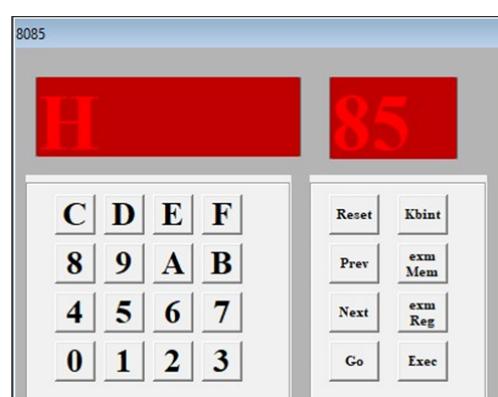
**Input :** [8500] – 88, [8501] – 88, [8502] - 10

**Output :**

Registers: [A] – 10, [H] – 85, [L] - 02

Flags: S – 0, Z – 0, AC – 1, P – 0, CY - 1





## Program No. 2 (iv)

**Aim:** 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

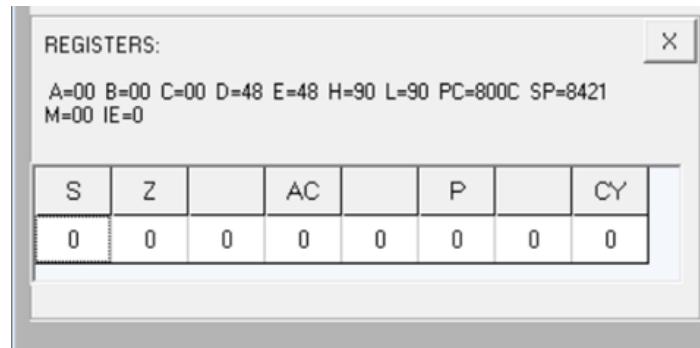
**Input:** [8500] - 48, [8501] - 48, [8502] - 48, [8503] - 48

### Output:

Registers: [D] – 48, [E] – 48, [H] – 90, [L] - 90

Memory Address: [8504] - 90, [8505] - 90

Flags: S – 0, Z – 0, AC – 0, P – 0, CY – 0



8085

# -MPS

# 85

C	D	E	F
8	9	A	B
4	5	6	7
0	1	2	3

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

REGISTERS:

A=00 B=00 C=00 D=48 E=48 H=90 L=90 PC=800C SP=8421  
M=00 IE=0

S	Z		AC		P		CY
0	0	0	0	0	0	0	0

debugform

ADDRESS	OPCODE	INSTRUCTION	BYTES
8000	2A	LHLD 16 bit	3
8001	00		
8002	85		
8003	EB	XCHG	1
8004	2A	LHLD 16 bit	3
8005	02		
8006	85		
8007	19	DAD D	1
8008	22	SHLD 16 bit	3
8009	04		
800A	85		
800B	EF	RST 5	1

STACK (LIFO)

ADDRESS	DATA
8421	XX

8085

# D

# 48

C	D	E	F
8	9	A	B
4	5	6	7
0	1	2	3

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

8085

# E

# 48

C	D	E	F
8	9	A	B
4	5	6	7
0	1	2	3

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

8085

# H

# 90

C	D	E	F
8	9	A	B
4	5	6	7
0	1	2	3

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

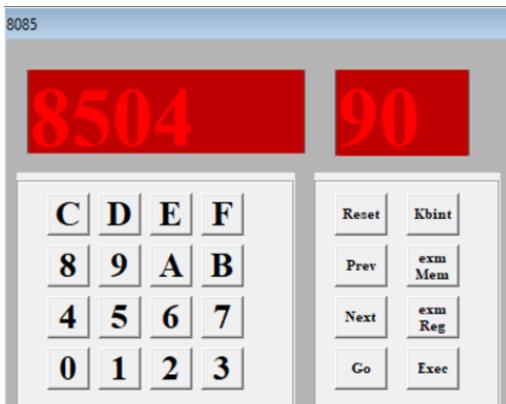
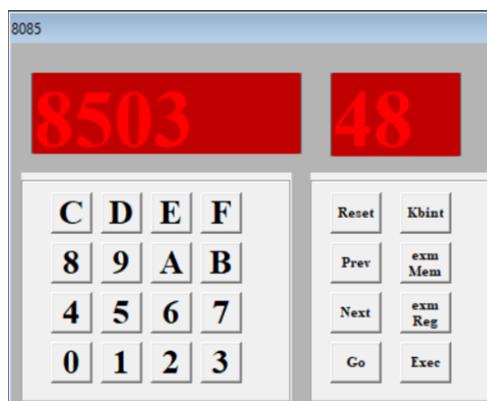
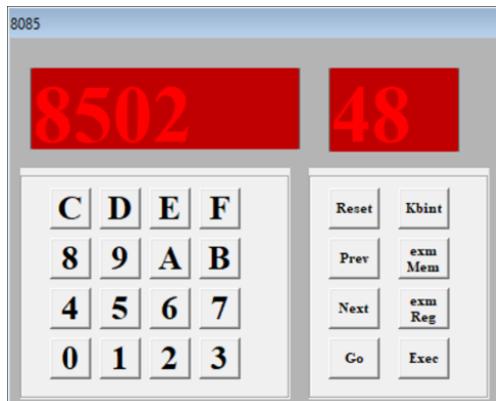
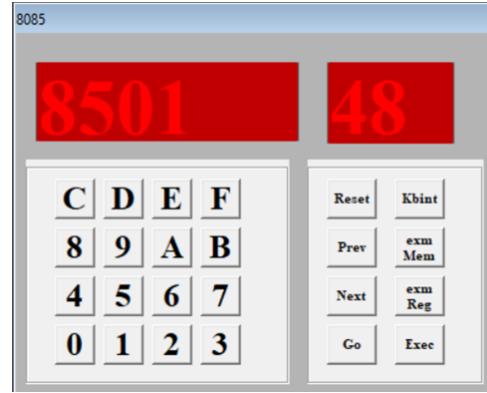
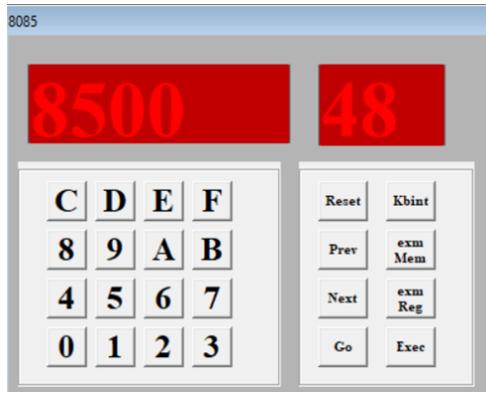
8085

# L

# 90

C	D	E	F
8	9	A	B
4	5	6	7
0	1	2	3

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec



### Indirect :

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

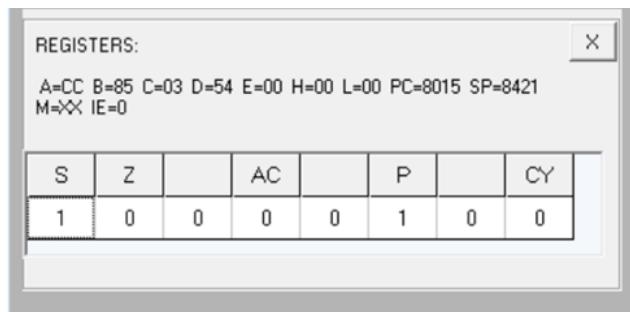
**Input:** [8500] – 34, [8501] – 48, [8502] – 54, [8503] – 78

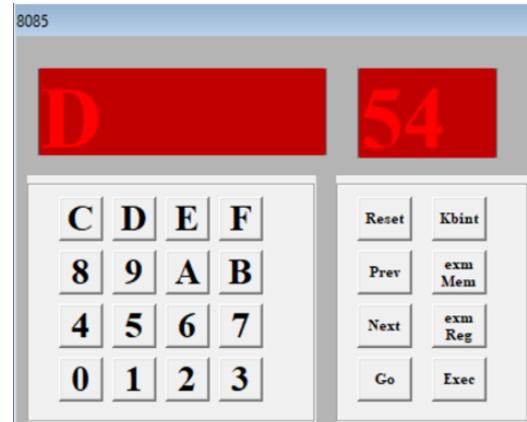
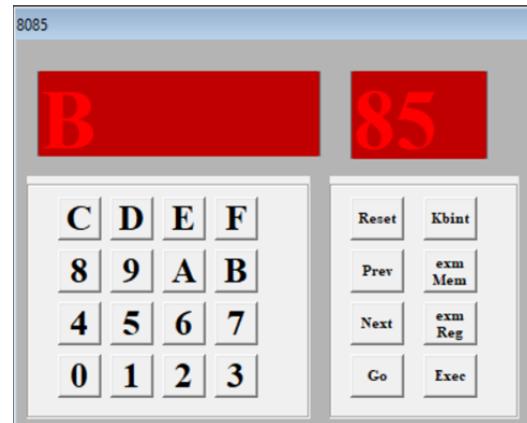
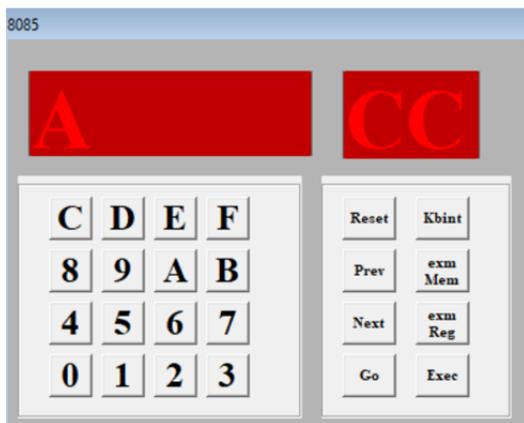
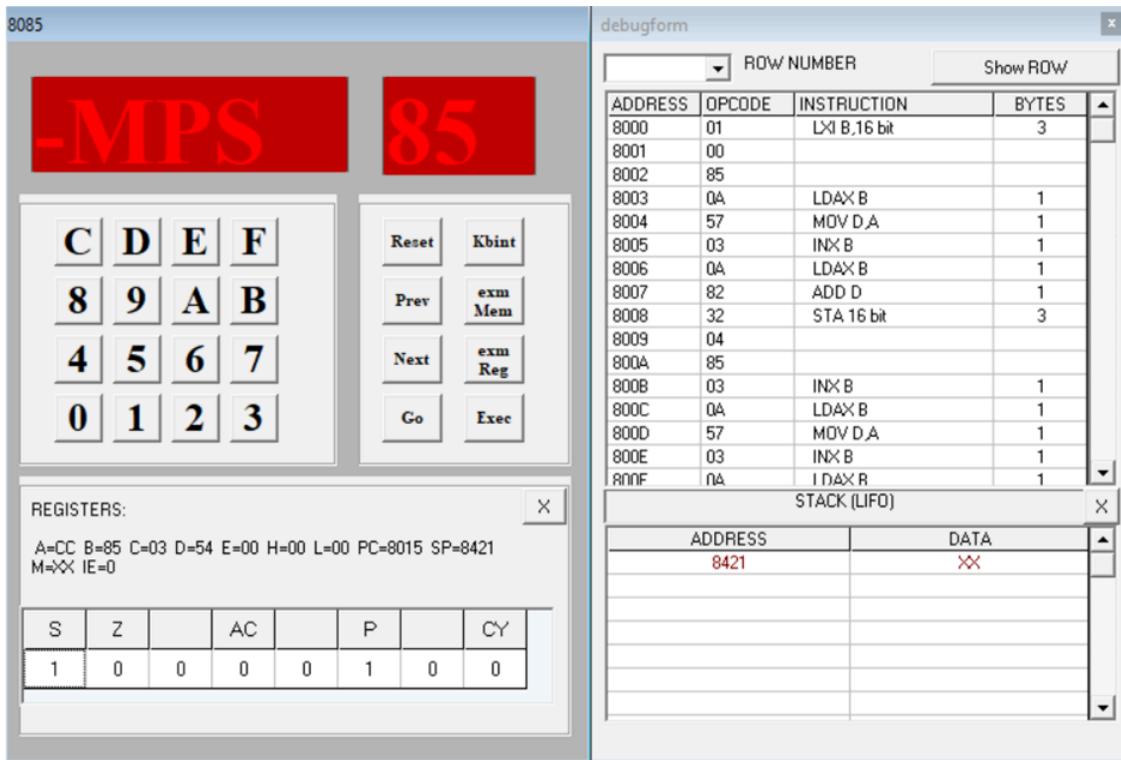
**Output:**

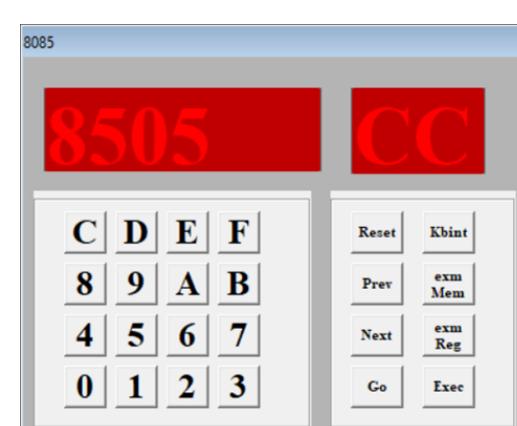
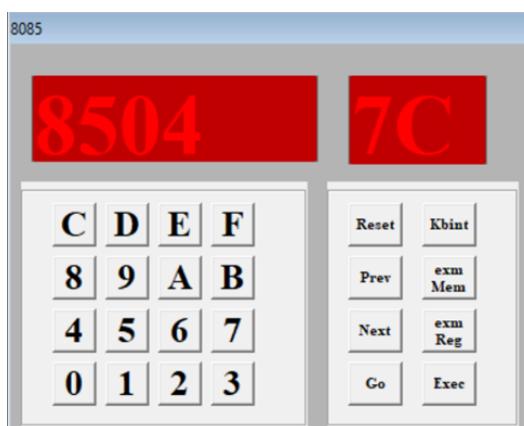
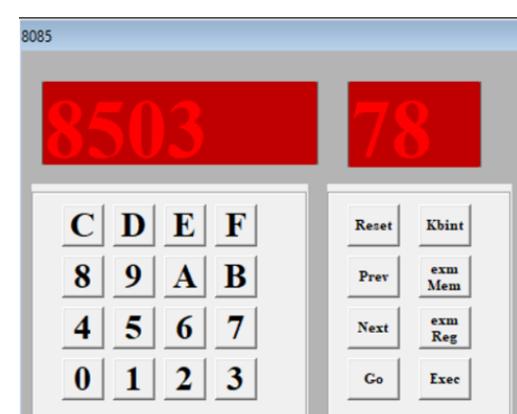
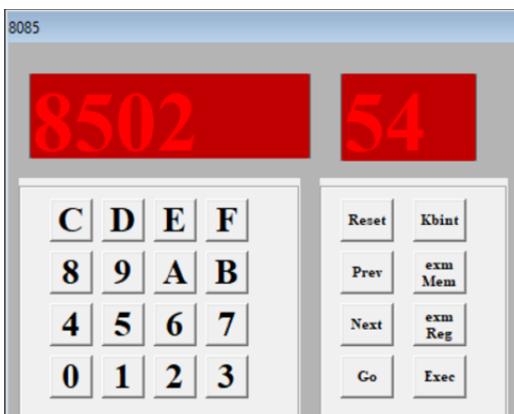
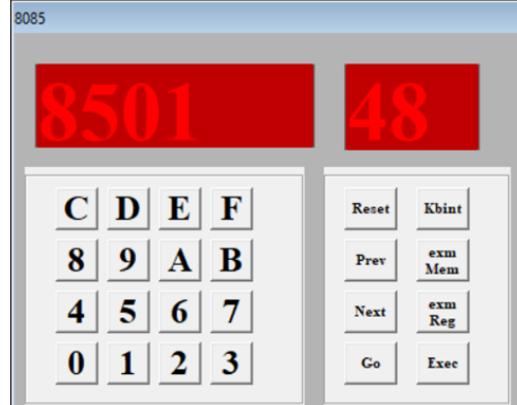
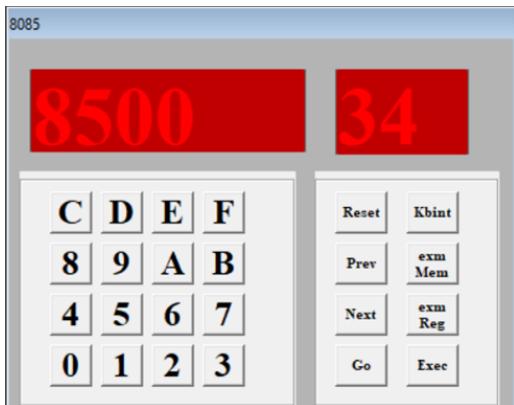
Registers: [D] – 48, [E] – 48, [H] – 90, [L] - 90

Memory Address: [8504] – 7C, [8505] - CC

Flags: S – 1, Z – 0, AC – 0, P – 1, CY – 0







## Program No. 2 (v)

**Aim::** Write a program to add 8-bit numbers using carry. (using JNC instruction).

Code	Memory Location	Opcode
MVI C, 00	8000, 8001	0E, 00
LXI H, 8500	8002, 8003, 8004	21, 00, 85
MOV A, M	8005	7E
INX H	8006	23
ADD M	8007	86
JNC Next	8008, 8009, 800A	D2, 0C, 80
INR C	800B	0C
Next: INX H	800C	23
MOV M, A	800D	77
INX H	800E	23
MOV M, C	800F	71
RST 5	8010	EF

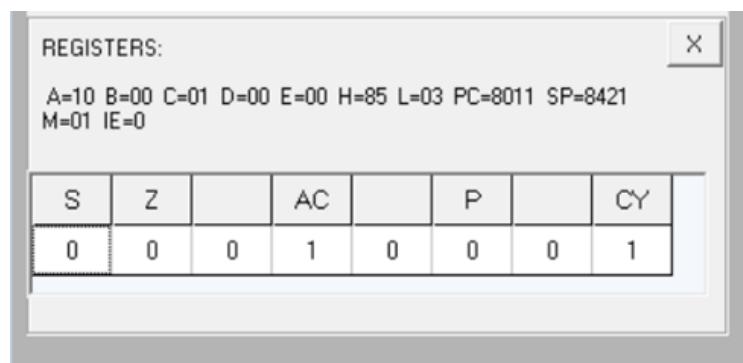
**Input:** [8500] – 88, [8501] – 88

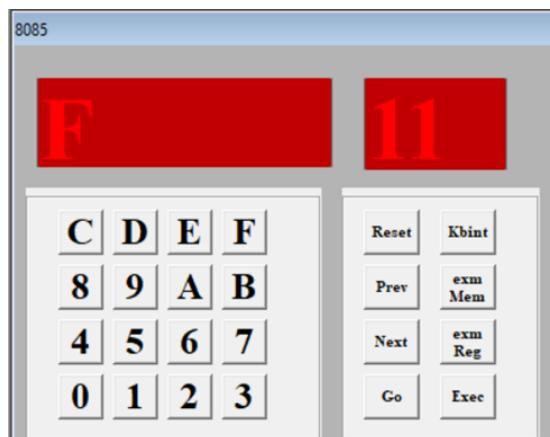
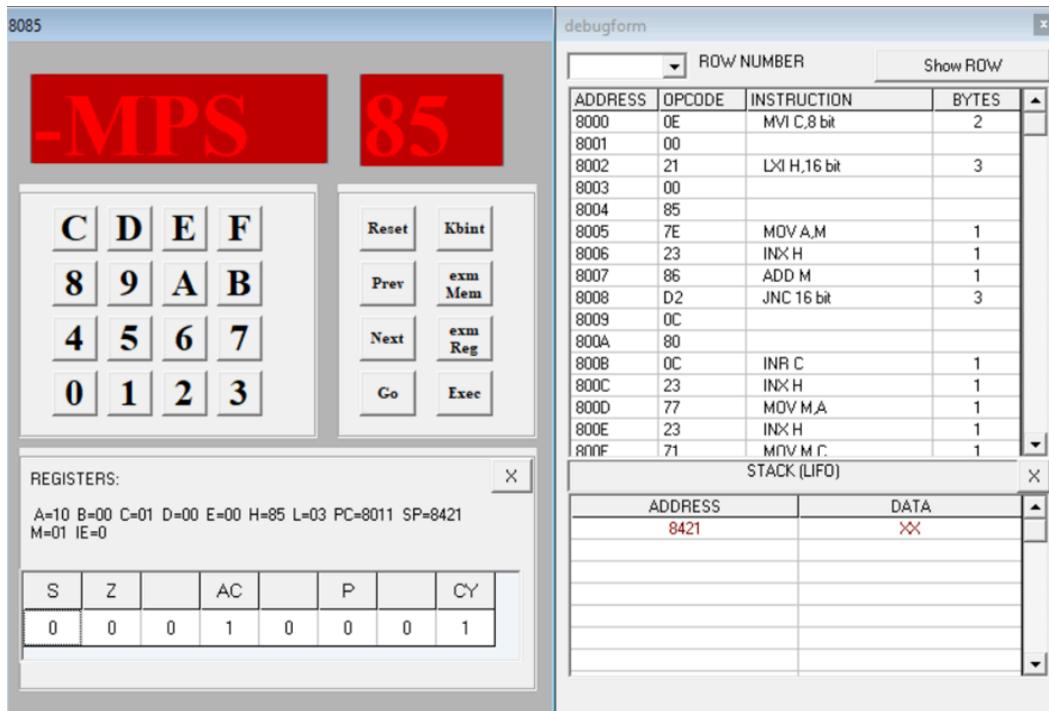
**Output:**

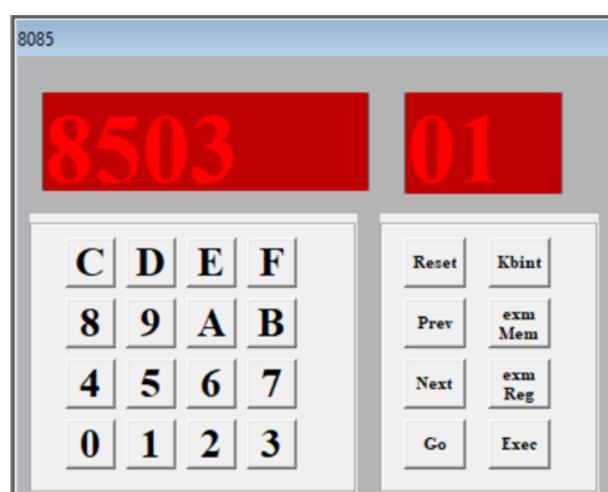
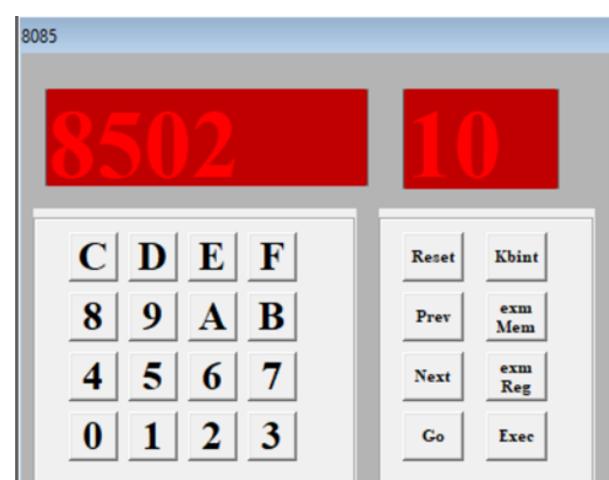
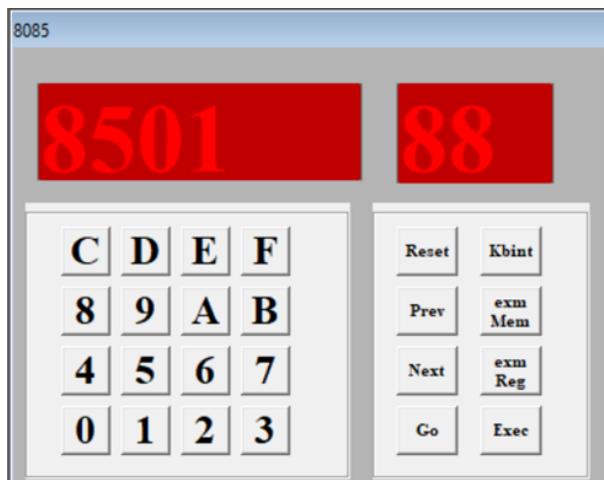
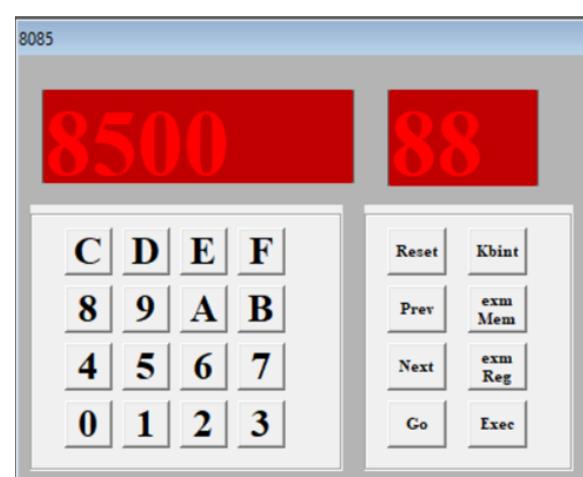
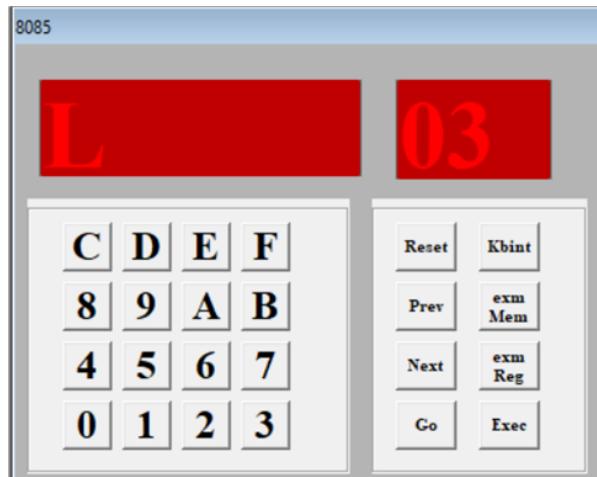
Registers: [A] – 10, [C] - 01, [F] - 11, [H] - 85, [L] - 03

Memory Address: [8502] – 10, [8503] – 01

Flags: S – 0, Z – 0, AC – 1, P – 0, CY – 1







## Program No. 2 (vi)

**Aim:** Write a program to find 1's complement and 2's complement of 8-bit number.

**1s complement :**

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
CMA	8003	2F
STA 8501H	8004, 8005, 8006	32, 01, 85
RST 5	8007	EF

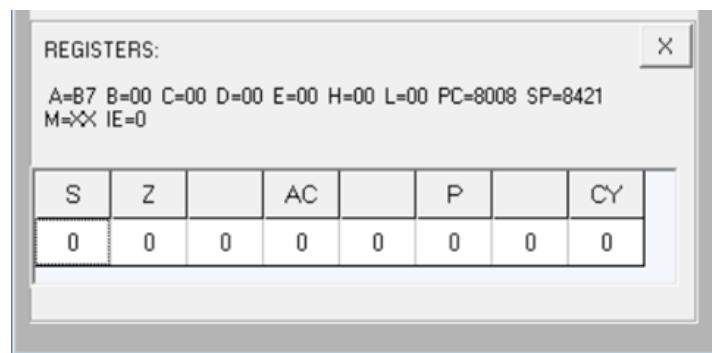
**Input:** [8500] – 48

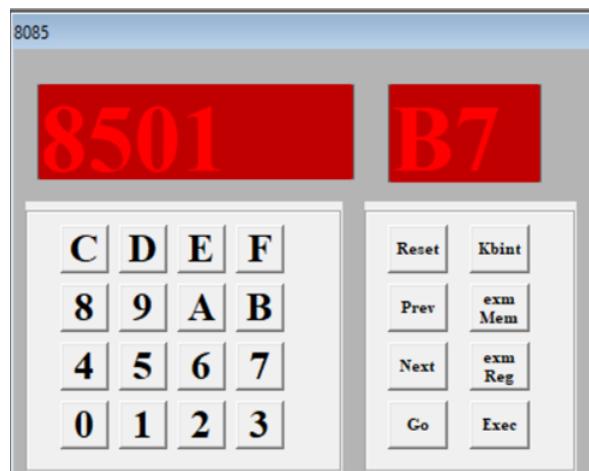
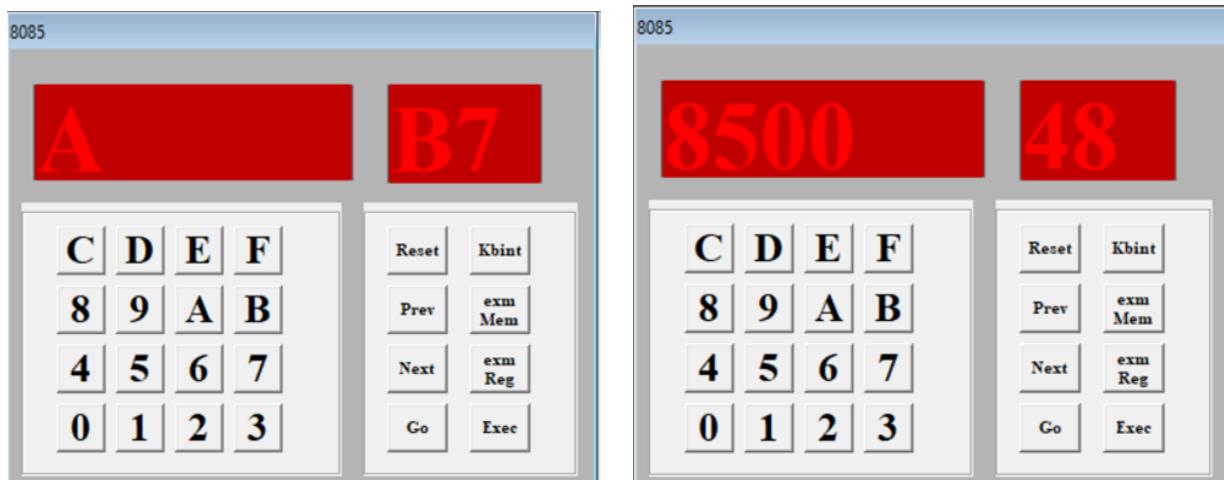
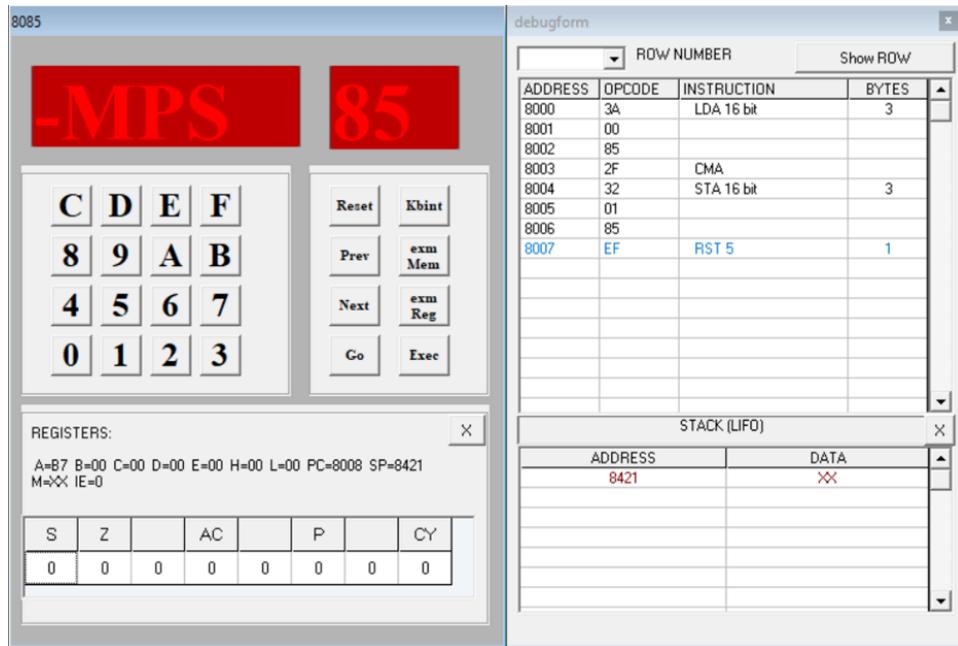
**Output:**

Registers: [A] – B7

Memory Address: [8501] – B7

Flags: S – 0, Z – 0, AC – 0, P – 0, CY - 0





**2s complement :**

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
CMA	8003	2F
INR A	8004	3C
STA 8501H	8005, 8006, 8007	32, 01, 85
RST 5	8008	EF

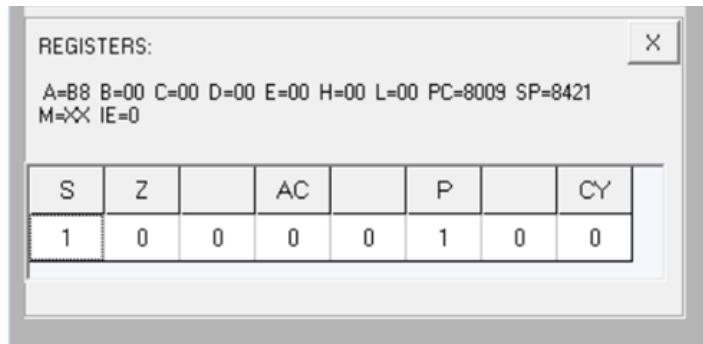
**Input:** [8500] – 48

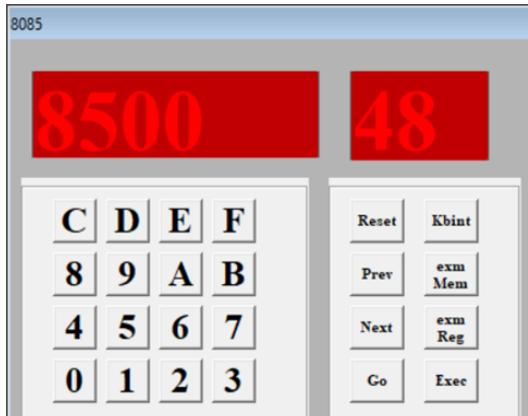
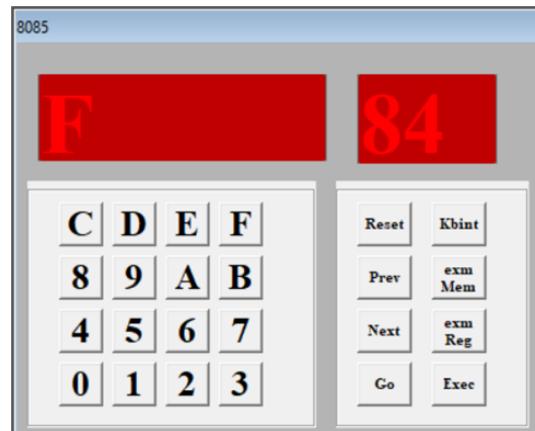
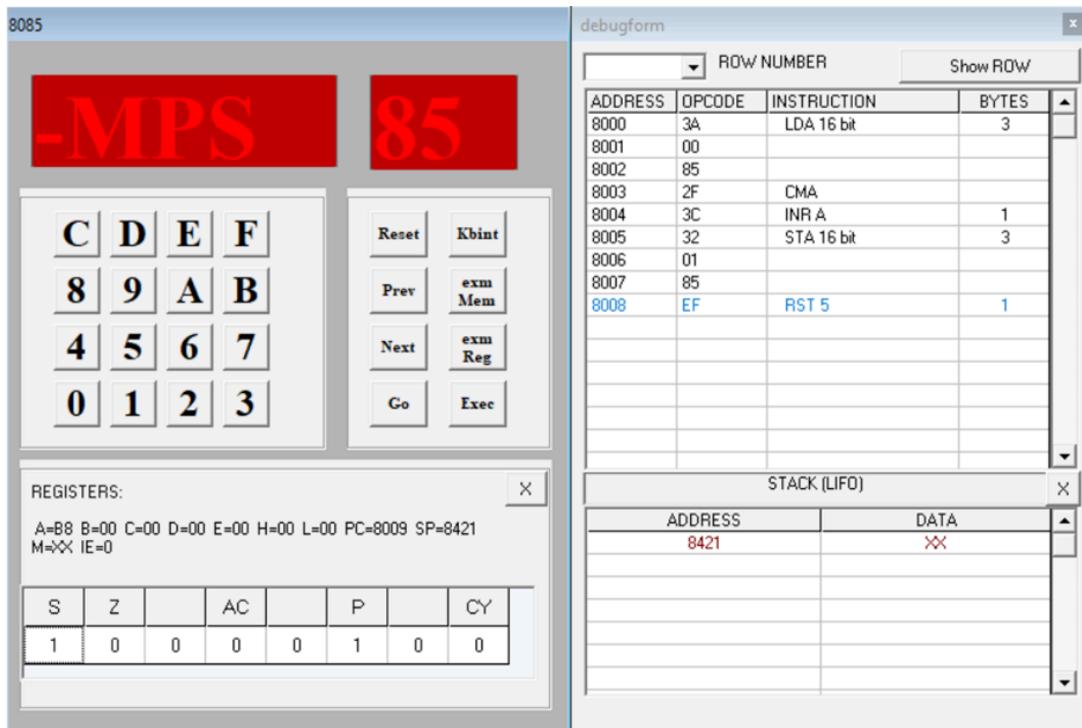
**Output:**

Registers: [A] – B8, [F] - 84

Memory Address: [8501] – B8

Flags: S – 1, Z – 0, AC – 0, P – 1, CY - 0





### Program No. 3

**Aim:** Write a program for the sum of series of numbers.

Code	Memory Location	Opcode
LDA 8500 H	8000, 8001, 8002	3A, 00, 85
MOV C, A	8003	4F
SUB A	8004	97
LXI H, 8501H	8005, 8006, 8007	21, 01, 85
Back: ADD M	8008	86
INX H	8009	23
DCR C	800A	0D
JNZ Back	800B, 800C, 800D	C2, 08, 80
STA 8600H	800E	32, 00, 86
RST 5	800F	EF

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

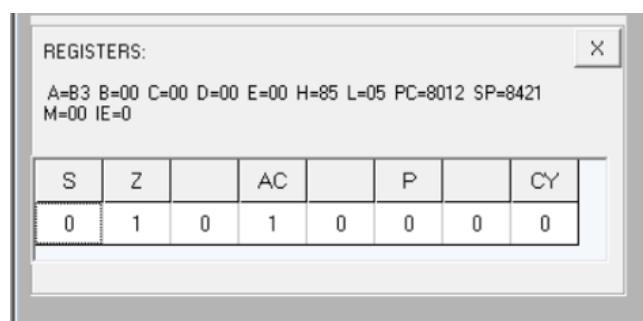
Result: 1B3

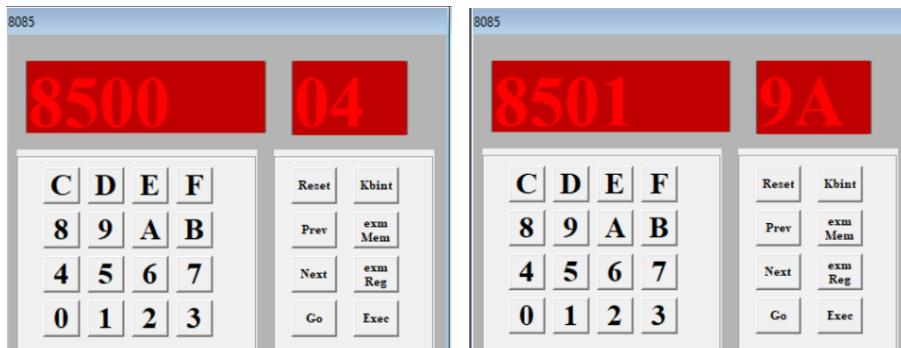
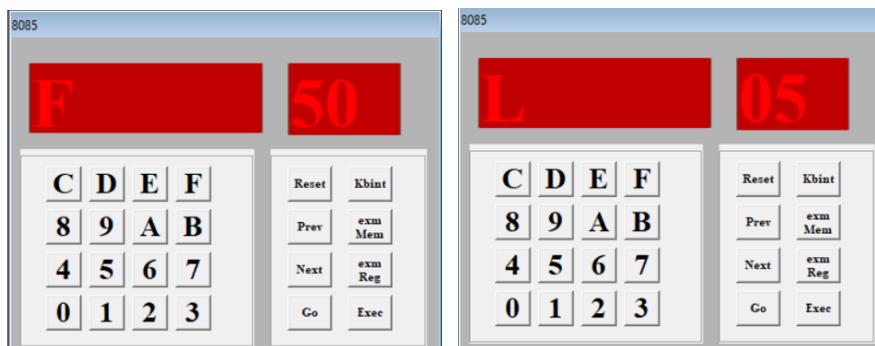
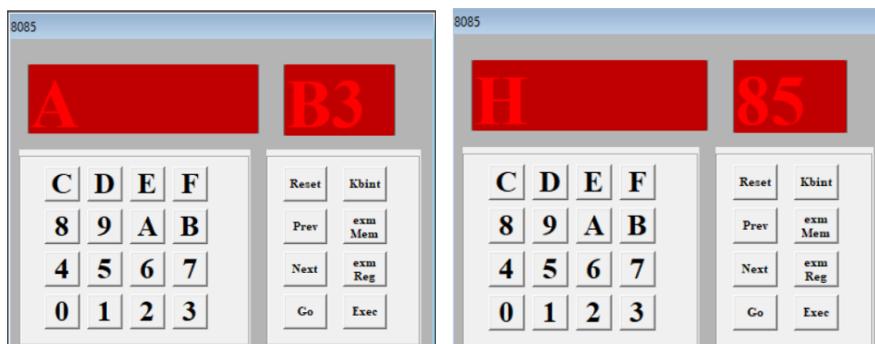
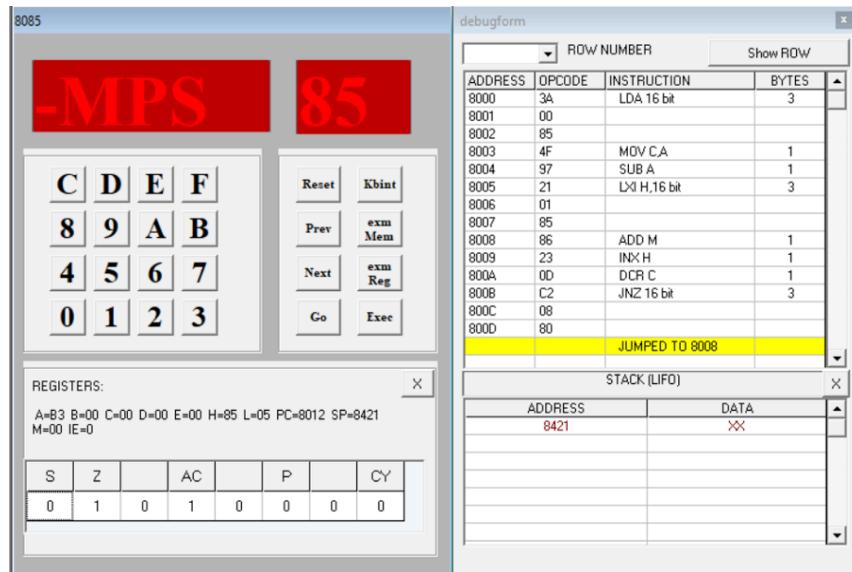
#### **Output:**

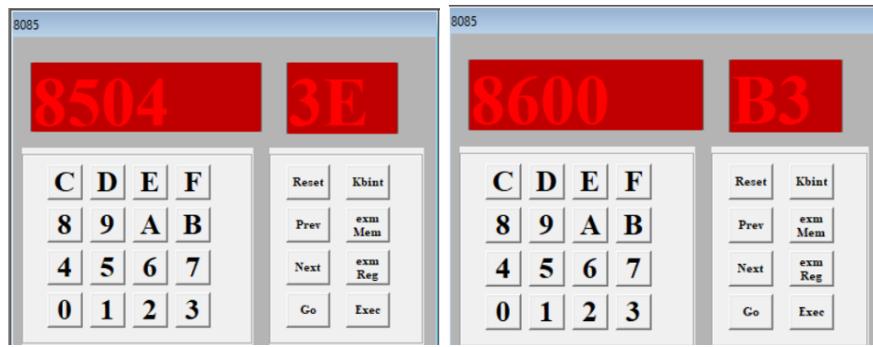
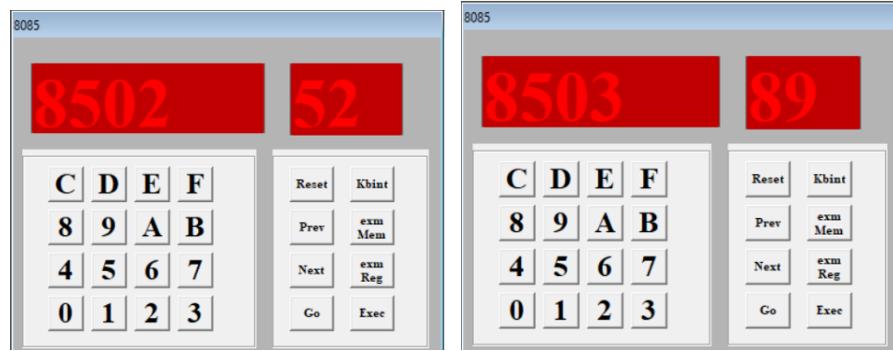
Registers: [A] – B3, [F] – 50, [H] – 85, [L] - 05

Memory Address: [8600] – B3

Flags: S – 0, Z – 1, AC – 1, P – 0, CY – 0







## Program No. 4

**Aim:** Write a program for data transfer from memory block B1 to memory block B2.

Code	Memory Location	Opcode
MVI C, 0AH	8000, 8001	0E, 0A
LXI H, 8500H	8002, 8003, 8004	21, 00, 85
LXI D, 8600H	8005, 8006, 8007	11, 00, 86
Back: MOV A, M	8008	7E
STAX D	8009	12
INX H	800A	23
INX D	800B	13
DCR C	800C	0D
JNZ Back	800D, 800E, 800F	C2, 08, 80
RST 5	8010	EF

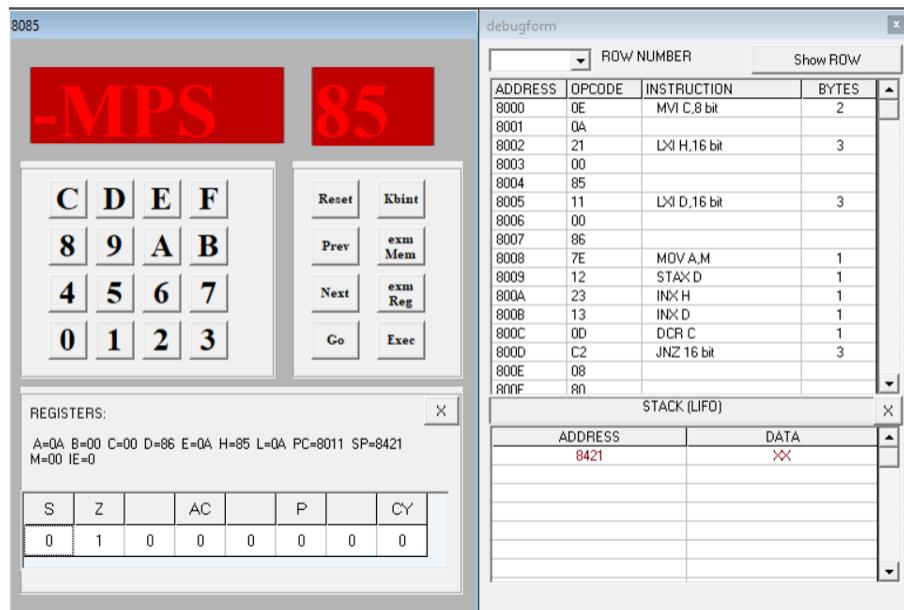
**Input:** [8500] – 01, [8501] – 02, [8502] – 03,..... [8509] – 0A

**Output:**

Registers: [A] – 0A, [E] – 0A, [H] – 85, [L] – 0A

Memory Address: [8600] – 01, [8601] – 02, [8602] – 03,..... [8609] – 0A

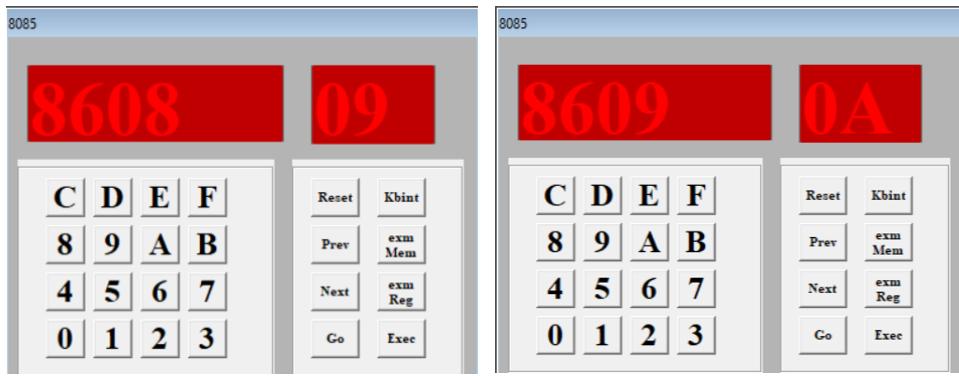
Flags: S – 0, Z – 1, AC – 0, P – 0, CY – 0



REGISTERS:							
S	Z		AC		P		CY
0	1	0	0	0	0	0	0

8085 <b>A</b> 0A <table border="1"><tr><td>C</td><td>D</td><td>E</td><td>F</td></tr><tr><td>8</td><td>9</td><td>A</td><td>B</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>0</td><td>1</td><td>2</td><td>3</td></tr></table> <table border="1"><tr><td>Reset</td><td>Kbint</td></tr><tr><td>Prev</td><td>exm Mem</td></tr><tr><td>Next</td><td>exm Reg</td></tr><tr><td>Go</td><td>Exec</td></tr></table>	C	D	E	F	8	9	A	B	4	5	6	7	0	1	2	3	Reset	Kbint	Prev	exm Mem	Next	exm Reg	Go	Exec	8085 <b>D</b> 86 <table border="1"><tr><td>C</td><td>D</td><td>E</td><td>F</td></tr><tr><td>8</td><td>9</td><td>A</td><td>B</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>0</td><td>1</td><td>2</td><td>3</td></tr></table> <table border="1"><tr><td>Reset</td><td>Kbint</td></tr><tr><td>Prev</td><td>exm Mem</td></tr><tr><td>Next</td><td>exm Reg</td></tr><tr><td>Go</td><td>Exec</td></tr></table>	C	D	E	F	8	9	A	B	4	5	6	7	0	1	2	3	Reset	Kbint	Prev	exm Mem	Next	exm Reg	Go	Exec	8085 <b>E</b> 0A <table border="1"><tr><td>C</td><td>D</td><td>E</td><td>F</td></tr><tr><td>8</td><td>9</td><td>A</td><td>B</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>0</td><td>1</td><td>2</td><td>3</td></tr></table> <table border="1"><tr><td>Reset</td><td>Kbint</td></tr><tr><td>Prev</td><td>exm Mem</td></tr><tr><td>Next</td><td>exm Reg</td></tr><tr><td>Go</td><td>Exec</td></tr></table>	C	D	E	F	8	9	A	B	4	5	6	7	0	1	2	3	Reset	Kbint	Prev	exm Mem	Next	exm Reg	Go	Exec
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## Program No. 5

**Aim:** Write a program for multiply two 8-bit numbers.

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
MOV E, A	8003	5F
MVI D, 00	8004, 8005	16, 00
LDA 8501H	8006, 8007, 8008	3A, 01, 85
MOV C, A	8009	4F
LXI H, 0000H	800A, 800B, 800C	21, 00, 00
Back: DAD D	800D	19
DCR C	800E	0D
JNZ Back	800F, 8010, 8011	C2, 0D, 80
SHLD 8600H	8012, 8013, 8014	22, 00, 86
RST 5	8015	EF

**Input:** [8500] – B2, [8501] – 03

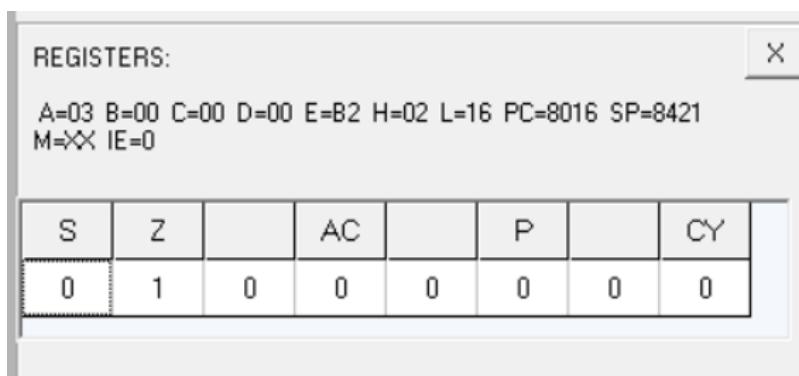
Result: B2 + B2 + B2 = 0216 H

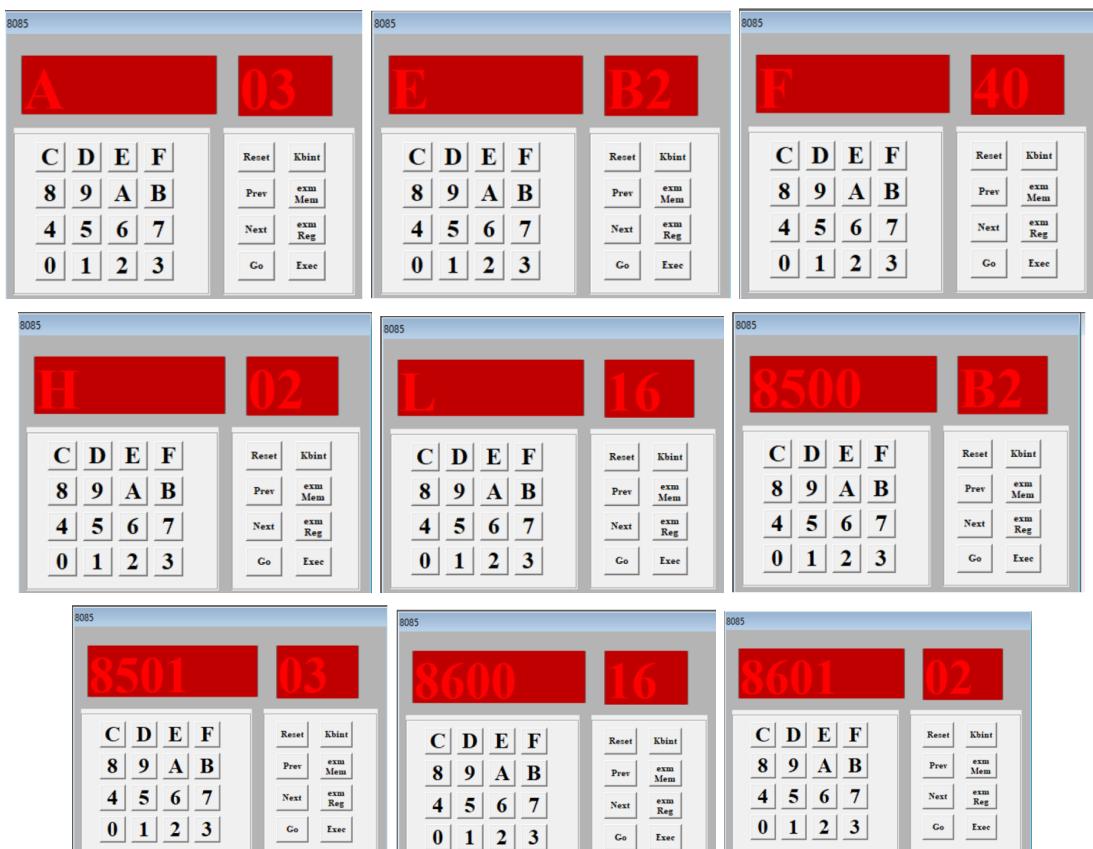
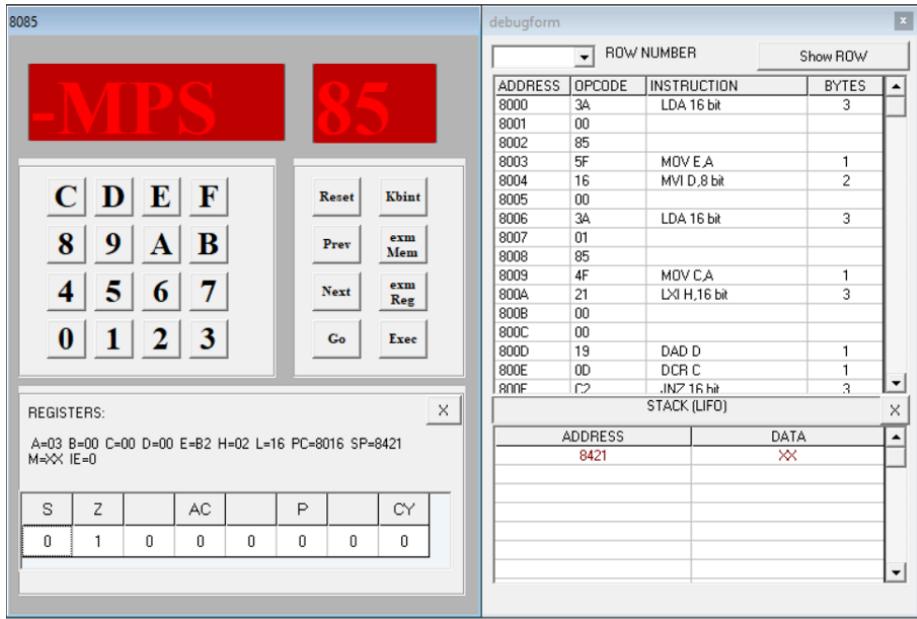
**Output:**

Registers: [A] – 03, [E] – B2, [H] – 02, [L] – 16

Memory Address: [8600] – 16, [8601] – 02

Flags: S – 0, Z – 1, AC – 0, P – 0, CY – 0





## Program No. 6

**Aim:** Write a program to add ten 8-bit numbers. Assume the numbers are stored 8500-8509. Store the result in 850A and 850B memory addresses.

Code	Memory Location	Opcode
MVI C, 00	8000, 8001	0E, 00
MVI B, 09	8002, 8003	06, 09
LXI H, 8500H	8004, 8005, 8006	21, 00, 85
MOV A, M	8007	7E
Back: INX H	8008	23
ADD M	8009	86
JNC Next	800A, 800B, 800C	D2, 0E, 80
INR C	800D	0C
Next: DCR B	800E	05
JNZ Back	800F, 8010, 8011	C2, 08, 80
INX H	8012	23
MOV M, A	8013	77
INX H	8014	23
MOV M, C	8015	71
RST 5	8016	EF

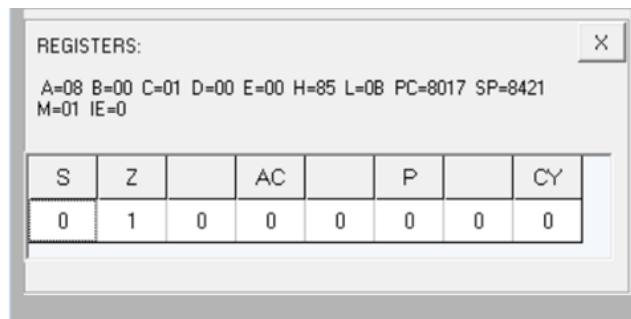
**Input:** [8500] – FF, [8501] – 01, [8502] – 01, [8503] – 01, [8504] – 01, [8505] – 01, [8506] – 01, [8507] – 01, [8508] – 01, [8509] – 01

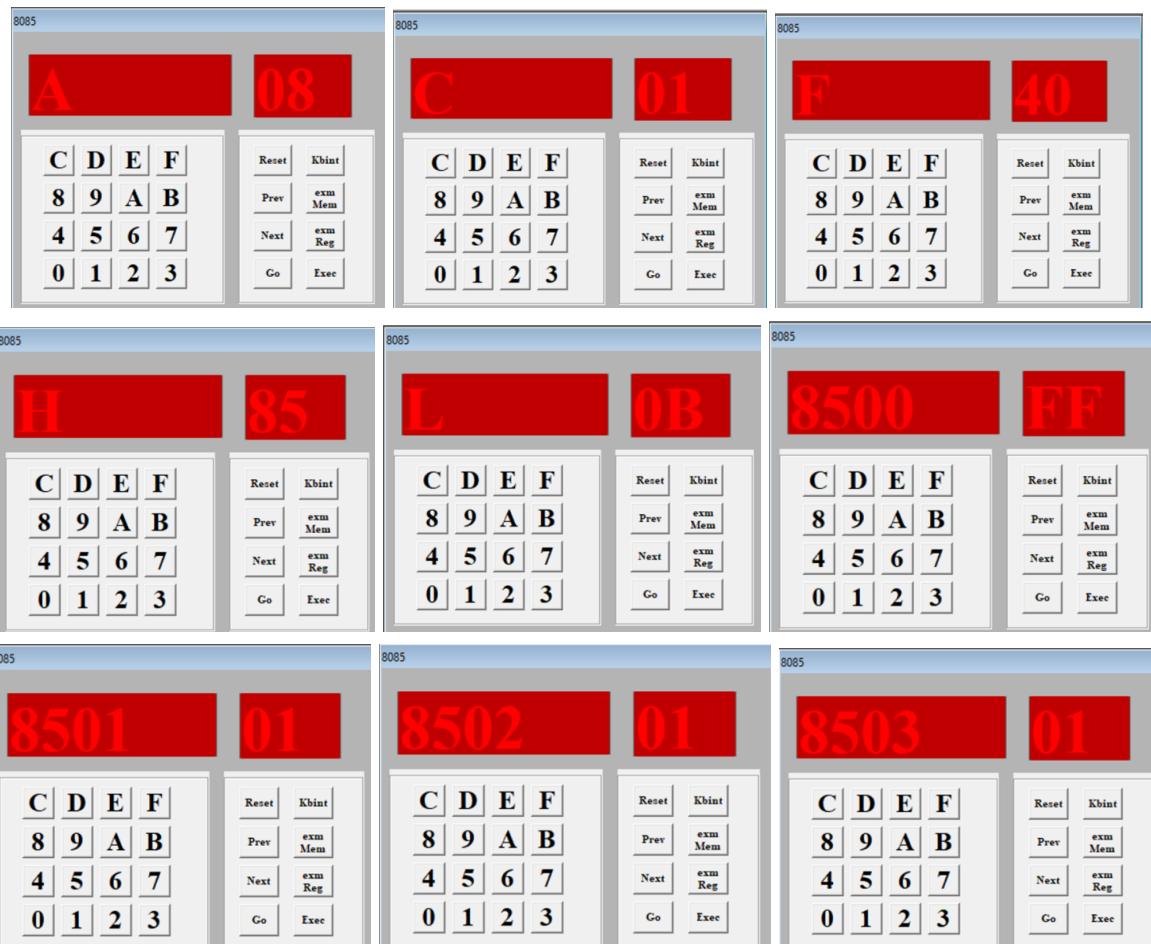
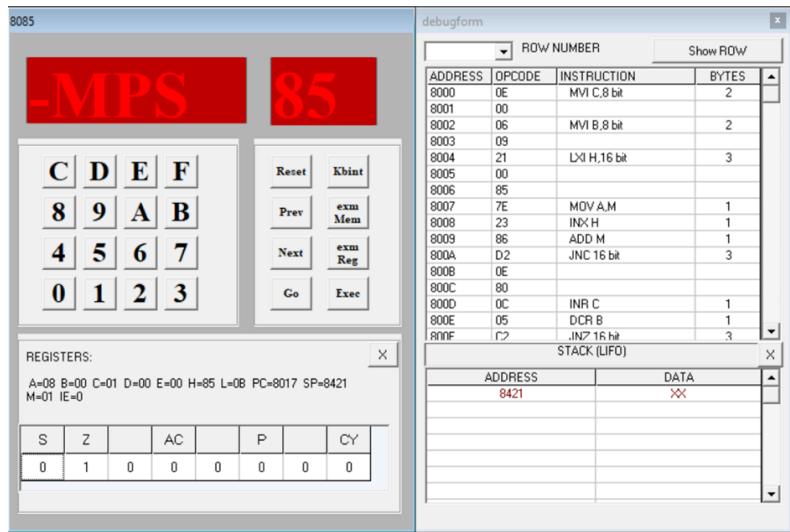
### Output:

Registers: [A] – 08, [C] – 0, [F] – 80, [H] – 85, [L] - 08

Memory Address: [850A] – 08, [850B] – 01

Flags: S – 0, Z – 1, AC – 0, P – 0, CY – 0





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## Program No. 7

**Aim:** Write a program to find the negative numbers in a block of data.

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
MOV C, A	8003	4F
MVI B, 00	8004, 8005	06, 00
LXI H, 8501H	8006, 8007, 8008	21, 01, 85
Back: MOV A, M	8009	7E
ANI 80H	800A, 800B	E6, 80
JZ Skip	800C, 800D, 800E	CA, 10, 80
INR B	800F	04
Skip: INX H	8010	23
DCR C	8011	0D
JNZ Back	8012, 8013, 8014	C2, 09, 80
MOV A, B	8015	78
STA 8600H	8016, 8017, 8018	32, 00, 86
RST 5	8019	EF

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

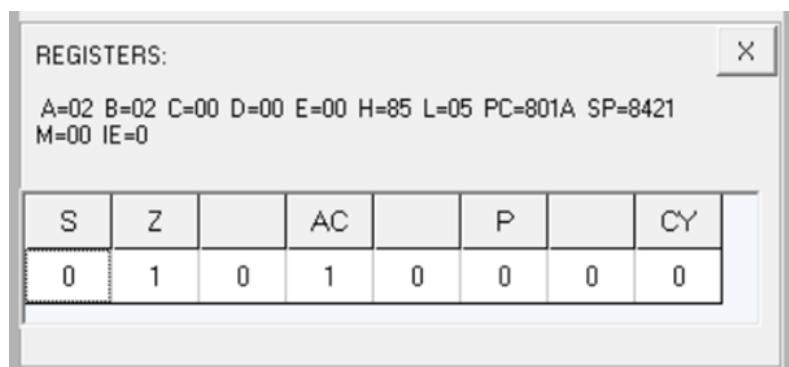
Result: 02

**Output:**

Registers: [A] – 02, [B] – 02, [H] – 85, [L] - 05

Memory Address: [8600] – 02

Flags: S – 0, Z – 1, AC – 1, P – 0, CY – 0



**8085**

<b>-MPS</b>				<b>85</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

REGISTERS:  
A=02 B=02 C=00 D=00 E=00 H=85 L=05 PC=801A SP=8421  
M=00 IE=0

S	Z	AC	P	CY
0	1	0	0	0

**debugform**

ADDRESS	OPCODE	INSTRUCTION	BYTES
8000	3A	LDA 16 bit	3
8001	00		
8002	00		
8003	4F	MOV C,A	1
8004	06	MVI B,8 bit	2
8005	00		
8006	21	LXI H,16 bit	3
8007	01		
8008	85		
8009	7E	MOV A,M	1
800A	E6	ANI 8 bit	2
800B	80		
800C	CA	JZ 16 bit	3
800D	10		
800E	80	JMPFD TO R000	3

**STACK [LIFO]**

ADDRESS	DATA
8421	xx

**8085**

<b>A</b>				<b>02</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>B</b>				<b>02</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>F</b>				<b>50</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>H</b>				<b>85</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>L</b>				<b>05</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>8500</b>				<b>04</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>8501</b>				<b>56</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>8502</b>				<b>A9</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>8503</b>				<b>73</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>8504</b>				<b>82</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

**8085**

<b>8600</b>				<b>02</b>
C	D	E	F	
8	9	A	B	
4	5	6	7	
0	1	2	3	

Reset	Kbint
Prev	exm Mem
Next	exm Reg
Go	Exec

## Program No. 8

**Aim:** Write a program to count the number of one's in a number.

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
MVI B, 08	8003, 8004	06, 08
MVI D, 00	8005, 8006	16, 00
Loop1: RLC	8007	07
JNC Loop2	8008, 8009, 800A	D2, 0C, 80
INR D	800B	14
Loop2: DCR B	800C	05
JNZ Loop1	800D, 800E, 800F	C2, 07, 80
MOV A, D	8010	7A
STA 8600H	8011, 8012, 8013	32, 00, 86
RST 5	8014	EF

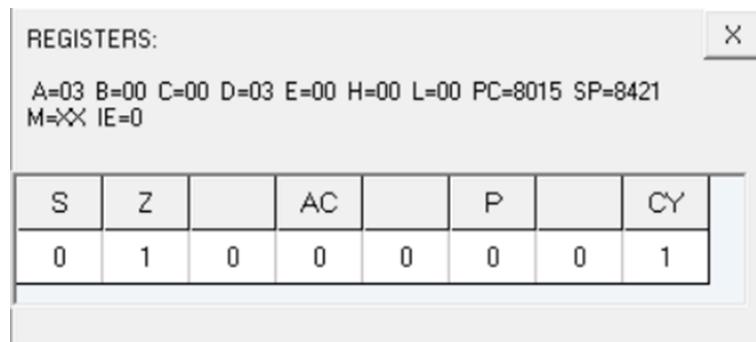
**Input:** [8500] – 25 – 0010 0101

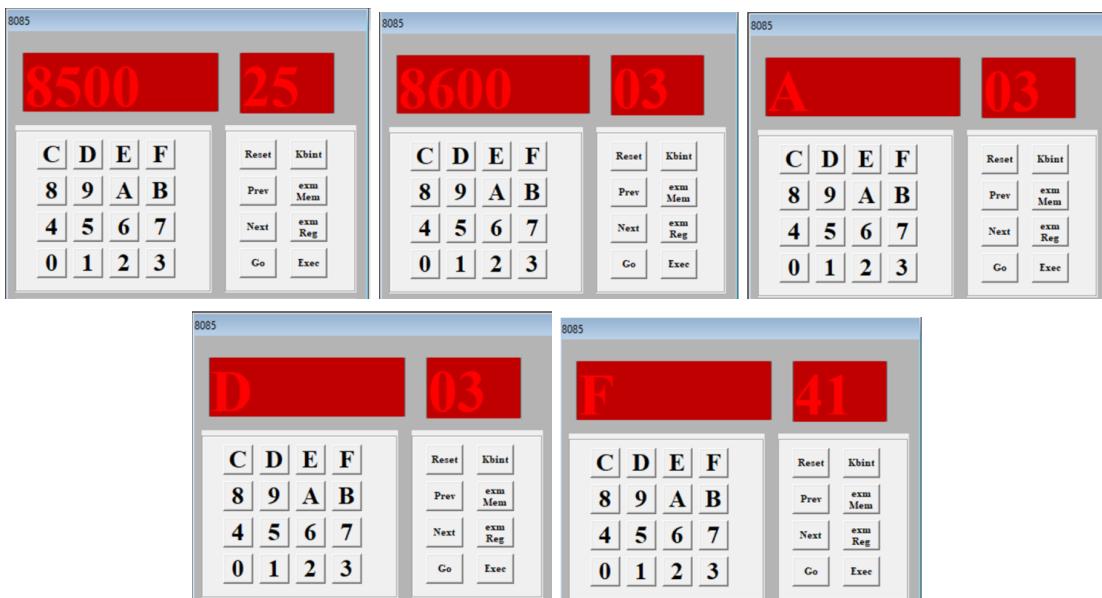
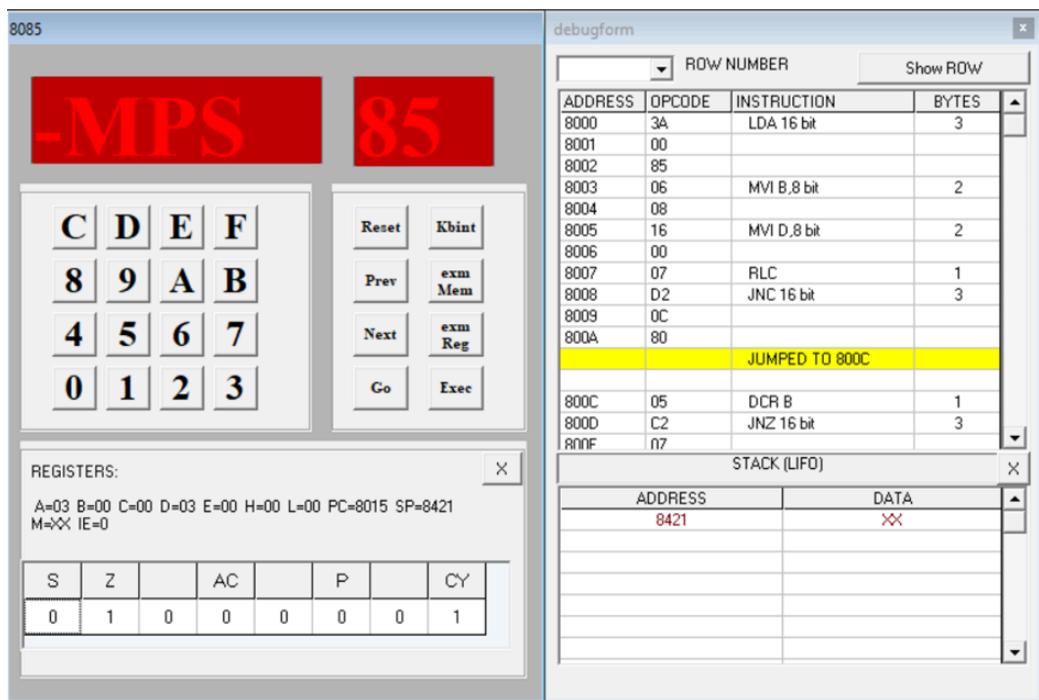
**Output:**

Registers: [A] – 03, [D] – 03, [F] – 41

Memory Address: [8600] – 03

Flags: S – 0, Z – 1, AC – 0, P – 0, CY – 1





## Program No. 9

**Aim:** Write a program to arrange numbers in Ascending order.

Code	Memory Location	Opcode
LXI H, 8500H	8000, 8001, 8002	21, 00, 85
MOV C, M	8003	4E
DCR C	8004	0D
Repeat: MOV D, C	8005	51
LXI H, 8501H	8006, 8007, 8008	21, 01, 85
Loop: MOV A, M	8009	7E
INX H	800A	23
CMP M	800B	BE
JC Skip	800C, 800D, 800E	DA, 14, 80
MOV B, M	800F	46
MOV M, A	8010	77
DCX H	8011	2B
MOV M, B	8012	70
INX H	8013	23
Skip: DCR D	8014	15
JNZ Loop	8015, 8016, 8017	C2, 09, 80
DCR C	8018	0D
JNZ Repeat	8019, 801A, 801B	C2, 05, 80
RST 5	801C	EF

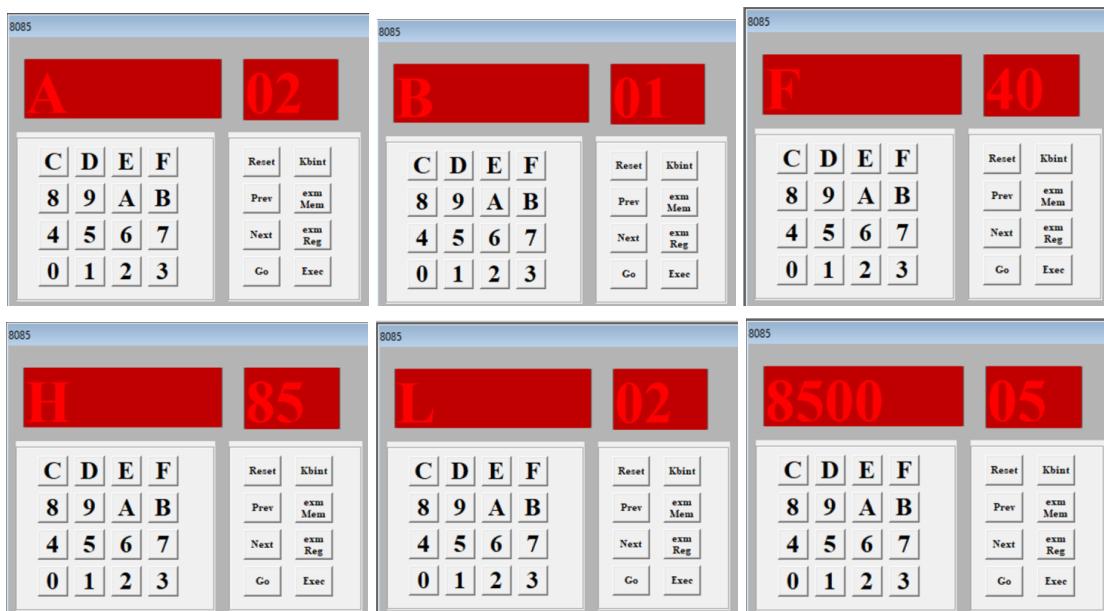
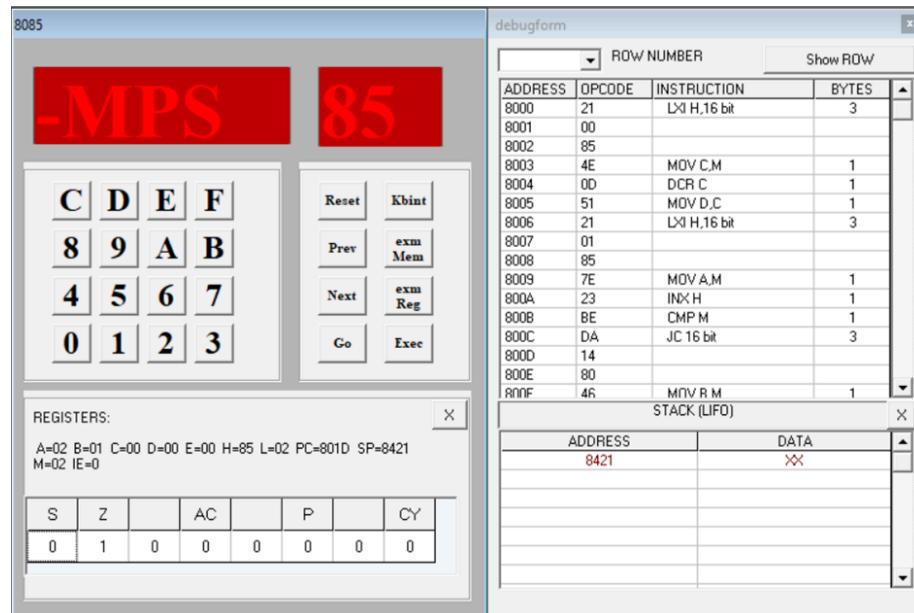
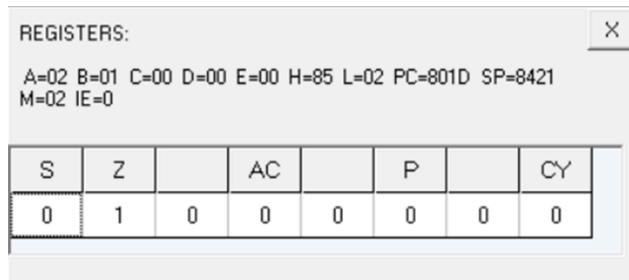
**Input:** [8500] – 05, [8501] – 05, [8502] – 04, [8503] – 03, [8504] – 02, [8505] – 01

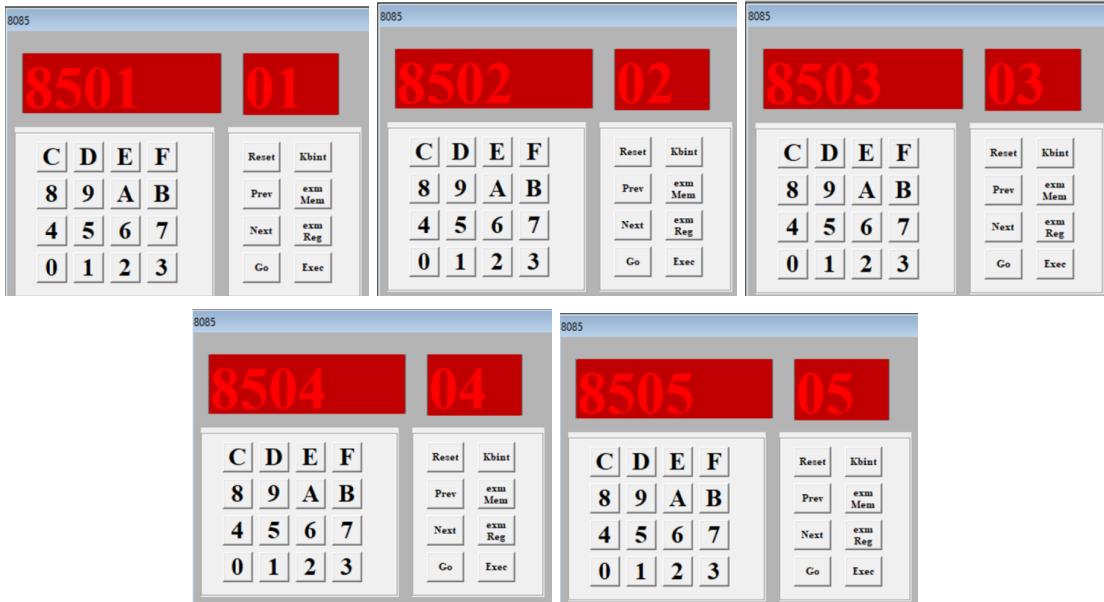
**Output:**

Registers: [A] – 02, [B] – 01, [F] – 40, [H] – 85, [L] – 02

Memory Address: [8500] – 05, [8501] – 01, [8502] – 02, [8503] – 03, [8504] – 04, [8505] – 05

Flags: S – 0, Z – 1, AC – 0, P – 0, CY – 0





## Program No. 10

**Aim:** Write a program to calculate the sum of a series of even numbers.

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
MOV C, A	8003	4F
MVI B, 00	8004, 8005	06, 00
LXI H, 8501H	8006, 8007, 8008	21, 01, 85
Back: MOV A, M	8009	7E
ANI 01	800A, 800B	E6, 01
JNZ Skip	800C, 800D, 800E	C2, 12, 80
MOV A, B	800F	78
ADD M	8010	86
MOV B, A	8011	47
Skip: INX H	8012	23
DCR C	8013	0D
JNZ Back	8014, 8015, 8016	C2, 09, 80
STA 8600H	8017, 8018, 8019	32, 00, 86
RST 5	801A	EF

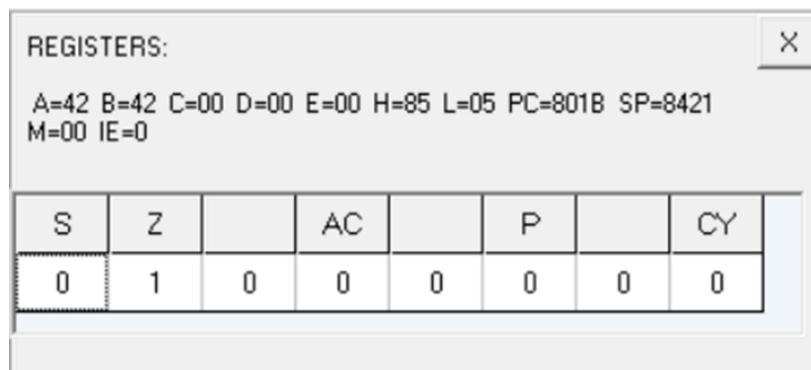
**Input:** [8500] – 04, [8501] – 20, [8502] – 15, [8503] – 13, [8504] – 22

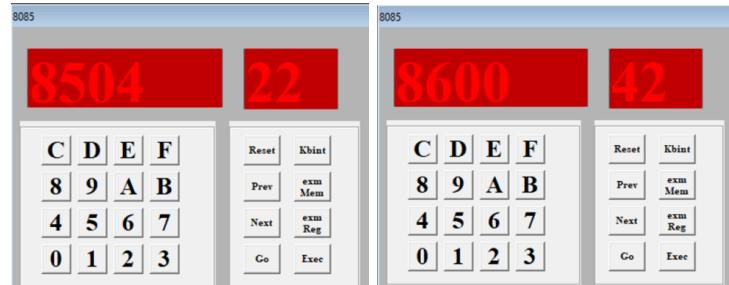
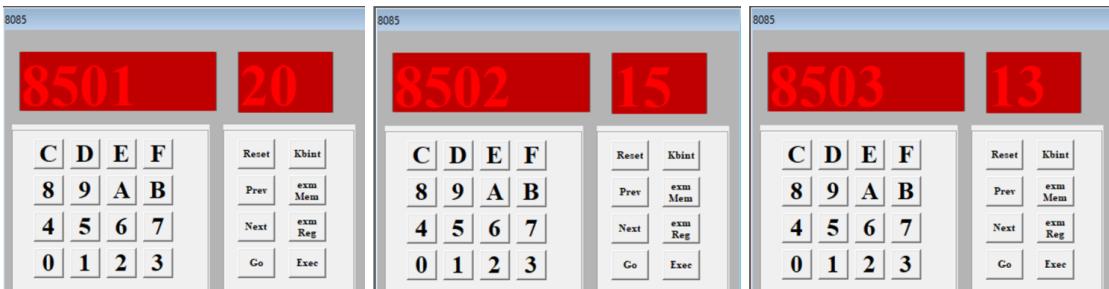
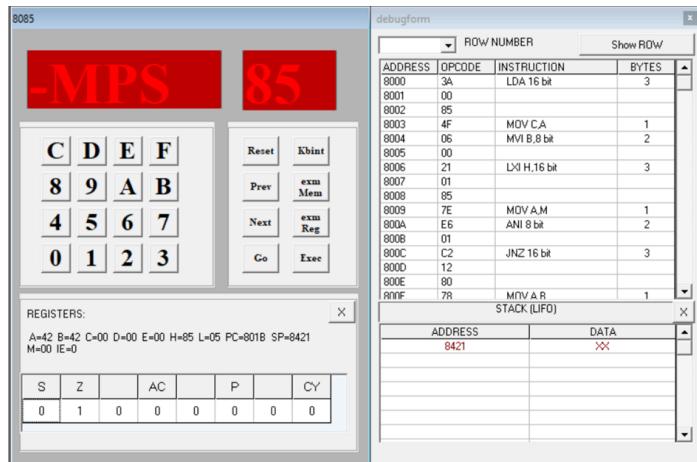
**Output:**

Registers: [A] – 42, [B] – 42, [F] – 40, [H] – 85, [L] – 05

Memory Address: [8600] – 42

Flags: S – 0, Z – 1, AC – 0, P – 0, CY – 1





## Program No.11

**Aim:** Write an assembly language program to verify how many bytes are present in a given set, which resembles 10101101 in 8085.

Code	Memory Location	Opcode
MVI B, 0A	8000, 8001	06, 0A
MVI D, AD	8002, 8003	16, AD
MVI C, 00	8004, 8005	0E, 00
LXI H, 8500H	8006, 8007, 8008	21, 00, 85
Back: MOV A, M	8009	7E
CMP D	800A	BA
JNZ Next	800B, 800C, 800D	C2, 0F, 80
INR C	800E	0C
Next: INX H	800F	23
DCR B	8010	05
JNZ Back	8011, 8012, 8013	C2, 09, 80
MOV A, C	8014	79
STA 8600H	8015, 8016, 8017	32, 00, 86
RST 5	8018	EF

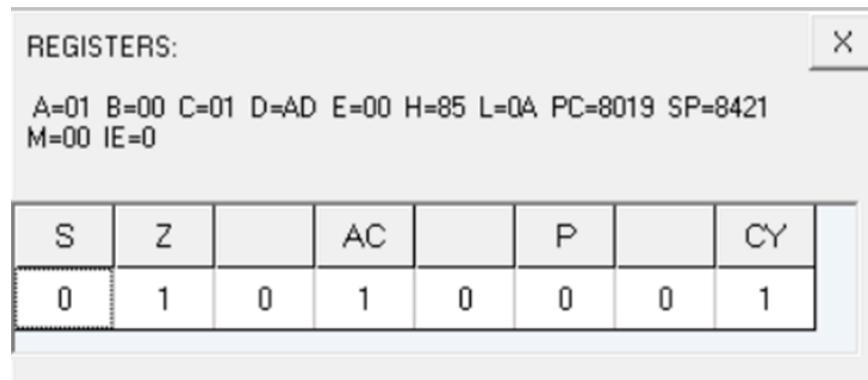
**Input:** [8500] – AD, [8501] – 01, [8502] – 01, [8503] – 01, [8504] – 01, [8505] – 01, [8506] – 01, [8507] – 01, [8508] – 01, [8509] – 01

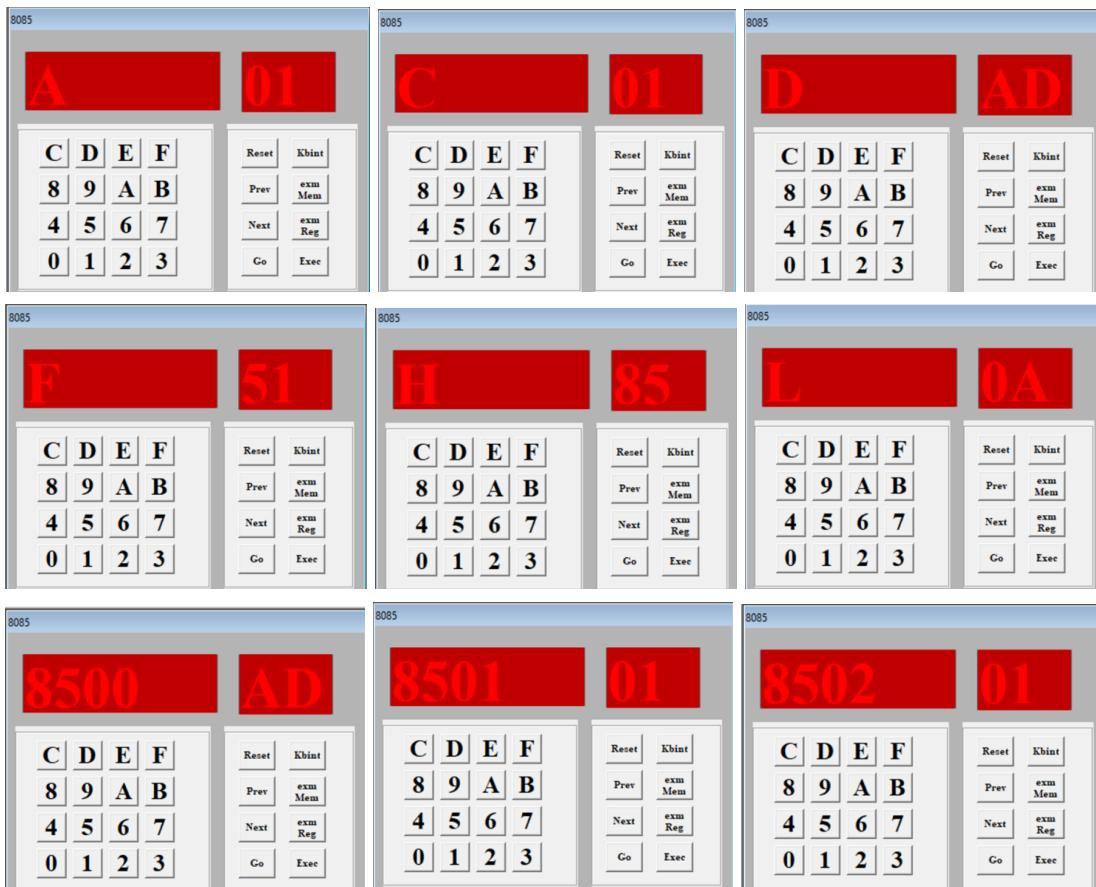
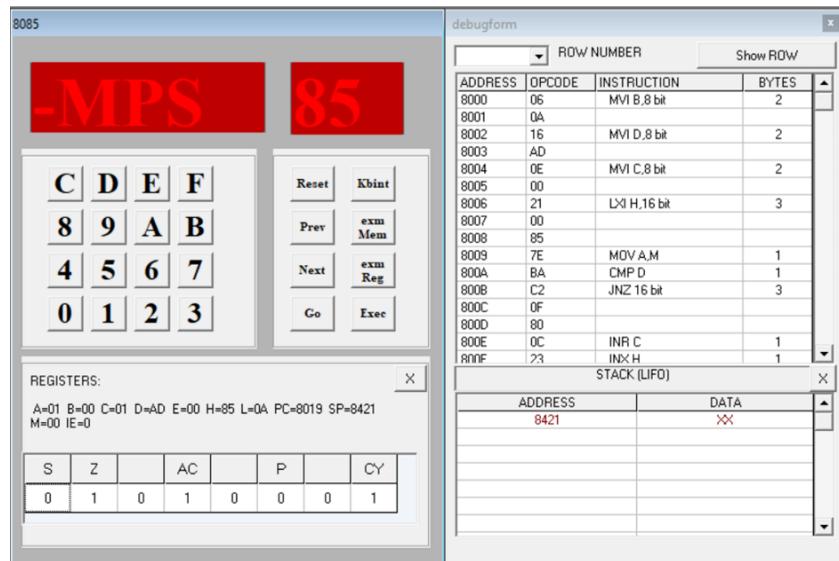
### Output:

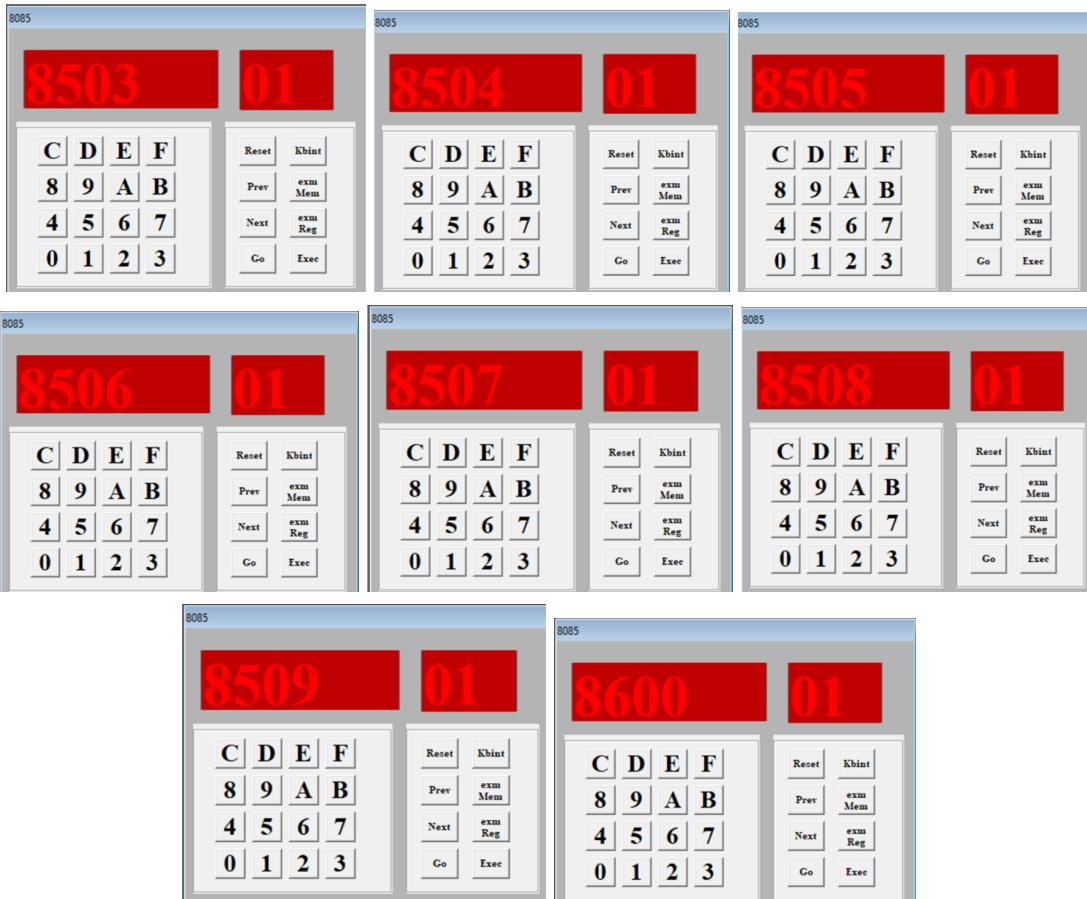
Registers: [A] – 01, [C] – 01, [D] – AD, [F] - 51 [H] – 85, [L] – [0A]

Memory Address: [8600] – 01

Flags: S – 0, Z – 1, AC – 1, P – 0, CY – 1







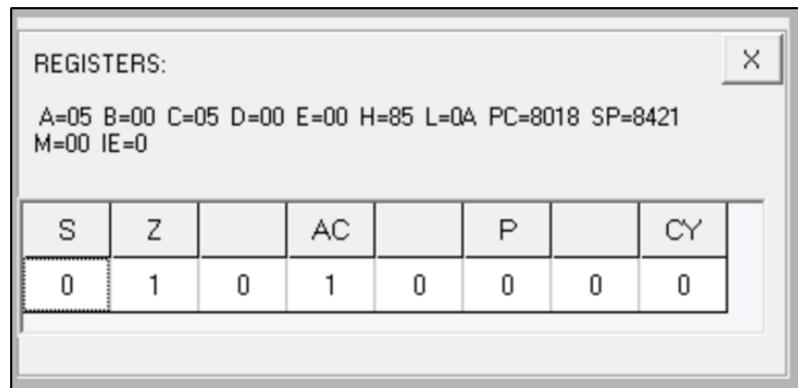
## Program No.12

**Aim:** Write an assembly language program to find the numbers of even parity in ten consecutive memory locations in 8085.

Code	Memory Location	Opcode
MVI B, 0A	8000, 8001	06, 0A
MVI C, 00	8002, 8003	0E, 00
LXI H, 8500H	8004, 8005, 8006	21, 00, 85
Back: MOV A, M	8007	7E
ANI FF	8008, 8009	E6, FF
JPO Next	800A, 800B, 800C	E2, 0E, 80
INR C	800D	0C
Next: INX H	800E	23
DCR B	800F	05
JNZ Back	8010, 8011, 8012	C2, 07, 80
MOV A, C	8013	79
STA 8600H	8014, 8015, 8016	32, 00, 86
RST 5	8017	EF

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

**Output:** [8600] - 05



8085

**8600**

**05**

C	D	E	F
8	9	A	B
4	5	6	7
0	1	2	3

Reset
Kbit

Prev
exm  
Mem

Next
exm  
Reg

Go
Exec

debugform

ROW NUMBER				Show ROW
ADDRESS	OPCODE	INSTRUCTION	BYTES	
8000	06	MVI B,8 bit	2	
8001	0A			
8002	0E	MVI C,8 bit	2	
8003	00			
8004	21	LXI H,16 bit	3	
8005	00			
8006	85			
8007	7E	MOV A,M	1	
8008	E6	ANI 8 bit	2	
8009	FF			
800A	E2	JPO 16 bit	3	
800B	0E			
800C	80			JUMPED TO 800E
800F	23	INX H	1	

STACK (LIFO)

ADDRESS	DATA
8421	XX

Registers:

A=05 B=00 C=05 D=00 E=00 H=85 L=0A PC=8018 SP=8421  
M=00 IE=0

S	Z		AC		P		CY
0	1	0	1	0	0	0	0

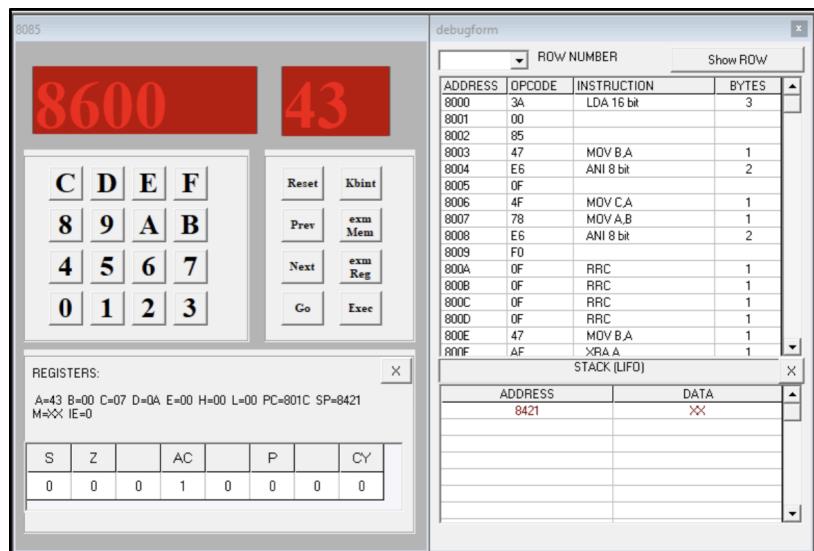
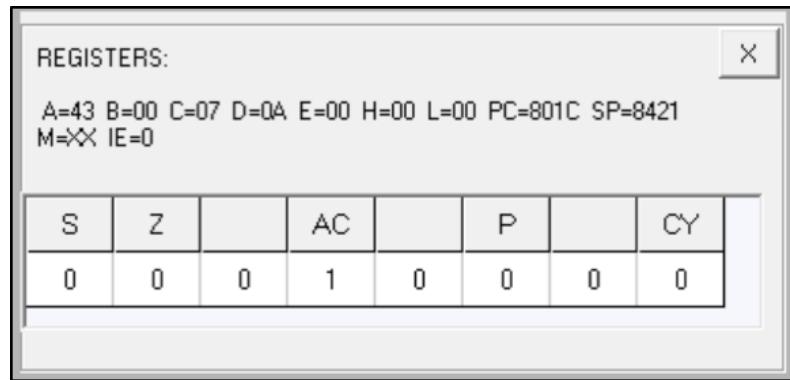
## Program No.13

**Aim:** Write an assembly language program to convert a BCD number into its equivalent binary in 8085.

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
MOV B, A	8003	47
ANI 0F	8004, 8005	E6, 0F
MOV C, A	8006	4F
MOV A, B	8007	78
ANI F0	8008, 8009	E6, F0
RRC	800A	0F
RRC	800B	0F
RRC	800C	0F
RRC	800D	0F
MOV B, A	800E	47
XRA A	800F	AF
MVI D, 0A	8010, 8011	16, 0A
Sum: ADD D	8012	82
DCR B	8013	05
JNZ Sum	8014, 8015, 8016	C2, 12, 80
ADD C	8017	81
STA 8600H	8018, 8019, 801A	32, 00, 86
RST 5	801B	EF

**Input:** [8500] - 67

**Output:** [8600] - 43



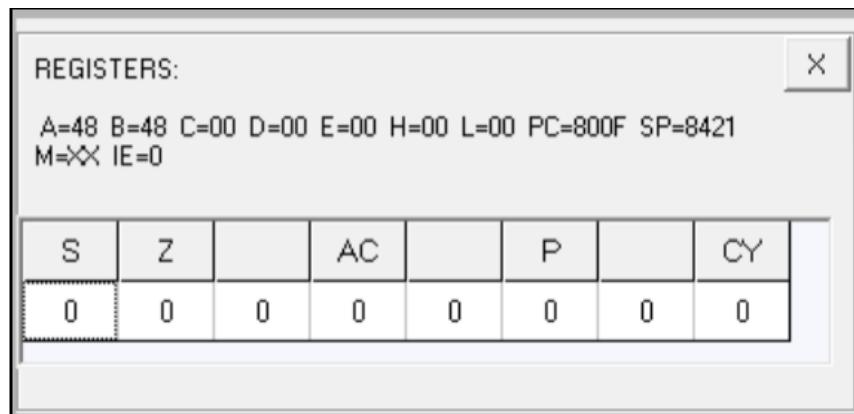
## Program No.14

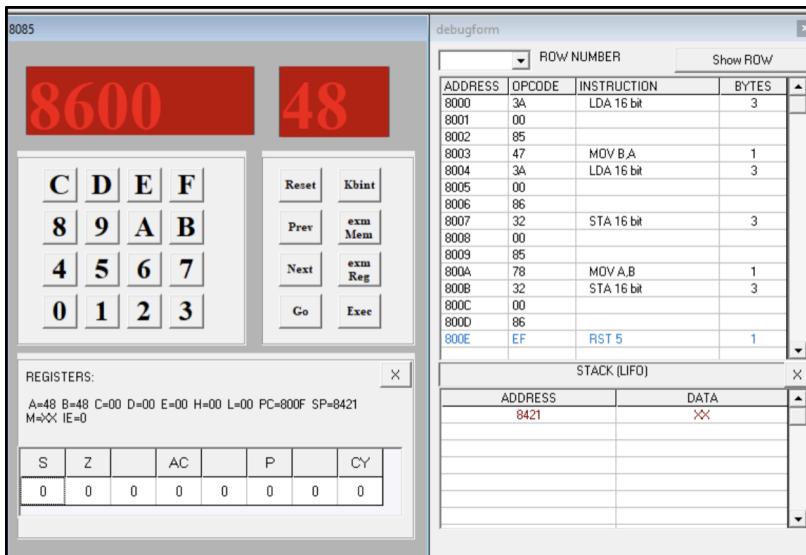
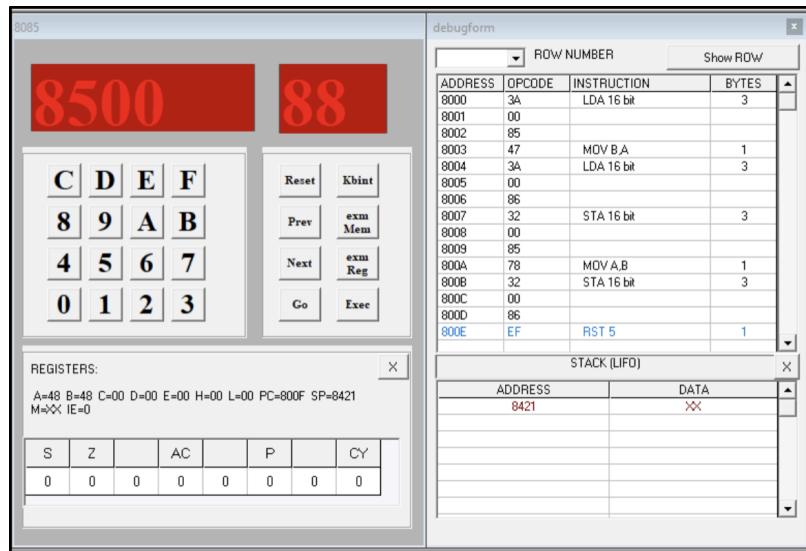
**Aim:** Write an ALP for exchange the contents of memory location

Code	Memory Location	Opcode
LDA 8500H	8000, 8001, 8002	3A, 00, 85
MOV B, A	8003	47
LDA 8600H	8004, 8005, 8006	3A, 00, 86
STA 8500H	8007, 8008, 8009	32, 00, 85
MOV A, B	800A	78
STA 8600H	800B, 800C, 800D	32, 00, 86
RST 5	800E	EF

**Input:** [8500] - 48, [8600] - 88

**Output:** [8500] - 88, [8600] - 48





## Program No.15

**Aim:** Write a program to find the largest number in an array of 10 elements.

Code	Memory Location	Opcode
MVI B, 09	8000, 8001	06, 09
LXI H, 8500H	8002, 8003, 8004	21, 00, 85
MOV A, M	8005	7E
INX H	8006	23
Back: CMP M	8007	BE
JNC Next	8008, 8009, 800A	D2, 0C, 80
MOV A, M	800B	7E
Next: INX H	800C	23
DCR B	800D	05
JNZ Back	800E, 800F, 8010	C2, 07, 80
STA 850AH	8011, 8012, 8013	32, 0A, 85
RST 5	8014	EF

**Input:** [8500] - 01, [8501] - 02, [8502] - 03, [8503] - 04, [8504] - 05, [8505] - 06, [8506] - 07, [8507] - 08, [8508] - 09, [8509] - 0A

**Output:** [850A] - 0A

