Questions  
ADD the contents of the memory locations 2000h and 2001h and place the result in memory location 4002h

SUBTRACT the contents of memory location 4001h from the memory location 2000h and place the result in memory location 4002h

3 find the 1st complements of the number stored at memory locatin 2000h and store the complement of the number at memory location 4300h

4 find the 2’s complement of the number store at memory location 4200h and store the complemented number at memory location 4300h

Wap to perform following operation of two numbers stored in 2000h and 2001h

A logical and, b logical or, c logical ex\_or

**Title: Arithmetic and Logical Operations on 8085**

**Objective**

To perform basic arithmetic and logical operations using the 8085 microprocessor on data stored in memory locations, and store the results back in memory.

# Experiment 1: Addition of Two Numbers

**Program:**

LDA 2000H

MOV B, A

LDA 2001H

ADD B

STA 4002H

HLT

**Flowchart:**

Start → Load [2000H] → A → Copy A to B → Load [2001H] → A

→ A = A + B → Store A to [4002H] → Stop

**Sample Input:**

| **Memory Address** | **Value** |
| --- | --- |
| 2000H | 05H |
| 2001H | 03H |

**Output:**

| **Register** | **Value** |
| --- | --- |
| A | 08H |
| B | 05H |

| **Memory Address** | **Value** |
| --- | --- |
| 4002H | 08H |

# Experiment 2: Subtraction

**Program:**

LDA 4001H

MOV B, A

LDA 2000H

SUB B

STA 4002H

HLT

**Flowchart:**

Start → Load [4001H] → A → Copy A to B → Load [2000H] → A

→ A = A - B → Store A to [4002H] → Stop

**Sample Input:**

| **Memory Address** | **Value** |
| --- | --- |
| 2000H | 09H |
| 4001H | 03H |

**Output:**

| **Register** | **Value** |
| --- | --- |
| A | 06H |
| B | 03H |

| **Memory Address** | **Value** |
| --- | --- |
| 4002H | 06H |

# Experiment 3: One’s Complement

**Program:**

LDA 2000H

CMA

STA 4300H

HLT

**Flowchart:**

Start → Load [2000H] → A → Complement A → Store A to [4300H] → Stop

**Sample Input:**

| **Memory Address** | **Value** |
| --- | --- |
| 2000H | 55H |

**Output:**

| **Register** | **Value** |
| --- | --- |
| A | AAH |

| **Memory Address** | **Value** |
| --- | --- |
| 4300H | AAH |

# Experiment 4: Two’s Complement

**Program:**

LDA 4200H

CMA

INR A

STA 4300H

HLT

**Flowchart:**

Start → Load [4200H] → A → 1’s Complement → A = A + 1

→ Store A to [4300H] → Stop

**Sample Input:**

| **Memory Address** | **Value** |
| --- | --- |
| 4200H | 10H |

**Output:**

| **Register** | **Value** |
| --- | --- |
| A | F0H |

| **Memory Address** | **Value** |
| --- | --- |
| 4300H | F0H |

# Experiment 5: Logical Operations

## (a) AND Operation

**Program:**

LDA 2000H

MOV B, A

LDA 2001H

ANA B

STA 2002H

HLT

**Flowchart:**

Start → Load [2000H] → A → Copy A to B → Load [2001H] → A

→ A = A AND B → Store A to [2002H] → Stop

**Input:**

| **Memory Address** | **Value** |
| --- | --- |
| 2000H | F0H |
| 2001H | 0FH |

**Output:**

| **Register** | **Value** |
| --- | --- |
| A | 00H |
| B | F0H |

| **Memory Address** | **Value** |
| --- | --- |
| 2002H | 00H |

## (b) XOR Operation

**Program:**

LDA 2000H

MOV B, A

LDA 2001H

XRA B

STA 2002H

HLT

**Flowchart:**

Start → Load [2000H] → A → Copy A to B → Load [2001H] → A

→ A = A XOR B → Store A to [2002H] → Stop

**Input:**

| **Memory Address** | **Value** |
| --- | --- |
| 2000H | 55H |
| 2001H | FFH |

**Output:**

| **Register** | **Value** |
| --- | --- |
| A | AAH |
| B | 55H |

| **Memory Address** | **Value** |
| --- | --- |
| 2002H | AAH |

## (c) OR Operation

**Program:**

LDA 2000H

MOV B, A

LDA 2001H

ORA B

STA 2002H

HLT

**Flowchart:**

Start → Load [2000H] → A → Copy A to B → Load [2001H] → A

→ A = A OR B → Store A to [2002H] → Stop

**Input:**

| **Memory Address** | **Value** |
| --- | --- |
| 2000H | 55H |
| 2001H | 0FH |

**Output:**

| **Register** | **Value** |
| --- | --- |
| A | 5FH |
| B | 55H |

| **Memory Address** | **Value** |
| --- | --- |
| 2002H | 5FH |

**✅ Conclusion**

Through this set of experiments, we successfully performed arithmetic (addition, subtraction), complement (1’s and 2’s), and bitwise logic operations (AND, OR, XOR) using the 8085 instruction set. Each operation involved using memory-mapped I/O and verified changes in registers and memory locations.