

Experiment Title: 3

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Branch: BE CSE

Semester: 4th

Subject Name: Microprocessor And Interfacing Lab

Subject Code:

UID: 20BCS7260

Section/Group:

Date of Performance:

1. Aim/Overview of the practical:

- Subtraction of two 8 bit numbers along with considering borrow

2. Task to be done:

Subtraction of two 8 bit numbers along with considering borrow

3. Apparatus/Simulator used (For applied/experimental sciences/materials based labs):

1. Jubin Application
2. 8085 Simulator
3. JDK

4. Algorithm/Flowchart (For programming based labs):

1. **Load the H-L pair with the address of first memory location.**
2. **Move the content of H-L to accumulator.**
3. **Increment H-L pair to next memory location.**
4. **Load the register B with the memory location of second data.**
5. **Initialize register C with 00H. this will store the borrow (if any).**
6. **Subtract the content of accumulator with the content of register B and the result will be stored in accumulator automatically.**
7. **If carry flag is set then increment register C.**
8. **Increment H-L pair.**
9. **Move result from accumulator to memory location 3002H.**
10. **Increment H-L pair.**
11. **Move borrow from register C to memory location 3003H.**

5. Description/ Code:

```
#BEGIN 000H  
MVI A,32H  
MVI B,43H  
SUB B  
HLT
```

6. Result/Output/Writing Summary:

8085 Simulator

File Edit Tools Settings Simulation Subroutine View Load Sample Program Help

Editor Assembler Registers Memory Devices

Assembler

* Address	Label	Mnemonics	Hexcode	Bytes	M-Cycles	T-States
✓ 0000		LXI H,1000	21	3	3	10
0001			00			
0002			10			
✓ 0003		MOV A,M	7E	1	2	7
✓ 0004		INX H	23	1	1	6
✓ 0005		MOV B,M	46	1	2	7
✓ 0006		MVI C,00	0E	2	2	7
0007			00			
✓ 0008		SUB B	90	1	1	4
✓ 0009		JNC JUMP	D2	3	3	10
000A			0D			
000B			00			
✓ 000C		INR C	0C	1	1	4
✓ 000D	JUMP	INX H	23	1	1	6
✓ 000E		MOV M,A	77	1	2	7
✓ 000F		INX H	23	1	1	6
✓ 0010		MOV M,C	71	1	2	7
✓ 0011		HLT	76	1	2	5

Simulate

Start From → 1000

Run all At a Time Step By Step

Memory Editor

Memory Range: 0000 ---- FFFF

Memory Address	Value
0000	21
0002	10
0003	7E
0004	23
0005	46
0006	0E
0008	90
0009	D2
000A	0D
000C	0C
000D	23
000E	77
000F	23
0010	71
0011	76
1000	96

☐ Show entire memory content
☒ Show only loaded memory location
☐ Store directly to specified memory location

1. Aim/Overview of the practical:

➤ Subtraction of two 16 bit numbers along with considering borrow

2. Task to be done:

Subtraction of two 16 bit numbers along with considering borrow

3. Apparatus/Simulator used :

1. Jubin Application



2. 8085 Simulator
3. JDK

4. Algorithm/Flowchart:

1. Load 0000H into CX register (for borrow)
2. Load the data into AX(accumulator) from memory 3000
3. Load the data into BX register from memory 3002
4. Subtract BX with Accumulator AX
5. Jump if no borrow
6. Increment CX by 1
7. Move data from AX(accumulator) to memory 3004
8. Move data from CX register to memory 3006
9. Stop

5. Description/ Code:

```
# BEGIN 0000  
    LHLD 3050  
    XCHG  
    LHLD 3052  
    MOV A,E  
    SUB L  
    MOV L,A  
    MOV A,D
```

SBB H

MOV H,A

SHLD 3054

HLT

ORG 3050H

DB 86H,94H,B0H,A7H

6. Result/Output/Writing Summary:

8085 Simulator

File Edit Tools Settings Simulation Subroutine View Load Sample Program Help

Editor Assembler

☐ Assembler

* Address	Label	Mnemonics	Hexcode	Bytes	M-Cycles	T-States
✓ 0000		LHLD 3050	2A	3	5	16
0001			50			
0002			30			
✓ 0003		XCHG	EB	1	1	4
✓ 0004		LHLD 3052	2A	3	5	16
0005			52			
0006			30			
✓ 0007		MOV A,E	7B	1	1	4
✓ 0008		SUB L	95	1	1	4
✓ 0009		MOV I,A	6F	1	1	4
✓ 000A		MOV A,D	7A	1	1	4
✓ 000B		SBB H	9C	1	1	4
✓ 000C		MOV H,A	67	1	1	4
✓ 000D		SHLD 3054	22	3	5	16
000E			54			
000F			30			
✓ 0010		HLT	76	1	2	5

☐ Simulate

Start From → 0000

Run all At a Time Step By Step

Registers Memory Devices

☐ Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	00	0	0	0	0	0	0	0	0
Register B	00	0	0	0	0	0	0	0	0
Register C	00	0	0	0	0	0	0	0	0
Register D	00	0	0	0	0	0	0	0	0
Register E	00	0	0	0	0	0	0	0	0
Register H	00	0	0	0	0	0	0	0	0
Register L	00	0	0	0	0	0	0	0	0
Memory(H)	00	0	0	0	0	0	0	0	0

Register	Value	S	Z	*	AC	*	P	*	CY
Flag Register	00	0	0	0	0	0	0	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	0000
Program Status Word(PSW)	0000
Program Counter(PC)	1000
Clock Cycle Counter	0
Instruction Counter	0

SOD	SID	INTR	TRAP	R7.5	R6.5	R5.5
0	0	0	0	0	0	0

For SIM instruction

SOD	SDE	*	R7.5	MSE	M7.5	M6.5	M5.5
0	0	0	0	0	0	0	0

For RIM instruction

SID	I7.5	I6.5	I5.5	IE	M7.5	M6.5	M5.5
0	0	0	0	0	0	0	0

Created by : Jubin Mitra

Learning outcomes (What I have learnt):

1. Working of microprocessors.
2. Learn how to do mathematical operations in microprocessors.
3. Learn about 8085 simulator.
4. Operations of 8 bit numbers.
5. Learn about the different instructions that are needed to be given to the memory to perform some tasks.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			