Worksheet 1.2

Student Name: Vivek Kumar
UID: 21BCS8129
Branch: BE-CSE (LEET)
Section/Group: 20BCS-809/A
Semester: 4th Sem
Date of Performance: 20/02/2022
Subject Name: MPI Lab
Subject Code: 20CSP-253

1. Aim/Overview of the practical:

Addition of two 16bit numbers, sum 8 bits.

2. Task to be done:

Write the 8085 Micro Processor program to calculate the addition of two 16bit numbers.

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

Software Requirements:

I. 8085 Jubin simulator version 2 (Microprocessor Simulator)
II. Java (jdk/ jre1.8.0_321)

Hardware Requirements:

I. Processor –Any suitable Processor
II. Main Memory - 128 MB RAM
III. Hard Disk –minimum 20 GB IDE Hard Disk
IV. Removable Drives–1.44 MB Floppy Disk Drive –52X IDE CD-ROM Drive
V. PS/2HCL Keyboard and Mouse

4. Algorithm (For programming-based labs)**:**

Algorithm:

I. Load the first number pair from memory location 3000 and 3001 to HL Pair.
II. Exchange The HL content to DE Pair.
III. Load the first number pair from memory location 3002 and 3003 to HL Pair.
IV. Move the content of E register to accumulator.
V. Add L register and store in Accumulator.
VI. Move the content of accumulator to L register.
VII. Move the content of D register to accumulator.
VIII. Add H register and store in Accumulator.
IX. Move the content of accumulator to H register.
X. Store the HL pair data in Memory address 3004 and 3005.

5. Description/ Code:

Example: 1

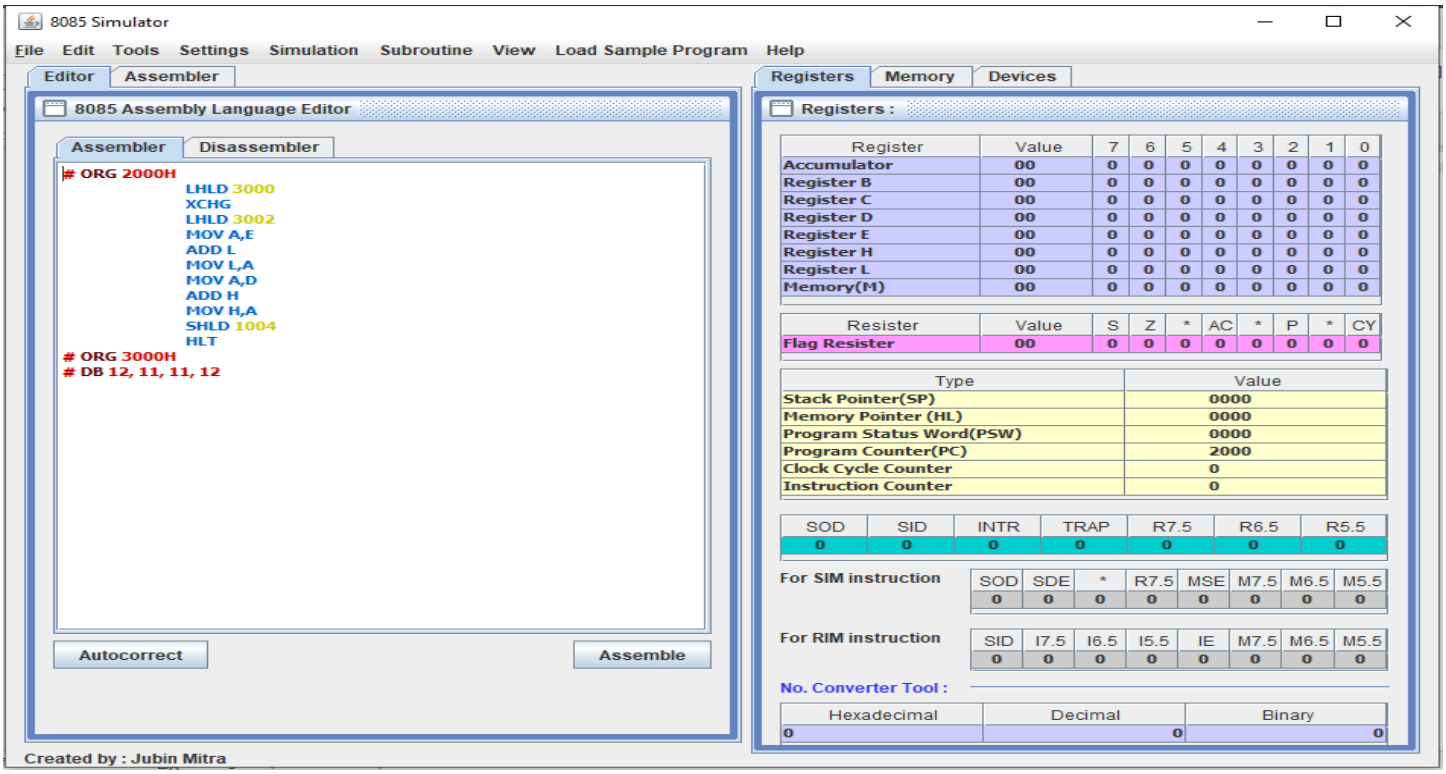
```
# ORG 2000H
        LHLD 3000
        XCHG
        LHLD 3002
        MOV A,E
        ADD L
        MOV L,A
        MOV A,D
        ADD H
        MOV H,A
        SHLD 1004
        HLT
# ORG 3000H
# DB 12, 11, 11, 12
```

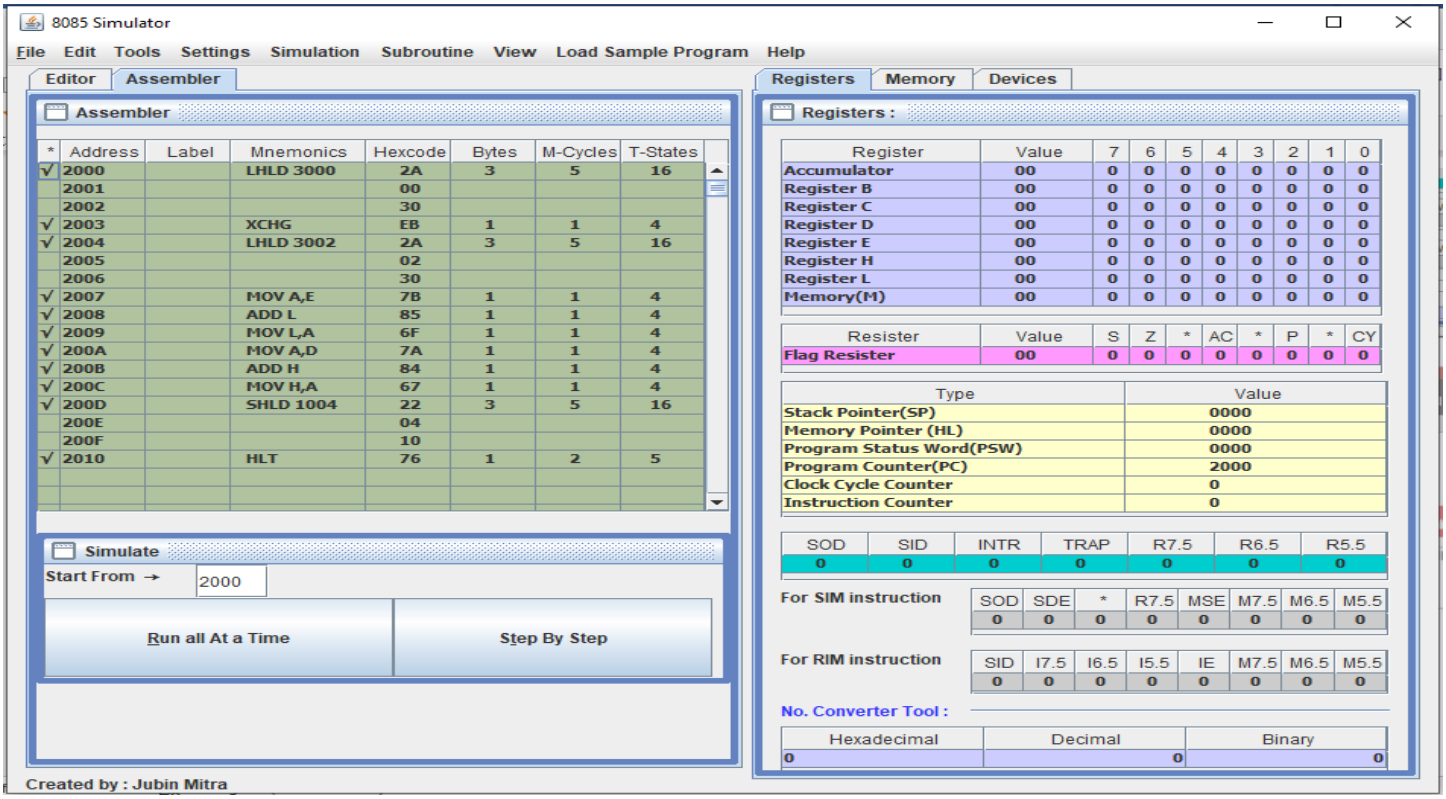
Example: 2

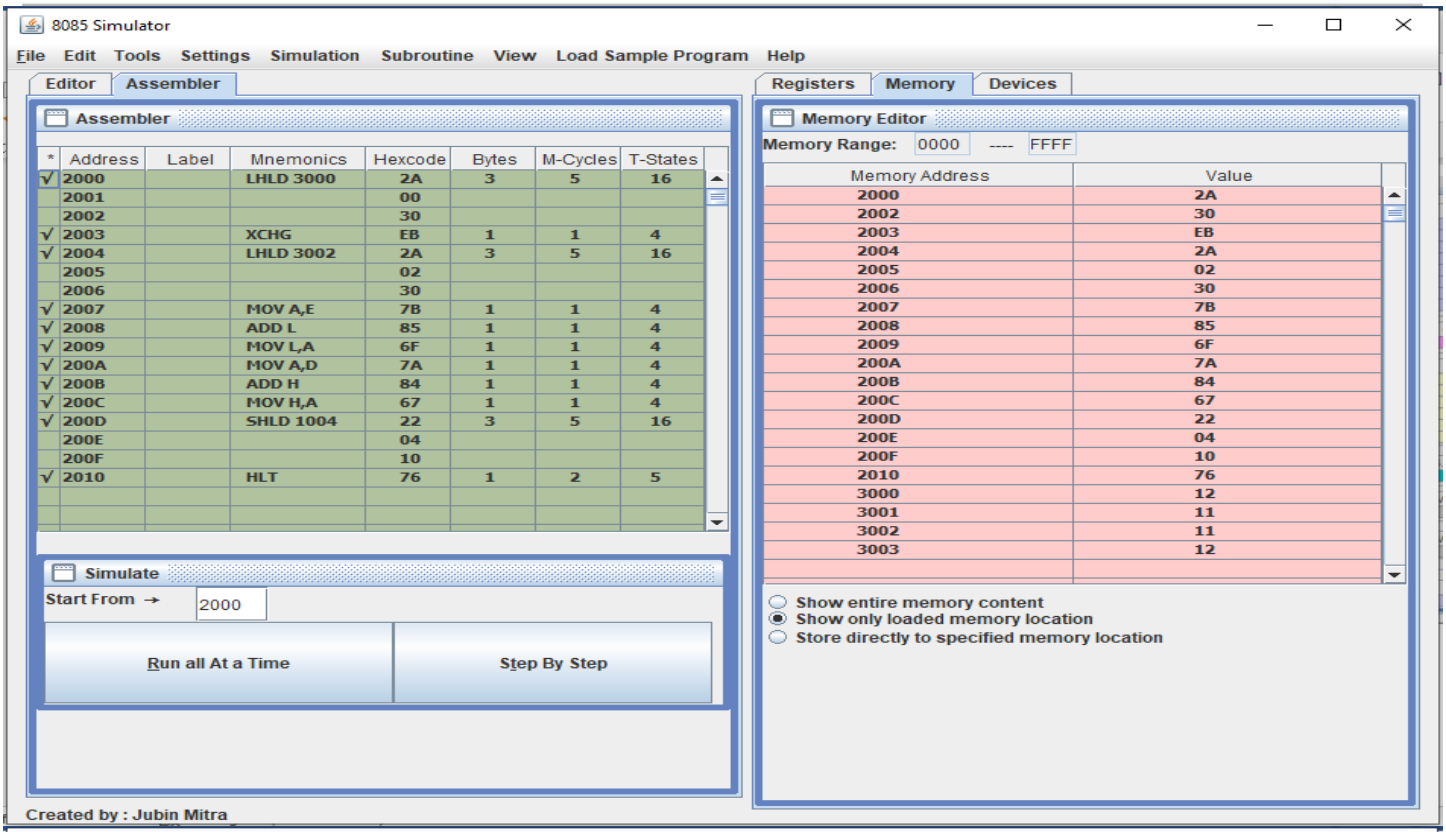
```
# ORG 2000H
        LHLD 3000
        XCHG
        LHLD 3002
        DAD D
        SHLD 3004
        HLT
# ORG 3000H
# DB 12,42,99,12
```

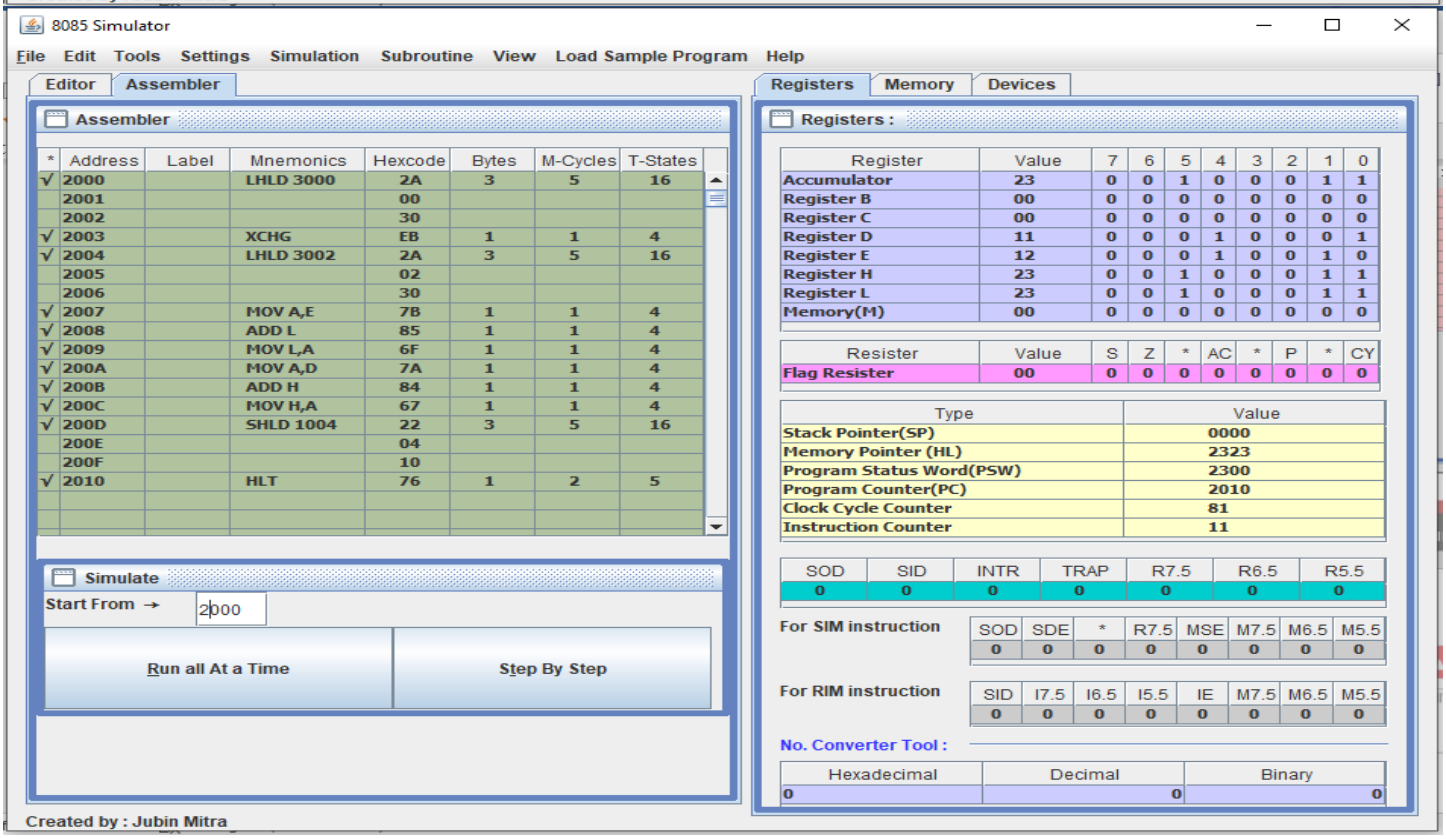
6. Result/Output/Writing Summary:

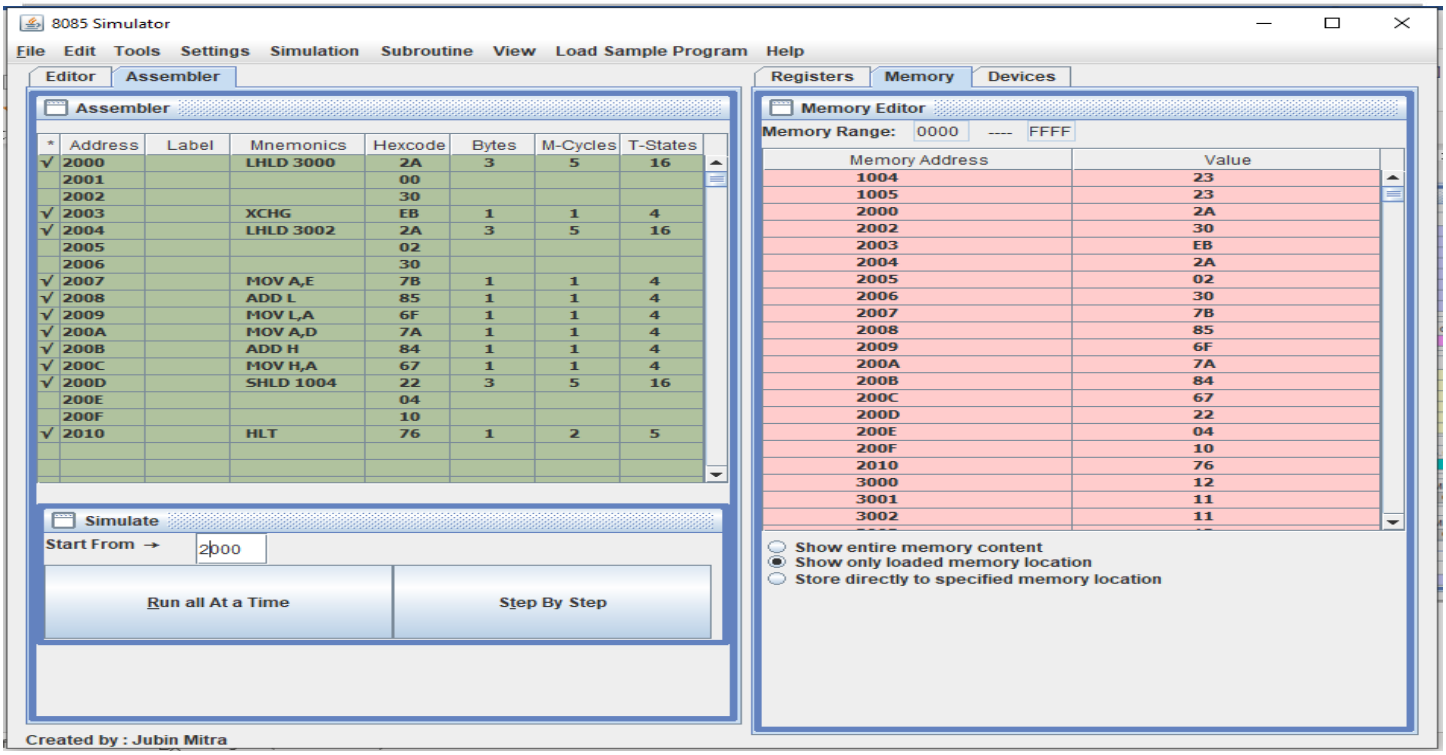
Example: 1



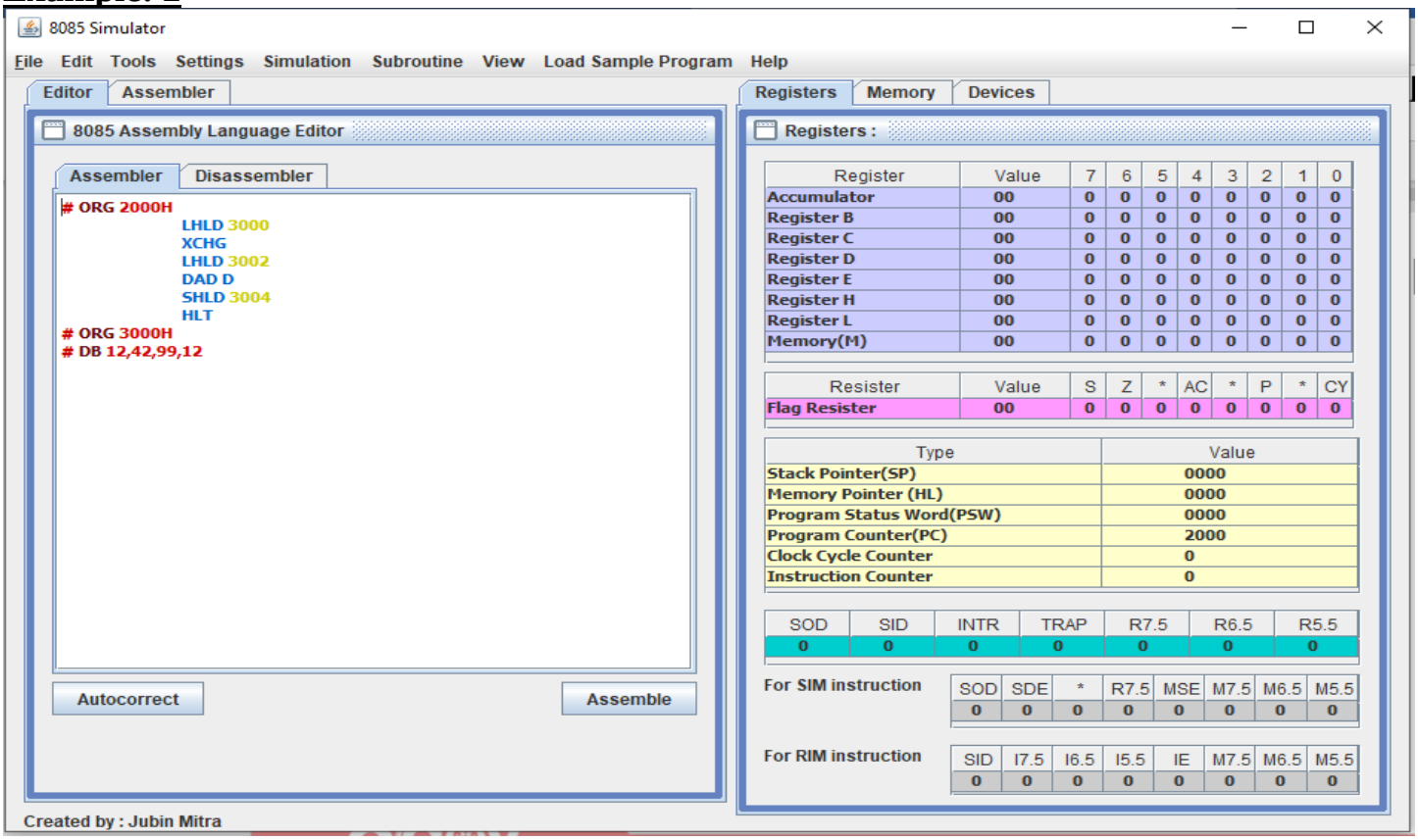


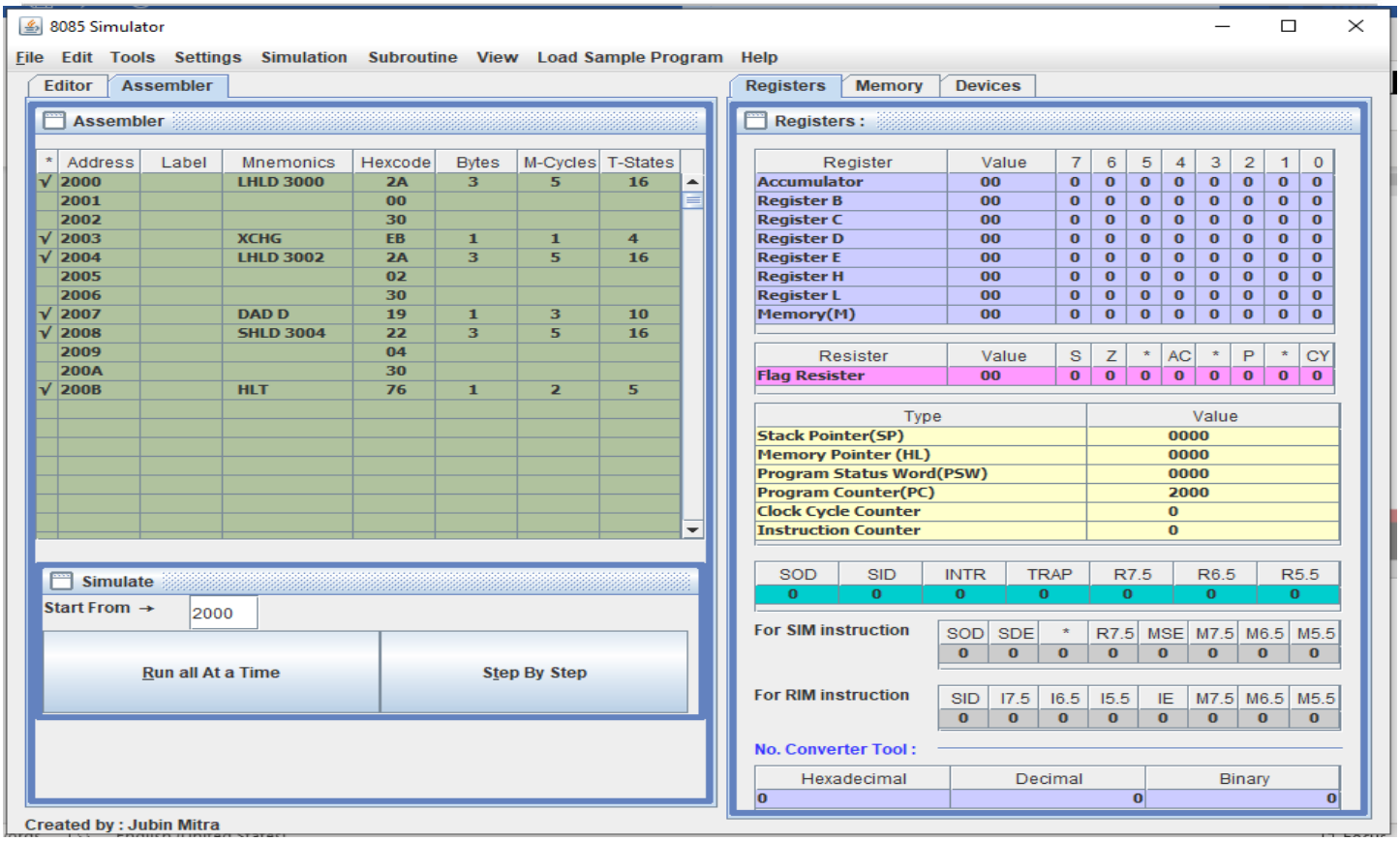

8085 Simulator
File Edit Tools Settings Simulation Subroutine View Load Sample Program Help
Editor Assembler
Assembler
Registers Memory Devices
Memory Editor
Memory Range: 0000 ---- FFFF
Memory Address Value
2000 2A
2002 30
2003 EB
2004 2A
2005 02
2006 30
2007 7B
2008 85
2009 6F
200A 7A
200B 84
200C 67
200D 22
200E 04
200F 10
2010 76
3000 12
3001 11
3002 11
3003 12
Show entire memory content
Show only loaded memory location
Store directly to specified memory location
* Address Label Mnemonics Hexcode Bytes M-Cycles T-States
√ 2000 LHLD 3000 2A 3 5 16
2001 00
2002 30
√ 2003 XCHG EB 1 1 4
√ 2004 LHLD 3002 2A 3 5 16
2005 02
2006 30
√ 2007 MOV A,E 7B 1 1 4
√ 2008 ADD L 85 1 1 4
√ 2009 MOV L,A 6F 1 1 4
√ 200A MOV A,D 7A 1 1 4
√ 200B ADD H 84 1 1 4
√ 200C MOV H,A 67 1 1 4
√ 200D SHLD 1004 22 3 5 16
200E 04
200F 10
√ 2010 HLT 76 1 2 5
Simulate
Start From → 2000
Run all At a Time
Step By Step
Created by : Jubin Mitra


8085 Simulator
File Edit Tools Settings Simulation Subroutine View Load Sample Program Help
Editor Assembler
Assembler
Registers Memory Devices
Registers :
Register Value 7 6 5 4 3 2 1 0
Accumulator 23 0 0 1 0 0 0 1 1
Register B 00 0 0 0 0 0 0 0 0
Register C 00 0 0 0 0 0 0 0 0
Register D 11 0 0 0 1 0 0 0 1
Register E 12 0 0 0 1 0 0 1 0
Register H 23 0 0 1 0 0 0 1 1
Register L 23 0 0 1 0 0 0 1 1
Memory(M) 00 0 0 0 0 0 0 0 0
Resister Value S Z * AC * P * CY
Flag Resister 00 0 0 0 0 0 0 0 0
Type Value
Stack Pointer(SP) 0000
Memory Pointer (HL) 2323
Program Status Word(PSW) 2300
Program Counter(PC) 2010
Clock Cycle Counter 81
Instruction Counter 11
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
No. Converter Tool :
Hexadecimal Decimal Binary
0 0 0
* Address Label Mnemonics Hexcode Bytes M-Cycles T-States
√ 2000 LHLD 3000 2A 3 5 16
2001 00
2002 30
√ 2003 XCHG EB 1 1 4
√ 2004 LHLD 3002 2A 3 5 16
2005 02
2006 30
√ 2007 MOV A,E 7B 1 1 4
√ 2008 ADD L 85 1 1 4
√ 2009 MOV L,A 6F 1 1 4
√ 200A MOV A,D 7A 1 1 4
√ 200B ADD H 84 1 1 4
√ 200C MOV H,A 67 1 1 4
√ 200D SHLD 1004 22 3 5 16
200E 04
200F 10
√ 2010 HLT 76 1 2 5
Simulate
Start From → 2000
Run all At a Time
Step By Step
Created by : Jubin Mitra


8085 Simulator
File Edit Tools Settings Simulation Subroutine View Load Sample Program Help
Editor Assembler
Assembler
Registers Memory Devices
Memory Editor
Memory Range: 0000 ---- FFFF
Simulate
Start From → 2000
Run all At a Time
Step By Step
Show entire memory content
Show only loaded memory location
Store directly to specified memory location
Created by : Jubin Mitra

Example: 2


8085 Simulator
File Edit Tools Settings Simulation Subroutine View Load Sample Program Help
Editor Assembler
8085 Assembly Language Editor
Assembler Disassembler
ORG 2000H
LHLD 3000
XCHG
LHLD 3002
DAD D
SHLD 3004
HLT
ORG 3000H
DB 12,42,99,12
Autocorrect
Assemble
Registers Memory Devices
Registers :
Register Value 7 6 5 4 3 2 1 0
Accumulator 00
Register B 00
Register C 00
Register D 00
Register E 00
Register H 00
Register L 00
Memory(M) 00
Resister Value S Z * AC * P * CY
Flag Resister 00
Type Value
Stack Pointer(SP) 0000
Memory Pointer (HL) 0000
Program Status Word(PSW) 0000
Program Counter(PC) 2000
Clock Cycle Counter 0
Instruction Counter 0
SOD SID INTR TRAP R7.5 R6.5 R5.5
For SIM instruction
SOD SDE * R7.5 MSE M7.5 M6.5 M5.5
For RIM instruction
SID I7.5 I6.5 I5.5 IE M7.5 M6.5 M5.5
Created by : Jubin Mitra



*	Address	Label	Mnemonics	Hexcode	Bytes	M-Cycles	T-States
√	2000		LHLD 3000	2A	3	5	16
	2001			00			
	2002			30			
√	2003		XCHG	EB	1	1	4
√	2004		LHLD 3002	2A	3	5	16
	2005			02			
	2006			30			
√	2007		DAD D	19	1	3	10
√	2008		SHLD 3004	22	3	5	16
	2009			04			
	200A			30			
√	200B		HLT	76	1	2	5

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(M)	00	0	0	0	0	0	0	0	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	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)	2000
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

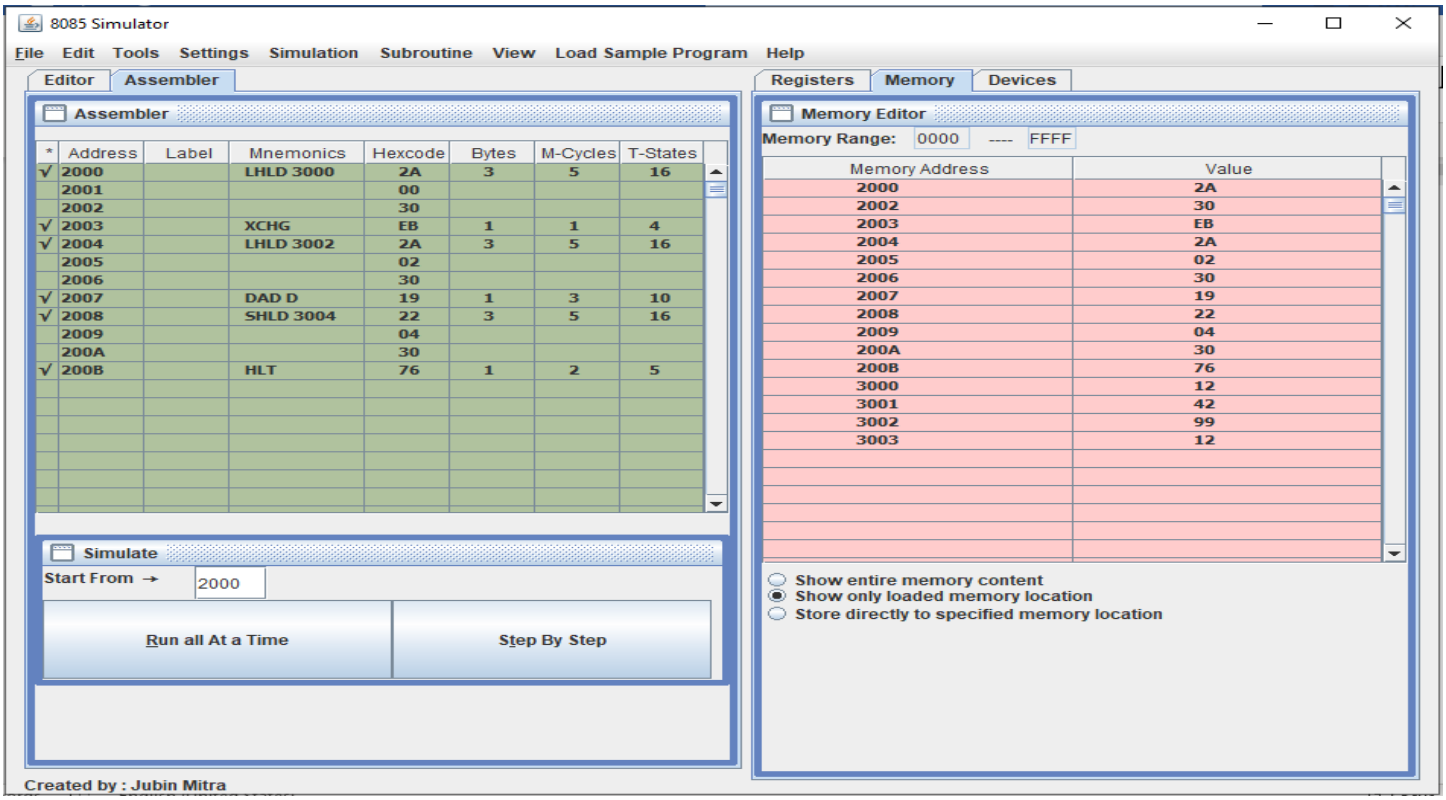
SOD	SDE	*	R7.5	MSE	M7.5	M6.5	M5.5
0	0	0	0	0	0	0	0

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

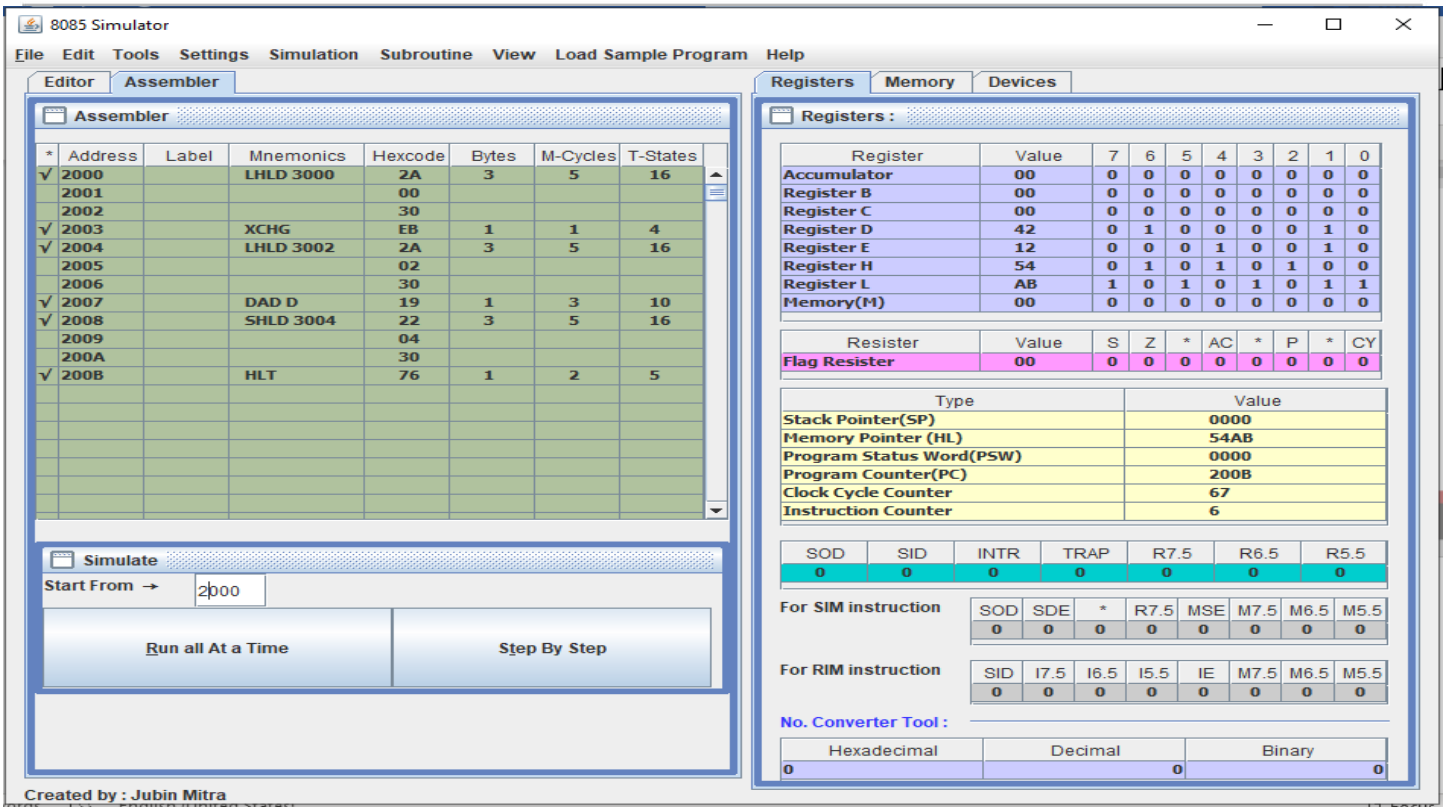
No. Converter Tool :

Hexadecimal	Decimal	Binary
0	0	0



*	Address	Label	Mnemonics	Hexcode	Bytes	M-Cycles	T-States
√	2000		LHLD 3000	2A	3	5	16
	2001			00			
	2002			30			
√	2003		XCHG	EB	1	1	4
√	2004		LHLD 3002	2A	3	5	16
	2005			02			
	2006			30			
√	2007		DAD D	19	1	3	10
√	2008		SHLD 3004	22	3	5	16
	2009			04			
	200A			30			
√	200B		HLT	76	1	2	5

Memory Address	Value
2000	2A
2002	30
2003	EB
2004	2A
2005	02
2006	30
2007	19
2008	22
2009	04
200A	30
200B	76
3000	12
3001	42
3002	99
3003	12



*	Address	Label	Mnemonics	Hexcode	Bytes	M-Cycles	T-States
√	2000		LHLD 3000	2A	3	5	16
	2001			00			
	2002			30			
√	2003		XCHG	EB	1	1	4
√	2004		LHLD 3002	2A	3	5	16
	2005			02			
	2006			30			
√	2007		DAD D	19	1	3	10
√	2008		SHLD 3004	22	3	5	16
	2009			04			
	200A			30			
√	200B		HLT	76	1	2	5

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	42	0	1	0	0	0	0	1	0
Register E	12	0	0	0	1	0	0	1	0
Register H	54	0	1	0	1	0	1	0	0
Register L	AB	1	0	1	0	1	0	1	1
Memory(M)	00	0	0	0	0	0	0	0	0

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

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	54AB
Program Status Word(PSW)	0000
Program Counter(PC)	200B
Clock Cycle Counter	67
Instruction Counter	6

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

For SIM instruction

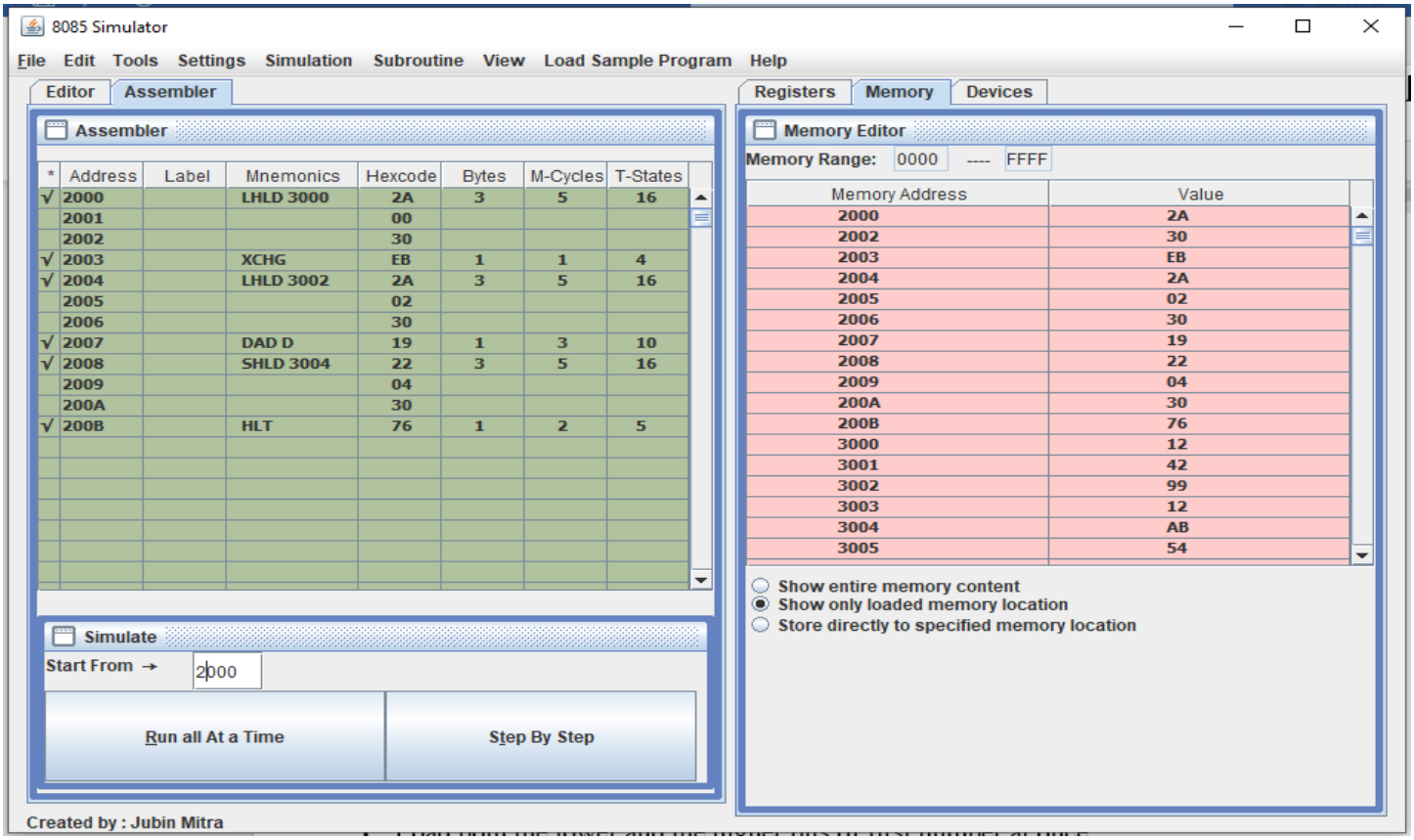
SOD	SDE	*	R7.5	MSE	M7.5	M6.5	M5.5
0	0	0	0	0	0	0	0

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

No. Converter Tool :

Hexadecimal	Decimal	Binary
0	0	0



*	Address	Label	Mnemonics	Hexcode	Bytes	M-Cycles	T-States
√	2000		LHLD 3000	2A	3	5	16
	2001			00			
	2002			30			
√	2003		XCHG	EB	1	1	4
√	2004		LHLD 3002	2A	3	5	16
	2005			02			
	2006			30			
√	2007		DAD D	19	1	3	10
√	2008		SHLD 3004	22	3	5	16
	2009			04			
	200A			30			
√	200B		HLT	76	1	2	5

Memory Address	Value
2000	2A
2002	30
2003	EB
2004	2A
2005	02
2006	30
2007	19
2008	22
2009	04
200A	30
200B	76
3000	12
3001	42
3002	99
3003	12
3004	AB
3005	54

Learning outcomes (What I have learnt):

1. Learnt how to do the 8085-microprocessor programming.

2. Learnt how to add the two 16bit numbers.

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.			