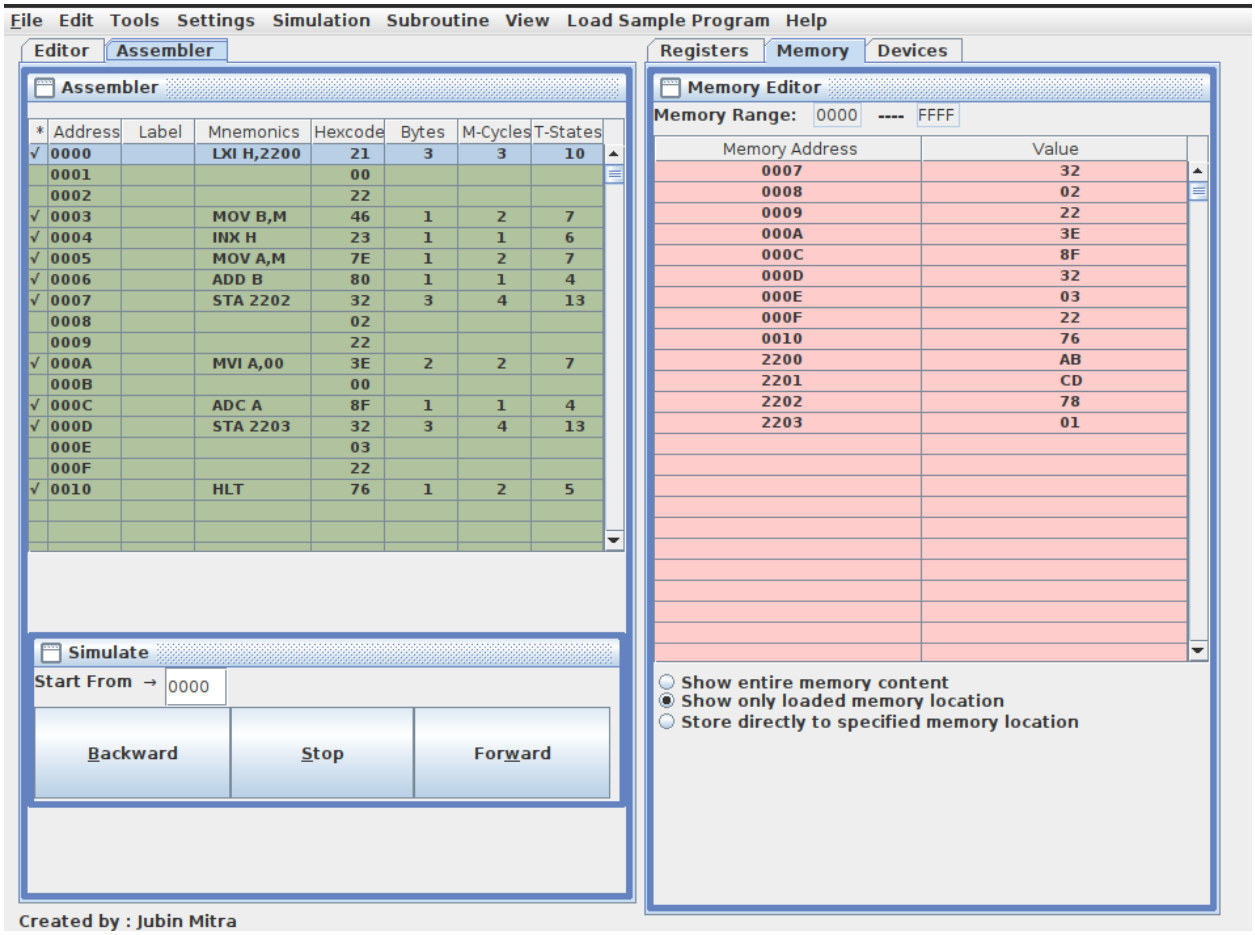
Name : Debargha Mukherjee **Batch** : BCSE Second Year Second Semester , 2021
Experiments in Microprocessors Lab , Assignment Sheet #1

1. Load the contents of the memory locations 2200 H and 2201 H into registers. Add these registers and store the result in memory locations 2202 H and 2203 H .

Line #	Address in Hex	Label	Instruction (Mnemonics)	Opcode in Hex	Remarks
1.	0000		LXI H, 2200H	21	Address of the first number loaded in HL register pair
	0001			00	
	0002			22	
2.	0003		MOV B, M	46	B = M[HL]
3.	0004		INX H	23	HL = 2201H
4.	0005		MOV A, M	7E	A = M[HL]
5.	0006		ADD B	80	A = A + B
6.	0007		STA 2202H	32	Load the contents of the accumulator in the address location 2202H, M[2202] = A
	0008			02	
	0009			22	
7.	000A		MVI A, 00H	3E	Load the accumulator with zero value
	000B			00	
8.	000C		ADC A	8F	Move the carry into A
9.	000D		STA 2203H	32	Load the contents of the accumulator in the address location 2202H, M[2203] = A
	000E			03	
	000F			22	
10.	0010		HLT	76	Halt the entire program

Results generated from sim8085 designed by Jubin Mitra

M[2200H] = ABH , M[2201H] = CDH, therefore M[2202H] = 78H, M[2203H] = 01H



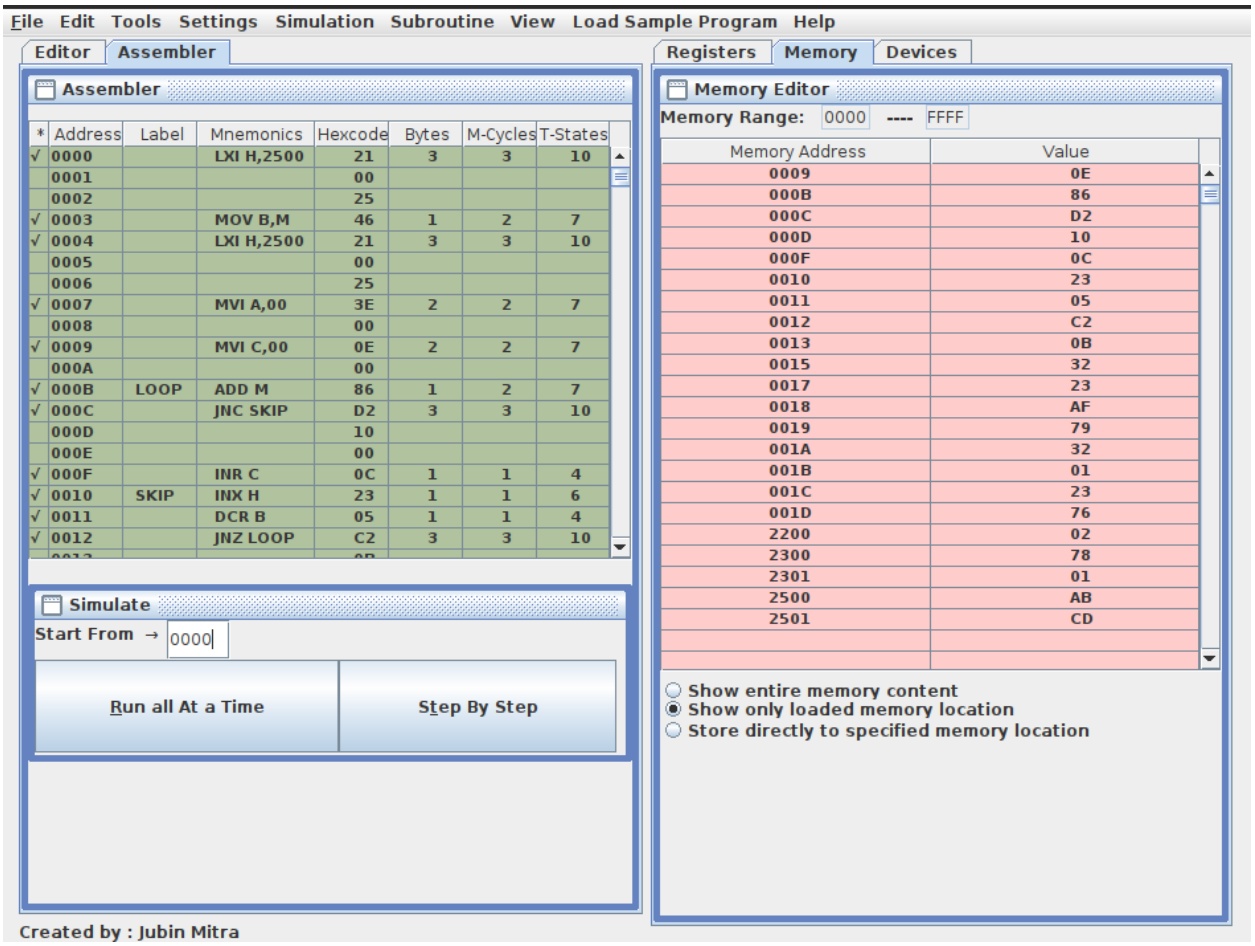
2. Find the sum of N numbers stored in consecutive locations starting from 2500 H .The value of N is stored in 2200 H . Store the result in locations 2300 H and 2301 H.

Line #	Address in Hex	Label	Instruction (Mnemonics)	Opcode in Hex	Remarks
1.			LXI H, 2500H	21	Store the contents of memory location 2200H into the HL register pair.
				00	
				25	
2.			MOV B, M	46	B = M[HL]
3.			LXI H, 2500H	21	Store the contents of memory location 2500H into the HL

				00	register pair.
				25	
4.			MVI A, 00H	3E	Load the accumulator with zero value
				00	
5.			MVI C, 00H	0E	Load the register C with zero value
				00	
6.		LOOP	ADD M	86	A = A + M[HL]
7.			JNC SKIP	D2	If no carry is generated , directly jump to label SKIP
				10	
				00	
8.			INR C	0C	Increment C for Carry
9.		SKIP	INX H	23	Move to the next address
10.			DCR B	05	Decrement the value in B
11.			JNZ LOOP	C2	Continue the loop till zero elements are left
				0B	
				00	
12.			STA 2300H	32	Load the contents of the accumulator in the address location 2300H, M[2300] = A
				00	
				23	
13.			XRA A	AF	A xor A ; A = 0
14.			MOV A, C	79	A = C
15.			STA 2301H	32	Load the contents of the accumulator in the address location 2301H, M[2301] = A
				01	
				23	
16.			HLT	76	Stop the program

Results generated from sim8085 designed by Jubin Mitra

M[M[2500H] = ABH , M[2501H] = CDH, and M[2200H] = 2, therefore M[2300H] = 78H, M[2301H] = 01H



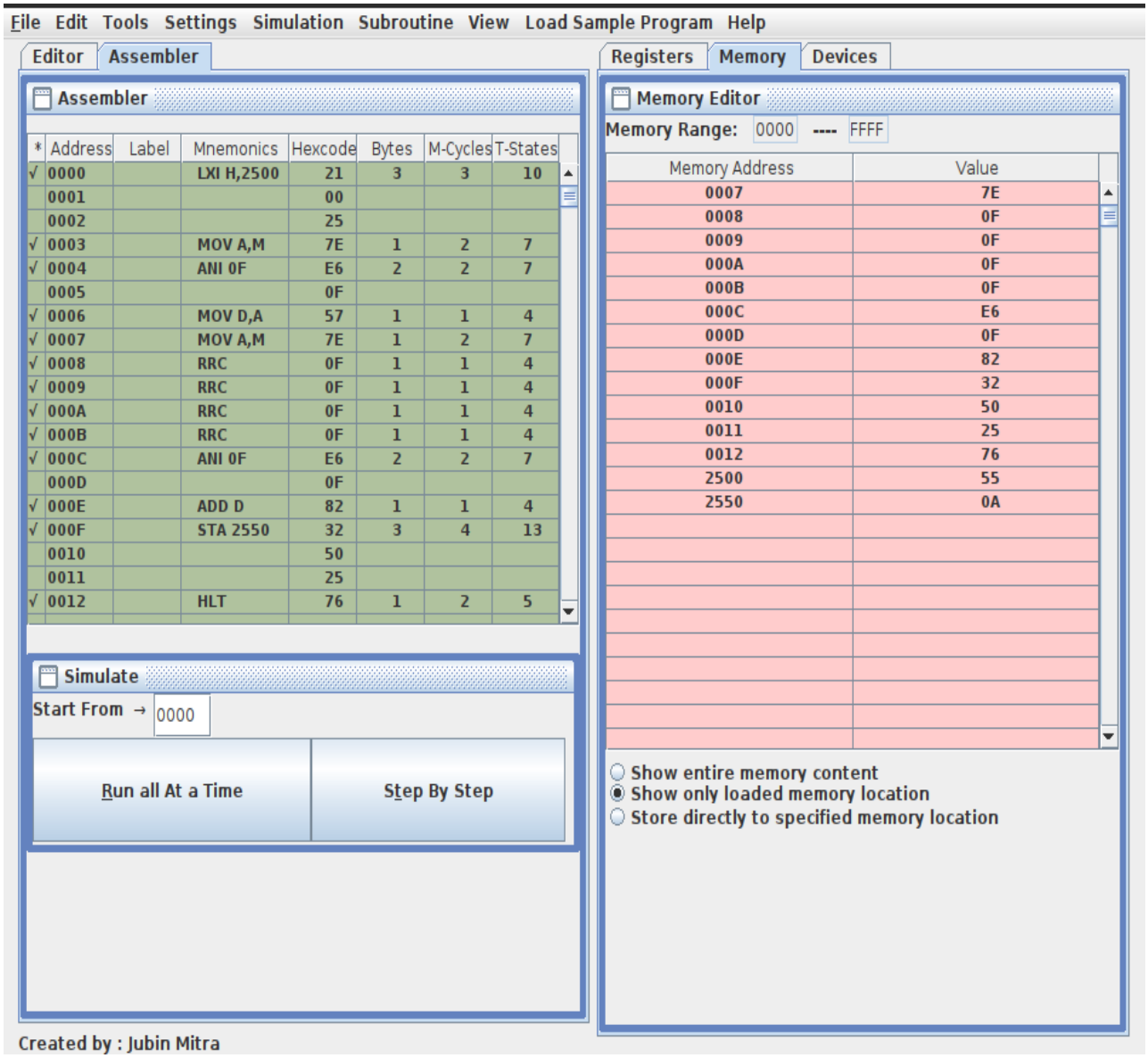
3. Find the sum of the least significant 4 bits and most significant 4 bits of a byte stored in memory location 2500 H . Store the result in 2550 H .

Line #	Address in Hex	Label	Instruction (Mnemonics)	Opcode in Hex	Remarks
1.			LXI H, 2500H	21	Contents of memory location 2500H into HL register pair
				00	
				25	
2.			MOV A, M	7E	A = M[HL]
3.			ANI 0FH	E6	A = A & (0000 1111)

				0F	
4.			MOV D, A	57	D = A
5.			MOV A, M	7E	A = M[HL]
6.			RRC	0F	Rotate bits of accumulator right without carry bit
7.			RRC	0F	Rotate bits of accumulator right without carry bit
8.			RRC	0F	Rotate bits of accumulator right without carry bit
9.			RRC	0F	Rotate bits of accumulator right without carry bit
10.			ANI 0FH	E6	A = A & (0000 1111)
				0F	
11.			ADD D	82	A = A + D
12.			STA 2550H	32	Load the contents of the accumulator in the address location 2550H, M[2550] = A
				50	
				25	
13.			HLT	76	Stop the program

Results generated from sim8085 designed by Jubin Mitra

M[2500] = 55H, therefor M[2550] = 0AH (0101 + 0101 = 1010)

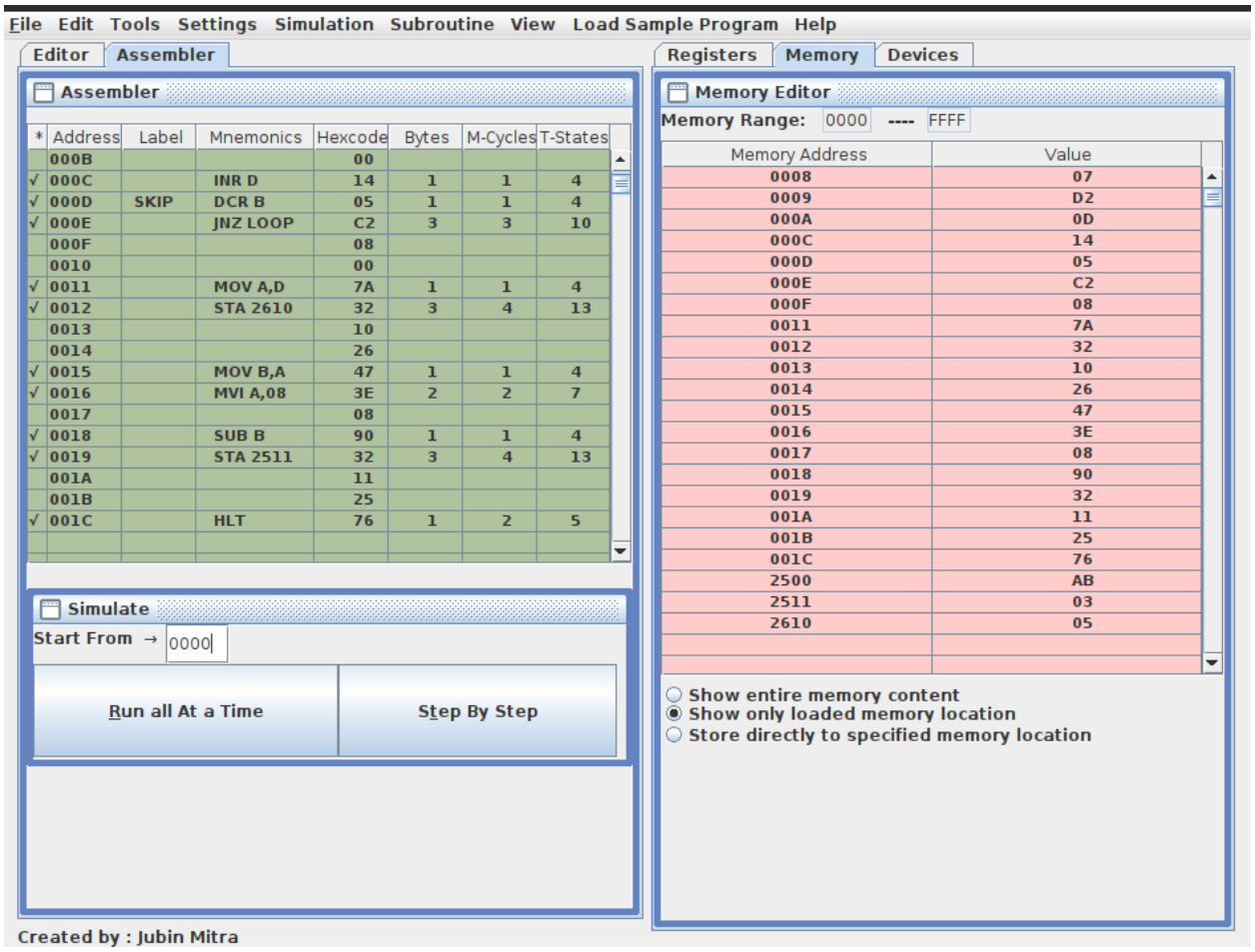


4. Write a program to count the ‘1’s and ‘0’s of a byte stored in 2500 H . Store the result in 2610 H and 2511 H , respectively

Line #	Address in Hex	Label	Instruction (Mnemonics)	Opcode in Hex	Remarks
1.	0000		LXI H, 2500H	21	Contents of memory location 2500H into HL register pair
	0001			00	
	0002			25	

2.	0003		MOV A, M	7E	A = M
3.	0004		MVI B, 08H	06	B = 08H
	0005			08	
4.	0006		MVI D, 00H	16	D = 00H
	0007			00	
5.	0008	LOOP	RLC	07	Rotate accumulator left without carry
6.	0009		JNC SKIP	D2	If no carry is generated then jump to label skip
	000A			0D	
	000B			00	
7.	000C		INR D	14	D = D + 1 (to get the one count)
8.	000D	SKIP	DCR B	05	B = B - 1
9.	000E		JNZ LOOP	C2	If content of B is not zero then jump to the label LOOP , we need to continue this 8 times to get the count of all set bits
	000F			08	
	0010			00	
10.	0011		MOV A, D	7A	A = D
11.	0012		STA 2610H	32	Load the contents of the accumulator in the address location 2610H, M[2610] = A (store the number of ones)
	0013			10	
	0014			26	
12.	0015		MOV B, A	47	B = A
13.	0016		MVI A, 08H	3E	A = 08H
	0017			08	
14.	0018		SUB B	90	A = A - B (to get the zero count)
15.	0019		STA 2511H	32	Load the contents of the accumulator in the address location 2511H, M[2511] = A (store the number of zeroes)
	001A			11	
	001B			25	
16.	001C		HLT	76	Stop the program

Results generated from sim8085 designed by Jubin Mitra
M[2500] = ABH (1010 1011) therefore, M[2610] = 05H and M[2511] = 03H



5. Write a program to sum two 16-bits binary numbers.

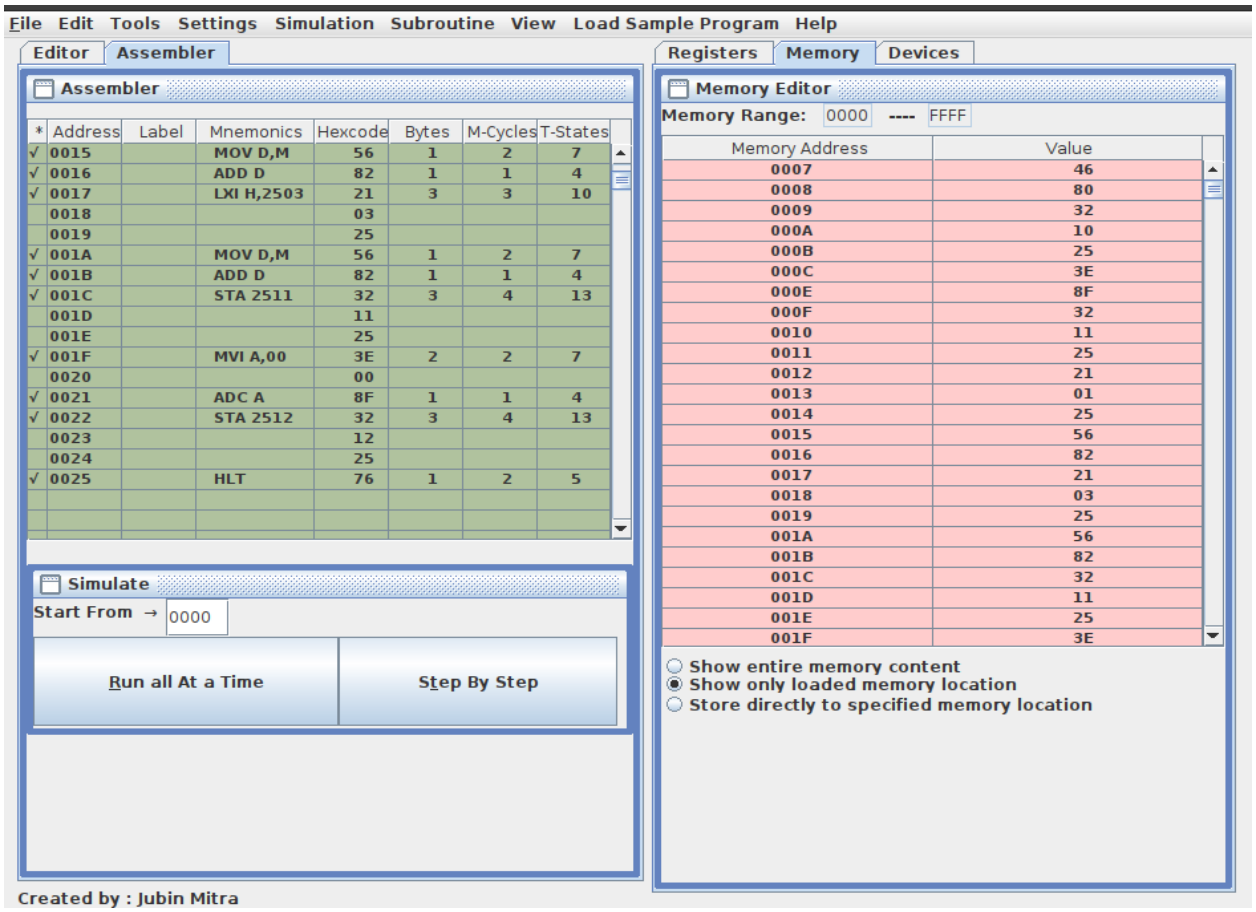
Line #	Address in Hex	Label	Instruction (Mnemonics)	Opcode in Hex	Remarks
1.	0000		LXI H, 2500H	21	Contents of memory location 2500H into HL register pair
	0001			00	
	0002			25	

2.	0003		MOV A, M	7E	A = M[HL]
3.	0004		LXI H, 2502	21	Contents of memory location 2502H into HL register pair
	0005			02	
	0006			25	
	0007		MOV B, M	46	B = M[HL]
4.	0008		ADD B	80	A = A + B
5.	0009		STA 2510	32	Load the contents of the accumulator in the address location 2510H, M[2510] = A
	000A			10	
	000B			25	
6.	000C		MVI A, 00H	3E	A = 00H
	000D			00	
7.	000E		ADC A	8F	Add the carry generated
	000F		STA 2511	32	Load the contents of the accumulator in the address location 2511H, M[2511] = A
	0010			11	
8.	0011			25	
9.	0012		LXI H, 2501	21	Contents of memory location 2501H into HL register pair
	0013			01	
	0014			25	
10.	0015		MOV D, M	56	D = M[HL]
11.	0016		ADD D	82	A = A + D
12.	0017		LXI H, 2503H	21	Contents of memory location 2503H into HL register pair
	0018			03	
	0019			25	
13.	001A		MOV D, M	56	D = M[HL]
14.	001B		ADD D	82	A = A + D
15.	001C		STA 2511H	32	Load the contents of the accumulator in the address location 2511H, M[2511] = A
	001D			11	

	001E			25	
16.	001F		MVI A, 00H	3E	A = 00H
	0020			00	
17.	0021		ADC A	8F	Add the carry to the acumulator
18.	0022		STA 2512	32	Load the contents of the accumulator in the address location 2512H, M[2512] = A
	0023			12	
	0024			25	
19.	0025		HLT	76	Stop the program

Results generated from sim8085 designed by Jubin Mitra

M[2500] = ABH, M[2501] = CDH, M[2502] = ABH, M[2503] = CDH, therefore the addition result is (CDAB + CDAB = 019B56) M[2510] = 56, M[2511] = 9B, M[2512] = 01



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