

LAB 1

AIM: Familiarisation with the MAT385 (8085 microprocessor - 8 bit)

The communication between the microprocessor and you is controlled by a "monitor-program" which is provided on the MAT385 permanently in a ROM (locations 0000-07FF) and is started by the "reset" key.
The monitor understands certain commands embodied in the KEYS on the 'key-pad' of the MAT385 such as:

KEY	ACTION PERFORMED
RESET	Pressing this key allows the monitor program to start-off from the same address and the monitor displays '80 85'. The monitor is now ready to accept your commands. When starting off always press this key.
SUBST MEM	Allows you to examine and/or change the values in memory locations. The monitor responds by displaying a decimal point. It is then ready to accept the 4-digit hex address.
NEXT EXAM REG	To move to the next subsequent location. Allows you to examine and/or change values in CPU registers (A-F), stack pointer and program counter.
GO	After entering the program it is desired to run it the 'GO' command does this. After pressing this key the monitor expects a 4-digit hex address from where the program should start running.
SINGLE STEP	Once a program has been entered using the 'subst-mem' command, it is run using the 'go' command. If errors occur then the single-step command is used to facilitate debugging. This runs one program line at a time and thus the processor status in registers and memory locations may be examined after each instruction.
EXEC	Executes the previous command. Hence it is used after all the above commands.

****Please look at the front panel of the MAT385 for a schematic description of how to use the commands stated above.

EXPT 1: 2800-2804
Fill in memory locations 8090-8004 with hexa-decimal values 60, A3, 5C, Bf, 2E. Check to see if the locations actually contain the values you have input. Use 'subst-mem' key.

Try loading the same data in locations 0000-0004. What happens? Explain.

A1B C
F J
S S
A

EXPT 2: Fill the program-counter (PC) with 2010, the stack-pointer (SP) with 20C2 and the C-register with 6B. Then check the result i.e. if the reg's actually contain the values you input. Use exam-reg key.

EXPT 3: Now enter the following program.

ADDRESS	DATA	MNEMONIC	COMMENTS
2000	31	LXI SP 20C2	: INITIALISE STACK
2001	C2		POINTER
2002	20		: (B) <-- 13 ✓
2003	06	MVI B, 13	
2004	13		: (A) <-- 40 ✓
2005	3E	MVI A, 40	
2006	40		: (A) <-- (A) + (B)
2007	80	ADD B	: (B) <-- (A)
2008	47	MOV B, A	: RETURN CONTROL
2009	CF	RST 1	TO MONITOR

Run this program.

Check the contents of register B. You may single step through the program to see if the program is doing what you expect it to do.
Input different values in locations 2004 and 2006. Run this program and see if the result you expect is found in register B.
Eg. Is 36+15=51? If not, why not?

**** READ ASSIGNMENT 0-1 OF MAT385 MANUAL VOL 1. IF TIME ALLOWS.

***** THIS IS AN IMPORTANT LAB. GET TO KNOW HOW TO USE THE KEYS. FUTURE LABS WILL BUILD ON THIS.

SP

to check contents 86
Enter hex → exec → 90 → 8000 → EXEC → Exam key → B