Digital Electronics & Microprocessors Laboratory (EC2P006)

EXPERIMENT-10

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Objective:

- Interfacing of a 7-Segment Display with 8255 Peripheral Interface of 8085 Microprocessor and write a program to display the word the word "IIT BBS" on the 7-Segment Display.

Interfacing Strategy:

- The connection of the 8085-Microprocessor with the 7-Segment Display is done through the 8255 Peripheral Interface.
- The 7-Segment Display has a connector board with 26 pins to connect with the 8085 hardware.
- The Commands are to be entered manually, at the memory locations. We enter the memory location and the corresponding opcode for the instructions.
- Once the program feeding is done, the program is executed and the output is verified.
- Each letter has a specific code for the 7-Segment Display, which can be found by realizing which segments are supposed to glow and which are not, while displaying the Letter/Digit.

Components Used:

- 8085 Microprocessor Kit.
- 7-Segment Display Kit.

Program:

Address	Opcode	Label	Mnemonics	Comment
8000	3E 80		MVI A,80H	Configure 8255 for mode 0
8002	D3 43		OUT 43H	All ports as output
8004	21 40 80	LOOP 4	LXI H,8040H	Start of delay code
8007	16 02		MVI D,02H	2 groups
8009	06 04	LOOP 3	MVI B, 04H	4 characters
800B	0E 08	LOOP 2	MVI C, 08H	8 segments
800D	7E		MOV A, M	Get display code
800E	23		INX H	Increase HL, Pointer Value
800F	07	LOOP 1	RLC	Rotate left accumulator
8010	5F		MOV E, A	Get 1 data bit
8011	5F		OUT 41H	Output it
8013	D3 41		MVI A, 01H	Output clock 1
8015	3E 01		OUT 42 H	Shift register
8017	D3 42		DCR A	Output clock 0
8018	3D		OUT 42H	Shift register
801A	D3 12		MOV A, E	Move E -> A
801B	7B		DCR C	
801C	0D		JNZ LOOP1	Not zero LOOP1 continues
801F	C2 0F 80		DCR B	Decrease B
8020	05		JNZ LOOP2	Not 0, LOOP2 continues
8023	CD 30 80		CALL DELAY	Call Delay Subroutine
8026	CD 30 80		CALL DELAY	Call Delay Subroutine
8029	15		DCR D	All groups over

802A	C2 09 80		JNZ LOOP3	Not zero, LOOP3 continues
802D	C3 04 80		JMP LOOP4	Start from beginning
8030	01 FF FF	DELAY	LXI B, FFFFH	Delay Subroutine
8033	0B	NEW	DCX B	
8034	78		MOV A, B	
8035	B1		ORA C	
8036	C2 33 80		JNZ NEW	
8039	C9		RET	

Conclusion

The experiment was successfully conducted and we learned the interfacing of the 7-Segment Display with the 8085 Microprocessor. Here we displayed the word “IIT BBS”. The program was written and it was fed to the Microprocessor by entering the opcodes at the specific Memory Addresses. Also, we learned about the specific code given to each digit/letter and how they can be found by taking into account the glowing and non-glowing segments.