

ASSIGNMENT- 03

OBJECTIVE: To study the code of MONITOR PROGRAMS written in the ROM of 8085 boards.

PROGRAM NO.: 1

PROGRAM: 02B7-UPDATE DISPLAY

ASSEMBLY LANGUAGE PROGRAM:

LABEL	MNEMONICS		REMARKS
	OPCODE	OPERAND	
START-02B7->	RRC		If the LSB of the accumulator is 0 then 4 address segments are Sent, data present in the memory locations pointed to by the HL HL pair otherwise 2 data segments are sent, data. The 7 segment corresponding to the data are selected using the contents of ROM at 0384 onwards. This selected value is sent out at port C1.
	JC	02C2	
	MVI	C 04	
	MVI	A 90	
	JMP	02C6	
02C2->	MVI	C 02	
	MVI	A 94	
02C6->	OUT	C1	
	NOP		
02C9->	MOV	A M	
	XCHG		Register B is set 01 if dot is to be seen otherwise dot is not seen. Since the segment displays are common anode type so CMA instruction is written at 02DC
	LXI	H 0384	
	ADD	L	
	MOV	L A	
	MOV	A M	
	MOV	H C	
	DCR	H	
	JNZ	02DC	
	DCR	B	
	JNZ	02DC	
	ORI	08	
02DC->	CMA		
	OUT	C0	
	NOP		
	XCHG		
	INX	H	
	DCR	C	
	JNZ	02C9	
STOP	RET		

THE CONTENTS OF MEMORY LOCATIONS 0384 ONWARDS:

0384 -> F3 - corresponding to 0 (11110011)
60 - corresponding to 1 (01100000)
B5 and so on .
F4
66
D6
D7
70
F7
F6
77
C7
93
E5
97
17
67
83
37
60
00
00
00
00
00
00
00

THE CONTENTS OF MEMORY LOCATIONS 026C WHICH LOADS THE MEMORY LOCATION 20F9 AND ONWARDS WITH THE CONTENTS OF DE REGISTER PAIR:

LABEL	MNEM	ONICS	REMARKS
	OPCODE	OPERAND	
START-026C->	MOV	A D	The MSB of reg D is stored in the Memory location 20F9.Its LSB is Stored in 20FA.Similarly the MSB n LSB of register E are Stored in the locations 20FB and 20FC respectively.HL pair is Loaded with 20F9.
	RRC		
	RRC		
	RRC		
	RRC		
	ANI	0F	
	LXI	H 20F9	
	MOV	M A	
	MOV	A D	
	ANI	0F	
	INX	H	
	MOV	M A	
	MOV	A E	
	RRC		
	RRC		
	RRC		
	RRC		
	ANI	0F	
	INX	H	
	MOV	M A	
	MOV	A E	
	ANI	0F	
	INX	H	
	MOV	M A	
	LXI	H 20F9	
STOP	RET		

PROGRAM NO.: 2

PROGRAM: 0363-UPDATE ADDRESS FIELD

ASSEMBLY LANGUAGE PROGRAM:

LABEL	MNEM	ONICS	REMARKS
	OPCODE	OPERAND	
START-0363->	CALL	026C	It places <DE>pair in memory locations 20F9 onwards , clears accumulator and calls 02B7 routine.
	XRA	A	
	CALL	02B7	
STOP	RET		

PROGRAM NO.: 3

PROGRAM: 036E-UPDATE DATA FIELD

ASSEMBLY LANGUAGE PROGRAM:

LABEL	MNEM	ONICS	REMARKS
	OPCODE	OPERAND	
START-036E->	MOV	D A	It places <A>in reg D and calls 026C routine. Then loads accumulator with 01 and calls 02B7 routine.
	CALL	026C	
	MVI	A 01	
	CALL	02B7	
STOP	RET		

PROGRAM NO.: 4

PROGRAM: 05F1-DELAY ROUTINE

ASSEMBLY LANGUAGE PROGRAM:

LABEL	MNEM	ONICS	REMARKS
	OPCODE	OPERAND	
START-05F1-> STOP	DCX	D	It produces delay equal to the <DE>* no. of T_states in one iteration* time period of clock. (approximately)
	MOV	A D	
	ORA	E	
	JNZ	05F1	
	RET		

PROGRAM NO.: 5

PROGRAM: 01D7-BLANK ALL THE DISPLAY SEGMENTS

ASSEMBLY LANGUAGE PROGRAM:

LABEL	MNEM	ONICS	REMARKS
	OPCODE	OPERAND	
START-01D7-> STOP	XRA	A	It clears accumulator, loads <HL>with 039A which contains 00 so that no segment is selected and 4 contiguous locations from 039A also contain 00.It then calls 02B7 routine The accumulator is loaded with 01 and reg B is loaded with 00 and 02B7is called.
	LXI	H 039A	
	CALL	02B7	
	MVI	A 01	
	MVI	B 00	
	LXI	H 039A	
	CALL	02B7	
	RET		

PROGRAM NO.: 6**PROGRAM:** 02E7-READ KEYBOARD.**ASSEMBLY LANGUAGE PROGRAM:**

LABEL	MNEM	ONICS	REMARKS
	OPCODE	OPERAND	
START-02E7->	LXI	H 20FE	<HL> & accumulator are loaded with the contents of 20FE. The contents of accumulator are checked, if equal to 80 then 20FE is again loaded with 80,i.e. no valid key is pressed the processor is put in DI mode, else the accumulator contains the code of key pressed, the RST 5.5 interrupt is again enabled. The ISR waits for the next key pressed.
02F3->	MOV	A M	
	ORA	A	
	JP	02F3	
	EI		
	JMP	02E7	
002C-> 028E->	MVI	M 80	
	DI		
	RET		
	JMP	028E	
	PUSH	H	
STOP	PUSH	PSW	The routine reads the FIFO RAM & stores the Key Code in 20FE location. By default 20FE is made to contain 80 (not a valid key code). The contents of PSW & H-L are pushed into stack. The Read FIFO RAM command word is placed in location C100. The contents of location C000 are placed in accumulator. the value is anded with 3F to mask off the CONTROL & SHIFT keys. The contents of A are stored in location 20FE. PSW & H-L are popped.
	LXI	H C100	
	MVI	M 40	
	DCR	H	
	MOV	A M	
	ANI	3F	
	STA	20FE	
	POP	PSW	
	POP	H	
	RET		
