8085 Project Report

LOCK SYSTEM

A report submitted in part fulfilment Microprocessor Lab Course

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Chapter 1: Introduction

Lock System is responsible for providing security to the devices or goods in terms of lock and unlocks to prevent unwanted access from the people. Considering the data as the new oil, any access to data to an unrecognised person can cause a huge loss to a person. Different types of security measures are available and are selected depending upon the requirements and lock system is one of them. User can set a password of their choice for the opening of the device and If the user entered password matches with the set password, then device gets unlock and if doesn't matches then the device will not open thus it prevents the unwanted access.

This is made with the help of Intel 8085 Microprocessor. It makes the use of 8255 programmable peripheral interface IC for I/O interfacing along with switches and the 7-segment display. Using switches, user can set a password of their choice otherwise a default password is set to lock the system. If input data matches with the correct password, the device will get open and 1 will be displayed on the 7-segment display as successful try otherwise 0 will be displayed as the wrong try.

Chapter 2: Schematic

Figure 1: Schematic for Lock System
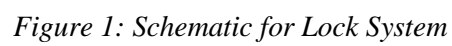
Chapter 3: Working Procedure

Overview: Port A and port C are connected with switches representing the numbers from 00H-0FFH to lock and unlock the device.
Port B is connected with a 7-segment display to know the status of the microprocessor.

Step 1: Control Word of 8255 is set as 99H so that IC acts in I/O mode, Group A and Group B in Mode 0, Port A and Port C as input ports and Port B as the output port.

Step 2: User will be asked to set a password of his choice. Port C is used as input to know if the user wants to set a password or not.

Step 3: If the user doesn't want to set the password he is required to set 00H at port C then 0FFH will be set as a password by default to lock the system.
If any number between 01H-0FFH is given at port C it means the user wants to set the password.

Step 4: If the user wants to set password he will be given 10sec delay and in this time 2 will be displayed on 7-segment. 2 represents that user needs to set a password of his choice. For this port A is used to take a password from the user. As soon as the password is set and 10sec completes 3 will be displayed on 7-segment. 3 represent that new password is set and now user can unlock the device.

If the user presses 00H then 3 will be displayed on 7-segment. 3 represents that the user can unlock the device. Again Port A is used as an input port to receive password trials to unlock the device.
Note:
1. Register B is used to store the correct password.
2. Port C is used as input to know if the user wants to set a password or not
3. Port A:
4. To take a password from the user if he wants to set a new password
5. To unlock the device.

Step 5: As soon as 3 is displayed on the 7- segment display 10sec delay is called so that user can try to unlock the system by manipulating the switches acting as input at port A of 8255.

Step 6: Now, this entered password will be compared with the correct password stored into Register B.

Step 7: If both password matches '1' will be displayed on 7-segment messaging a successful try and after 10sec device gets automatically lock and user needs to perform same steps from step 2 to unlock the device.
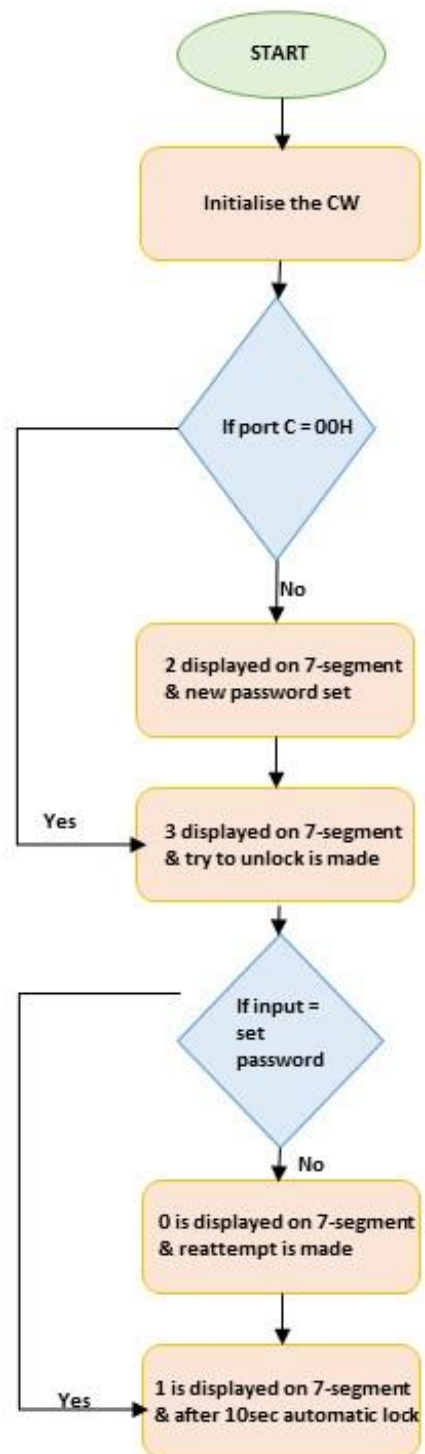And if doesn't matches then '0' will be displayed on 7-segment messaging a wrong try and after 10sce delay user need to perform the same steps from step 5 to unlock the device.

Chapter 4: Assembly Code

Label	Opcode	Comments
	MVI C,00H	TO COMPARE WITH REGISTER C
	MVI A,99H	TO SET THE CW
	OUT 83H	CW<-83H
START	MVI B, 0FFH	FFH IS SET AS DEFAULT PASSWORD
	IN 82H	USER CAN PRESS ANY NUMBER FROM 01H-FFH TO SET PASSWORD
	CMP C	IF PORT C=00H THEN DONT UPDATE OTHERWISE SET NEW PASSWORD
	JNZ CHECK	JUMP TO CHECK
	MVI A,5BH	TO SET 2 INTO 7-SEGEMENT DISPLAY
	OUT 81H	2 WILL BE DISPLAYED UNTILL NEW PASSWORD IS SET
	CALL DELAY1	10Sec DELAY TO SET NEW PASSWORD
	IN 80H	PORT A GET NEW PASSWORD
	MOV B, A	B WILL STORE THE NEW PASSWORD
CHECK	MVI A,4FH	TO SET 3 INTO 7-SEGEMENT DISPLAY
	OUT 81H	3 IS SET INFORMING USER TO INSERT TRIAL PASSWORD TO UNLOCK
	CALL DELAY1	10SEC DELAY SO THAT USER CAN ENTER DATA TO UNLOCK DEVICE
	IN 80H	TRIAL PASSWORD INSERTED THROUGH PORT A
	CMP B	COMPARING IT WITH SET PASSWORD
	JNZ SUCCESS	IF TRAIL PASSWORD MATCHES THEN JUMP TO SUCCESS OTHERWISE DISPLAY 0
	MVI A,3FH	SETTING ACC AS 0 TO SHOW TRIAL PASSWORD DOESN'T MATCH
	OUT 81H	0 TRANSFERRED TO PORT B
	CALL DELAY1	10Sec DELAY IS CALLED

Label	Opcode	Comments
	JMP CHECK	USER IS REQUIRED TO PERFORM THE SAME PROCESS AGAIN
SUCCESS	MVI A,06H	1 TRANSFERRED TO A TO SHOW TRIAL PASSWORD MATCHES
	OUT 81H	1 TRANSFERRED TO PORT B TO DISPLAY INTO 7-SEGEMENT
	CALL DELAY1	10 SEC DELAY THEN AUTOMATICALLY GETS LOCKED AGAIN
	JMP START	USER NEED TO REPEAT THE SAME PROCESS AGAIN
	MVI B, 64H	SUBROUTINE FOR 10 SEC DELAY
LOOP3	MVI C,0FFH	
LOOP2	MVI D, 0FFH	
LOOP1	DCR D	
	JNZ LOOP1	
	DCR C	
	JNZ LOOP2	
	DCR B	
	JNZ LOOP3	
	RET	

Chapter 5: Flow Diagram

Chapter 6: Result

When a successful try is made that is if entered password matches with the set password then 1 will be displayed on the 7-Segment display.

When the entered password doesn't match with the set password then 0 will be displayed on the 7-Segment display.

Chapter 7: Future Goals

Following changes can be made:

1. Switches at port A and port B can be replaced with keypad to make it more attractive.
2. 8254 IC can be used for the delay so that microprocessor resources can be utilized in more efficient way.
3. Buzzer can be used to alert if any unrecognised try is made to unlock the system.
4. Actuators can be used to perform some action depending upon the situation to catch the thief when wrong try is made. Example: closing the doors so that thief cannot escape.
5. If connected with Wi-Fi it can send notification to nearby police station if any wrong attempt is made. This can be used for home security when family members are not available at home.