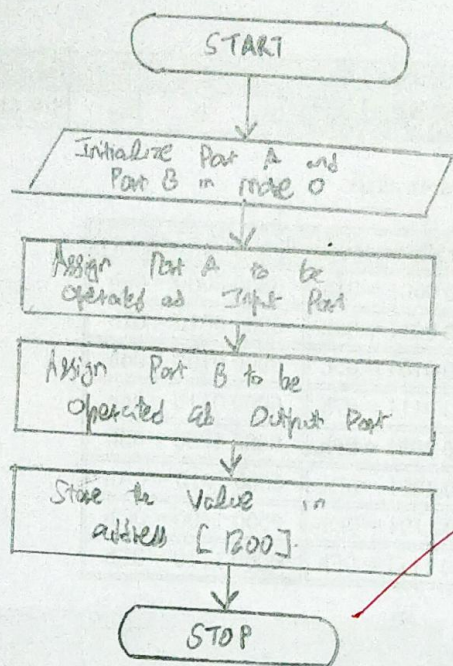
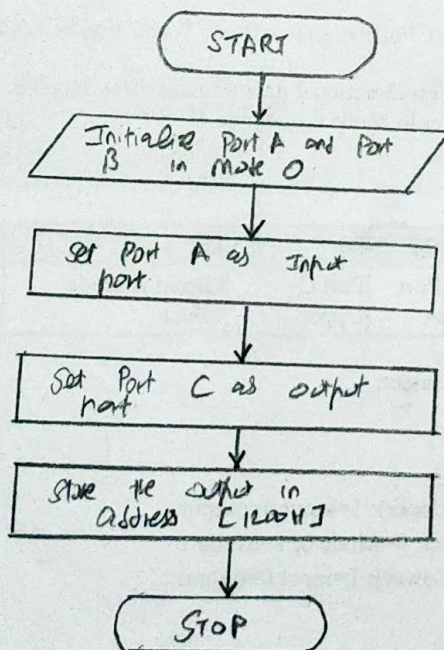


MODE 0, PORT A INPUT, PORT B OUTPUT PORT



MODE 0, PORT A INPUT PORT, PORT C OUTPUT PORT.



Port Address

Register	Address
Control word register	C6
Port A	C0
Port B	C2
Port C	C4

6.4 In-Lab Assignment

1. Initialize Port A as input port and Port B as output port in Mode 0, to input the data at Port A as set by the SPDT switches and to output the same data to Port B to glow the LED accordingly.
2. Initialize Port A as input port and Port C as output port in Mode 0, to input the data at Port A as set by the SPDT switches and to output the same data to Port B to glow the LED accordingly.
3. Initialize Port C as input port and Port B as output port in Mode 0, to input the data at Port A as set by the SPDT switches and to output the same data to Port B to glow the LED accordingly.

6.5 Program

Mode 0, Port A input port, Port B output port

ADDRESS	LABEL	MNEMONICS	OPCODE	COMMENTS
1000		MOV AL,90H	C6C090	Transfer of Control word 90H to AL register.
1003		OUT C6,AL	E6C6	Transfer of AL to Control word register.
1005		IN AL,C0	E4C0	Take input from Port A.
1007		OUT C2,AL	E6C2	To Store value of AL in Port B.
1009		MOV [1200],AL	88060012	Store value from AL to address 1200H.
100D		HLT	F4	Terminate the program.

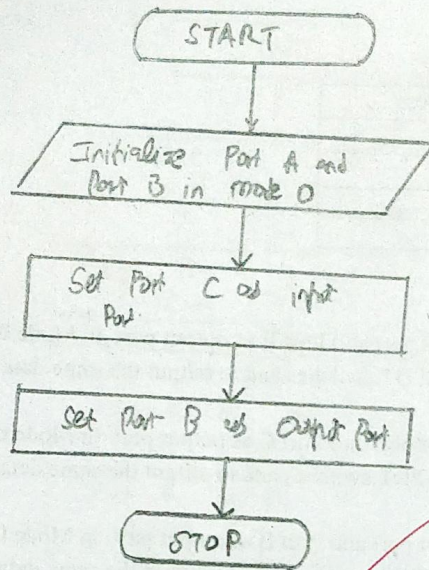
Mode 0, Port A as input port and Port C as output port

ADDRESS	LABEL	MNEMONICS	OPCODE	COMMENTS
1000		MOV AL,90H	C6C090	Transfer of data 90H to AL register.
1003		OUT C6,AL	E6C6	Transfer of data from AL to control word register.
1005		IN AL,C0	E4C0	Take input from Port A.
1007		OUT C4,AL	E6C4	Take transfer from AL to Port C.
1009		MOV [1200],AL	88060012	Data transfer from AL to address 1200H.
100D		HLT	F4	Terminate the Program.

Mode 0, Port C input port, Port B output port

ADDRESS	LABEL	MNEMONICS	OPCODE	COMMENTS
1000		MOV AL,89H	C6C089	Transfer the Control word 89H to AL.
1003		OUT C6,AL	E6C6	Transfer of data from AL to control word register.
1005		IN AL,C4	E4C4	Take input from Port C.

MODE 0, PORT C INPUT PORT, PORT B OUTPUT PORT



1007		OUT C2,AL	E6C2	Transfer the data to Port C
1009		MOV [1200],AL	32 060012	Store the value to address 1200
100D		HLT	F4	Terminate the Program

6.5 Pre-lab Questions

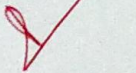
1. How 8255 is programmed?
2. What is the use of mode 2 in 8255A PPI?
3. What is an interrupt I/O?
4. Why a latch is used for the output port and a tri-state buffer is used for the input port?

6.6 Post-lab Questions

1. A control word is given CW=CDH. Explain the conditions of ports of 8255.
2. What is the need for Port?
3. The 8255 Programmable Peripheral Interface is used as described below.
 - (i) An A/D converter is interface to a microprocessor through an 8255. The conversion is initiated by a signal from the 8255 on Port C. A signal on Port C causes data to be strobed into Port A.
 - (ii) Two computers exchange data using a pair of 8255s. Port A works as a bidirectional data port supported by appropriate handshaking signals.
 What would be an appropriate mode of operation for (i) and (ii) conditions?. Give explanation.

6.7 Result

An AT89C51 to read inputs from the 3- switches and send the same data to LEDs by interfacing 8255 and 8086 was performed and verified.



Microprocessor Lab

Experiment 6 - Programmable Peripheral Interface (PPI).

I Pre-lab Questions:

1. How is 8255 programmed?

Soln. The 8255 chip is programmed in any of the 4 modes (mode 0, mode 1, mode 2, and BSR) by sending Control word to the Control register of 8255. We must first give the port address assigned to each of ports A, B, C and the Control register. This is called mapping the I/O port.

2. What is the use of mode 2 in 8255 A PPI?

Soln. Mode 2 - is a Bidirectional I/O mode. In this mode only Port A will work. Port B can either be in mode 0 or mode 1 and port C bits are used as hand shake signal. It also has interrupt handling capacity.

3. What is an interrupt I/O?

Soln. Interrupt I/O is a way of controlling I/O activity in which a peripheral (or) terminal that needs to make/receive a data transfer sends a signal that causes a program interrupt to be set.

4. Why a latch is used for the output port and a tri-state buffer for the input port?

Soln. A tri-state buffer is used when you need the ability to have the same port serve such data as both an I/O and O/H port. And a latch is used for O/H port to drive the appropriate logic levels.

II Post-Lab Questions:

1. A control word is given CW- CDH. Explain the conditions of ports 8255.

Soln.

$$CD = 1100 \quad 1101$$

D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
1	1	0	0	1	1	0	1

$$D_7 - \text{If mode} = 1$$

$$D_6 = 1 + D_5 = 0 - \text{Port A is in mode 2.}$$

$$D_4 = 0 - \text{Port A is o/p port}$$

$$D_3 = 1 \rightarrow \text{Port C (upper) is i/p port}$$

$$D_2 = 1 - \text{Port B is in mode 1}$$

$$D_1 = 0 - \text{Port B is o/p}$$

$$D_0 = 0 - \text{Port C (lower) is i/p port}$$

2. What is the need for port

Soln. Port acts like a channel and provides a method to transfer signals between the component devices. So, in 8255, there are 3 ports which transfer the data from 8255 to 8086 and vice versa.

3.

Soln (i) Since, Port C takes data to be stored into Port A, the appropriate mode of operation is mode 1.

Soln (ii) Since port A acts as bidirectional port, it happens to be in the mode 2 operation.