Shri Vile Parle Kelvani Mandal's

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

Approved by AICTE and Affiliated to the University of Mumbai

Department of Electronics & Telecommunication Engineering

Mini Project Report
On
MultiplicationOf Two Numbers And Display On Two, 7 Segment Common Cathode Led

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CERTIFICATE

This is to certify that Ms/Mr _____

SAP ID of TE EXTC 1:_____ has submitted MPP Mini Project for the Academic Year 2018-2019.

Guide Examiner

Head of Department

EXTC Department

Index

Aim:

Interface 7 segment display to 8086 microprocessor using 8255 PPI and write a program to display multiplication of two numbers on 7 segment.

Theory:

The 8255 is a general purpose programmable I/O device designed to transfer the data from I/O to interrupt I/O under certain conditions as required. It can be used with almost any microprocessor.
It consists of three 8-bit bidirectional I/O ports (24I/O lines) which can be configured as per the requirement.

Ports of 8255A

8255A has three ports, i.e., PORT A, PORT B, and PORT C.
Port A contains one 8-bit output latch/buffer and one 8-bit input buffer.
Port B is similar to PORT A.
Port C can be split into two parts, i.e. PORT C lower (PC0-PC3) and PORT C upper (PC7-PC4) by the control word.
These three ports are further divided into two groups, i.e. Group A includes PORT A and upper PORT C. Group B includes PORT B and lower PORT C. These two groups can be programmed in three different modes, i.e. the first mode is named as mode 0, the second mode is named as Mode 1 and the third mode is named as Mode 2.

Operating Modes

8255A has three different operating modes −
Mode 0 − In this mode, Port A and B is used as two 8-bit ports and Port C as two 4-bit ports. Each port can be programmed in either input mode or output mode where outputs are latched and inputs are not latched. Ports do not have interrupt capability.
Mode 1 − In this mode, Port A and B is used as 8-bit I/O ports. They can be configured as either input or output ports. Each port uses three lines from port C as handshake signals. Inputs and outputs are latched.

Mode 2 − In this mode, Port A can be configured as the bidirectional port and Port B either in Mode 0 or Mode 1. Port A uses five signals from Port C as handshake signals for data transfer. The remaining three signals from Port C can be used either as simple I/O or as handshake for port B.

Features of 8255A

The prominent features of 8255A are as follows −

It consists of 3 8-bit IO ports i.e. PA, PB, and PC.

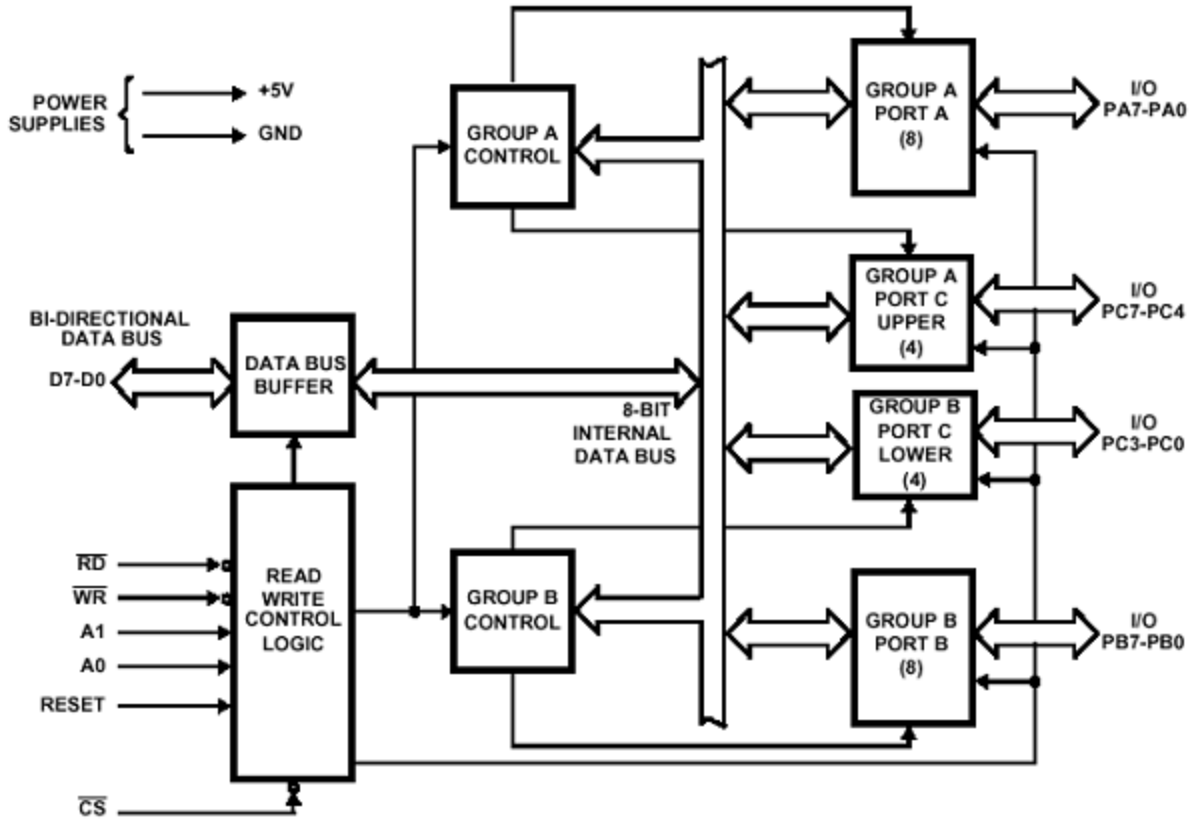
Address/data bus must be externally demux'd.

It is TTL compatible.

It has improved DC driving capability.

8255 Architecture

The following figure shows the architecture of 8255A −



Software used:

Tasm/debug

Hardware used:

8086 trainer kit, two 7 segment display, FRC cables, SMPS and connecting wires.

Algorithm:

1) Initialize the 8255 PPI;configure port A as a output port in mode 0.

2) Initialize memory pointer with starting address offset of lookup table of seven segment code.

3) Insert the code for multiplication of two numbers in the kit.

4) Insert two numbers to be multiplied in the memory.

5) Get the seven segment code from the lookup table pointed by memory pointer

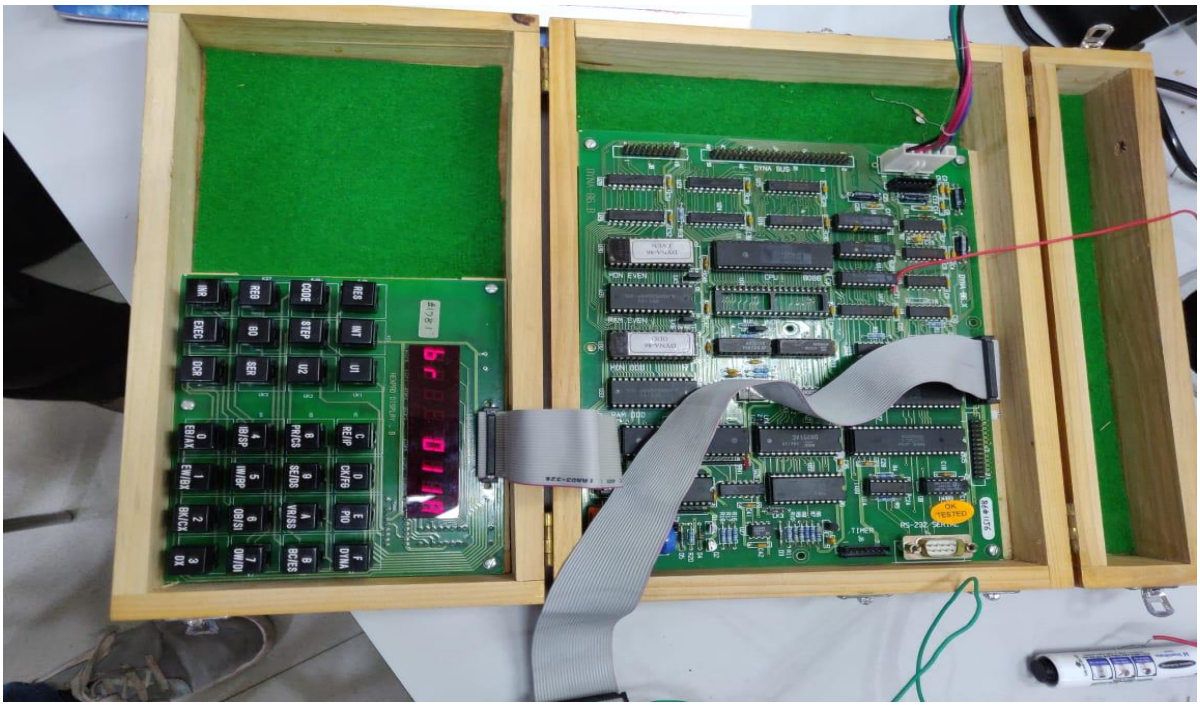
6)Send to port A to display the digit.

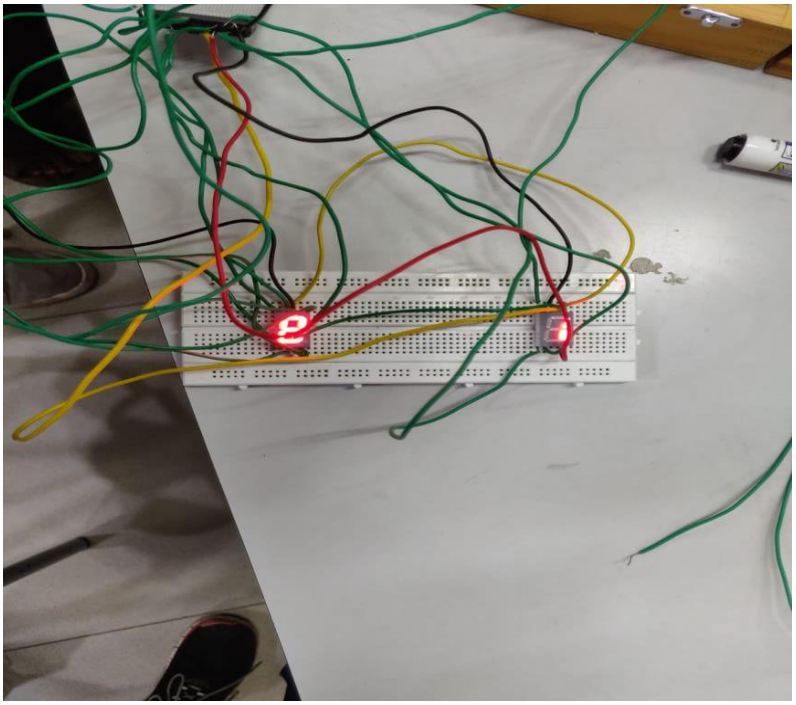
7) Execute the code.

Code:

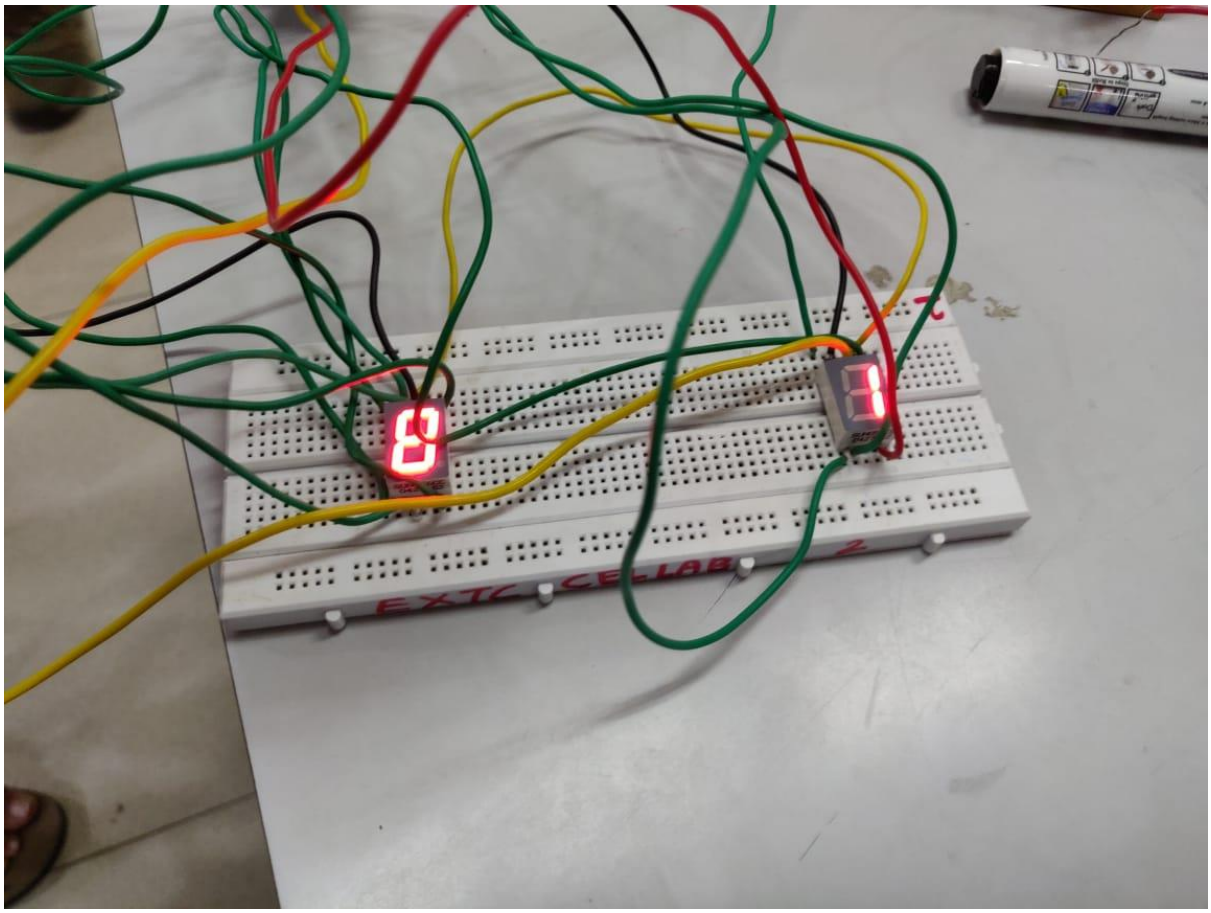
Address	OPcode	Mnemonics	Data
2000:0100	B080	MOV	AL,80
2000:0102	E666	OUT	66,AL
2000:0104	BB0002	MOV	BX,0200
2000:0107	A00003	MOV	AL,[0300]
2000:010A	8A2E0103	MOV	AL,[0301]
2000:010E	F6E5	MUL	CH
2000:0110	D40A	AAM	0A
2000:0112	D7	XLATB	
2000:0113	E662	OUT	62,AL
2000:0115	88E0	MOV	AL,AH
2000:0117	D7	XLATB	
2000:0118	E660	OUT	60,AL
2000:011A	CC	INT	3
2000:011B	0000	ADD	[BX+SI],AL
2000:011D	0000	ADD	[BX+SI],AL
2000:011F	0000	ADD	[BX+SI],AL

Circuit Diagram:





Output:



Conclusion:

We have successfully programmed a code for MULTIPLICATION of two numbers and displayed the output using 7 segment LED.