

17.write an assembly language program(ALP) to search element from given list of elements

| ADDRESS | LABEL | OPCODE | OPERANDS |
|---------|-------|--------|----------|
| 2000 | | MOV | DX,0000 |
| 2001 | | | |
| 2002 | | | |
| 2003 | | MOV | SI,2100 |
| 2004 | | | |
| 2005 | | | |
| 2006 | | MOV | CX,0003 |
| 2007 | | | |
| 2008 | | | |
| 2009 | | MOV | AL,[SI] |
| 200A | | | |
| 200B | L3 | INC | SI |
| 200C | | MOV | BL,[SI] |
| 200D | | | |
| 200E | | CMP | AL,BL |
| 200F | | | |

| | | | |
|------|----|-----|----------|
| 2010 | | JNE | L1 |
| 2011 | | | |
| 2012 | | MOV | DX,0FFFF |
| 2013 | | | |
| 2014 | | | |
| 2015 | | JMP | L2 |
| 2016 | | | |
| 2017 | L1 | DEC | CX |
| 2018 | | JNZ | L3 |
| 2019 | | | |
| 201A | L2 | INT | 03 |

INPUT:
2100-02
2101-03
2102-04

OUTPUT:04 AT 2102

18.Code conversion from hexadecimal to decimal

```
DATA SEGMENT
HEX DB 0AFH
BCD DW 0
CNT DB 0
DATA ENDS
CODE SEGMENT
ASSUME CS:CODE,DS:DATA
START:
MOV AX,DATA
MOV DS,AX
MOV AL,HEX
CMP AL,00
JZ LAST

LOOP1:
MOV AH,00
MOV BL,0AH
DIV BL
MOV DH,00
MOV DL,AH
MOV BL,AL
MOV AL,04
MUL CNT
MOV CL,AL
ROL DX,CL
OR BCD,DX
MOV AL,BL
INC CNT
CMP AL,0
JNZ LOOP1
LAST:INT 3
CODE ENDS
END START
END
```

19.Sum of set of BCD numbers

DATA SEGMENT

NUM1 **DB** 05

NUM2 **DB** 06

RESULT **DB** ?

ENDS

CODE SEGMENT

ASSUME DS:DATA CS:CODE

START:

MOV AX,DATA

MOV DS,AX

MOV AL,NUM1

ADD AL,NUM2

MOV RESULT,AL

MOV AH,0

AAA

MOV AH,4CH

INT 21H

ENDS

END START

CYCLE-II

20. Write An Alp To Demonstrate Stepper Motor Interface

; Assume the interface is connected over J4 of the trainer.
; This program illustrates the control of direction of
; rotation of the Stepper motor depending upon user choice.
; The program executes in a continuous loop.
; The program can be executed in STAND-ALONE MODE or SERIAL
; MODE of operation.
; The program starts at memory location 0:2000H
; Please refer ESA 86/88E user's manual for mnemonic
; syntax suitable to trainer

```
                OUTPUT 2200AD
                ORG 2000H
                MOV AX,0000H      ;Initialise Segment
                MOV AL,80H
                MOV DX,0FFE6H     ;Initialise
                OUT DX,AL
                MOV AL,88H        ;Output value
                MOV DX,0FFE0H
LOOP:           OUT DX,AL
                CALL DELAY

                RCR AL,1
                JMP SHORT LOOP
DELAY:         MOV CX,1200H      ;Delay routine
SS:           LOOP SS
                RET
                END
```

21. Write An ALP To Demonstrate Traffic Light Controller Interface

; The interface is connected over J4 of of trainer
; Traffic system moves from one state to other after a fixed delay
; This program starts at 2000H location

OUTPUT 2200AD

```

                ORG 2000H
START:          MOV AL,80H           ; Initialization of 8255 Mode 0
                MOV DX,0FFE6H
                OUT DX,AL           ; All ports as o/p ports
AGAIN:          MOV SI,2038H        ; Table of port values
NEXTST:         MOV AL,[SI]
                MOV DX,0FFE0H
                OUT DX,AL           ; PortA value
                INC SI
                ADD DX,2
                MOV AL,[SI]
                OUT DX,AL           ; PortB value
                INC SI
                ADD DX,2
                MOV AL,[SI]
                OUT DX,AL           ; PortC value
                INC SI
                CALL DELAY           ; Calling Delay routine
                CMP SI,2044H        ; Checking for the end of the data values
                JNZ NEXTST
                JMP AGAIN
DELAY:          MOV CX,0FFH         ; Delay routine
DLY5:           PUSH CX
                MOV CX,03FFH
DLY10:          NOP
                LOOP DLY10
                POP CX
                LOOP DLY5
                RET

                ORG 2038H
PORTVALUES:    DB 88H,83H,F2H
                DB 38H,88H,F4H
                DB 83H,88H,F8H
                DB 88H,38H,F1H
                DB 00H
```

22. Write An Alp To Demonstrate 7- Segment Display Interface

; Demonstration program for Seven segment Display interface for
; ESA 86/88-E Trainer. The program assumes that the interface is
; connected over FRC connector J4 of the trainer. This program
; module displays 'ELECTRO SYSTEMS' on the interface LEDs with
; specific delay.
; The program can be executed in Stand Alone MODE or Serial mode.
; Execute the program from memory location 0:2000H

Aim:

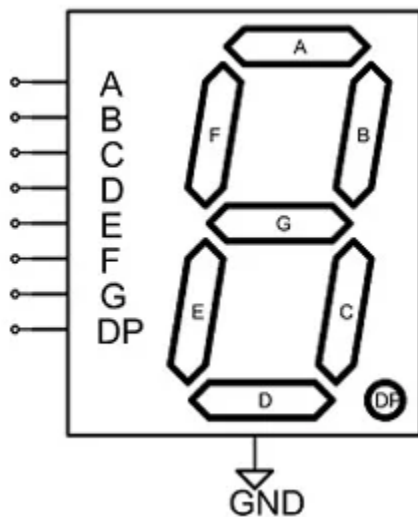
To display 8086 number in a four seven segment Common Anode LED display.

Hardware and Software Required:

8086 kit, LED Display Unit

Hardware Description:

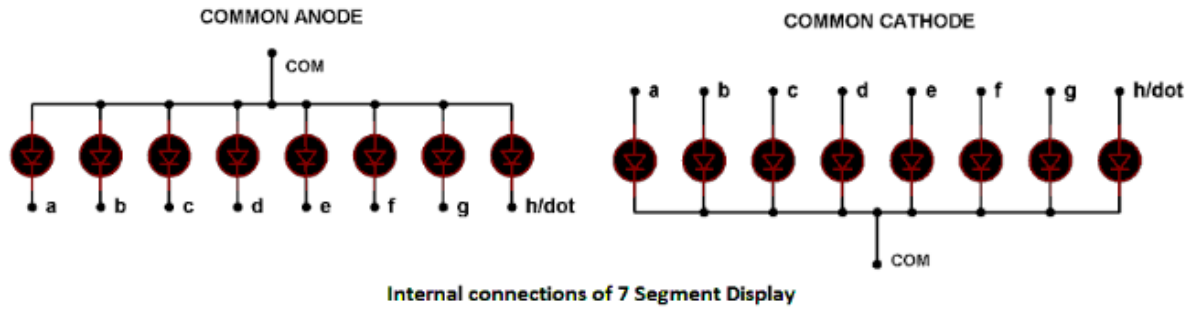
Seven segment displays are important display units in Electronics and widely used to display numbers from 0 to 9. It can also display some character alphabets like A,B,C,H,F,E etc



There are two types of 7 segment displays: Common Anode and Common Cathode:

Common Anode: In this all the Negative terminals (cathode) of all the 8 LEDs are connected together (see diagram below), named as COM. And all the positive terminals are left alone.

Common Cathode: In this all the positive terminals (Anodes) of all the 8 LEDs are connected together, named as COM. And all the negative terminals are left alone.



A table has been given below for all the numbers while using Common Anode 7 segment.

| Digit to Display | h g f e d c b a | Hex code |
|------------------|-----------------|----------|
| 0 | 11000000 | C0 |
| 1 | 11111001 | F9 |
| 2 | 10100100 | A4 |
| 3 | 10110000 | B0 |
| 4 | 10011001 | 99 |
| 5 | 10010010 | 92 |
| 6 | 10000010 | 82 |
| 7 | 11111000 | F8 |
| 8 | 10000000 | 80 |
| 9 | 10010000 | 90 |

Code:

```
OUTPUT 2500AD
ORG 2000H

MOV DX,FFE6H      ;Configure all 8255 ports
MOV AL,80H        ;as output.
OUT DX,AL

LOOP4: MOV SI,2100H ;Initialise pointer

LOOP3: MOV CH,04H  ;4 charecters/group
LOOP2: MOV BL,08H  ;8 segments/charecter

        MOV AL,[SI] ;get the display code
        INC SI      ;Increment pointer
LOOP1:  ROL AL,1    ;get 1 data bit
        MOV DX,FFE2H
        OUT DX,AL  ;o/p bit to portb
        MOV AH,AL
        MOV AL,01H ;o/p clock to
        MOV DX,FFE4H ;shift register
        OUT DX,AL
        DEC AL
        OUT DX,AL
        MOV AL,AH
        DEC BL      ;all bits over?
        JNZ LOOP1  ;no,continue
        DEC CH      ;all charecters over?
        JNZ LOOP2  ;no,continue
        CALL DELAY
        ;all groups over?
        JNZ LOOP3  ;no,continue
        JMP SHORT LOOP4

DELAY:  MOV CX,0FFFFH
XX:     DEC CX
        JNZ XX
        RET

;Display code table

ORG 2100H
STRING: DB 080H,0C0H,080H,080H

END
```

EXTRA PROGRAMS

All The Students Are Should Write Aim,App Req ,Algorithm & Flow Chart For Below Programs

23.WRITE AN ALP PROGRAM TO FIND THE FACTORIAL OF GIVEN NUMBER

| ADDRESS | LABEL | OPCODE | OPERANDS | COMMENTS |
|---------|-------|--------|------------|----------|
| 2000 | | MOV | SI,3000 | |
| 2001 | | | | |
| 2002 | | | | |
| 2003 | | MOV | AX,[SI] | |
| 2004 | | | | |
| 2005 | | MOV | BX,AX | |
| 2006 | | | | |
| 2007 | BACK | DEC | BX | |
| 2008 | | JZ | 200E(NXT) | |
| 2009 | | | | |
| 200A | | MUL | BX | |
| 200B | | | | |
| 200C | | JMP | 2007(BACK) | |
| 200D | | | | |
| 200E | NXT | INC | SI | |
| 200F | | MOV | [SI],AX | |
| 2010 | | | | |
| 2011 | | INT | 03 | |

INPUT:

3000-0004

OUTPUT:

3000-0024

24.WRITE AN ALP PROGRAM TO FIND THE LARGEST NUMBER FROM GIVEN 2 NUMBERS

| ADDRESS | LABEL | OPCODE | OPERANDS | COMMENTS |
|---------|-------|--------|------------|----------|
| 2000 | | MOV | SI,2100 | |
| 2001 | | | | |
| 2002 | | | | |
| 2003 | | MOV | CX,0004 | |
| 2004 | | | | |
| 2005 | | | | |
| 2006 | | MOV | AL,[SI] | |
| 2007 | | | | |
| 2008 | BACK | INC | SI | |
| 2009 | | MOV | BL,[SI] | |
| 200A | | | | |
| 200B | | CMP | AL,BL | |
| 200C | | | | |
| 200D | | JNC | 2011(NXT) | |
| 200E | | | | |
| 200F | | MOV | AL,BL | |
| 2010 | | | | |
| 2011 | NXT | DEC | CX | |
| 2012 | | JNZ | 2008(BACK) | |
| 2013 | | | | |
| 2014 | | INT | 03 | |

INPUT:

OUTPUT:2101-07(also in AL)

2100-05(AL)

2101-07(BL)

25.WRITE AN ALP PROGRAM TO FIND THE SMALLEST NUMBER FROM GIVEN 2 NUMBERS

| ADDRESS | LABEL | OPCODE | OPERANDS |
|---------|-------|--------|------------|
| 2000 | | MOV | SI,2100 |
| 2001 | | | |
| 2002 | | | |
| 2003 | | MOV | CX,0004 |
| 2004 | | | |
| 2005 | | | |
| 2006 | | MOV | AL,[SI] |
| 2007 | | | |
| 2008 | BACK | INC | SI |
| 2009 | | MOV | BL,[SI] |
| 200A | | | |
| 200B | | CMP | AL,BL |
| 200C | | | |
| 200D | | JC | 2011(NXT) |
| 200E | | | |
| 200F | | MOV | AL,BL |
| 2010 | | | |
| 2011 | NXT | DEC | CX |
| 2012 | | JNZ | 2008(BACK) |
| 2013 | | | |
| 2014 | | INT | 03 |

INPUT:

2100-05(AL)

2101-07(BL)

OUTPUT:2101-05(also in AL)