IMPERIAL COLLEGE of ENGINEERING

(Affiliated by Rajshahi University Code: 385)

Department of CSE

Report no - 2

Course Title: Computer Peripherals and Interfacing lab

Course Code: CSE4142

Submitted by,

Name: Teresa Jency Bala
ID: 1938520113
Part: 4, Semester: Odd

Question:

Use 8086 Interfacing Trainer in Kit mode to display letters E, F and H on a 7-Segment LED with a delay 5 seconds between each display. The output will be continued until the system is reset.

Date: 9-September-2023
Day: Saturday

Submitted to,

Shovon Mandal
Adjunct Lecturer, CSE

Title:

Using emu8086 and Emulation Kit for 8086 Microprocessor to Display Traffic Light in Sequence

Objective:

The objective of this lab experiment is to utilize the 8086 Interfacing Trainer in Kit mode to display the letters 'E', 'F', and 'H' on a 7-Segment LED with a 5-second delay between each display. The output should continue indefinitely until the system is reset.

Theory:

8086 Microprocessor: The 8086 microprocessor is a 16-bit processor developed by Intel, widely used in early computing systems.

7-Segment LED Display: A 7-Segment LED display is a common output device used to display numeric and alphabetic characters. It consists of seven individual LED segments that can be controlled to form characters.

8086 Interfacing Trainer: The 8086 Interfacing Trainer is a hardware kit designed to interface the 8086 microprocessor with various input and output devices.

Requirements:

- 8086 Interfacing Trainer in Kit mode.
- Provided 8086 assembly code.
- Emu8086

Procedure:

Initialization: Set up the 8086 Interfacing Trainer in Kit mode. Load the provided 8086 assembly code into the trainer.

Main Loop: The program enters a main loop (continue) to control the display of characters. Inside the loop, it sets the output ports to display the characters 'E', 'F', and 'H' sequentially on the 7-Segment LED display. A 5-second delay is introduced between each display using the 8086 microprocessor's timing capabilities.

Displaying Characters: The program uses binary values (01111001b, 01110001b, 01110110b) to control the segments of the 7-Segment LED to form the characters 'E', 'F', and 'H'.

Delay Routines: Specific delay routines are used to introduce a 5-second delay between character displays. These routines utilize the 8086 microprocessor's timing features.

Looping: After displaying 'H', the program loops back to the beginning of the main loop to repeat the sequence indefinitely.

Code:

```
DSEG    SEGMENT 'DATA'
DSEG    ENDS
SSEG    SEGMENT STACK   'STACK'
      DW      100h    DUP(?)
SSEG    ENDS
CSEG    SEGMENT 'CODE'
START   PROC    FAR
; Store return address to OS:
   PUSH    DS
   MOV     AX, 0
   PUSH    AX

; set segment registers:
   MOV     AX, DSEG
   MOV     DS, AX
   MOV     ES, AX

MOV DX, 2030h; first Seven Segment Display

continue:
         MOV CX, 2

display:

         ;E
         MOV AL,01111001b
         out dx,al

   mov bx,cx
   mov CX,004Ch
   mov DX,4B40h
   mov ah,86h
   int 15h
   mov cx,bx
   MOV DX, 2030h
```

```
   ;F
   MOV AL,01110001b
   out dx,al
   mov bx,cx
   mov CX,004Ch
   mov DX,4B40h
   mov ah,86h
   int 15h
   mov cx,bx
   MOV DX, 2030h


   ;H
   MOV AL,01110110b
         out dx,al

   mov bx,cx
   mov CX,004Ch
   mov DX,4B40h
   mov ah,86h
   int 15h
   mov cx,bx
   MOV DX, 2030h



         LOOP display

         JMP continue

; return to operating system:
   RET
START   ENDP

CSEG    ENDS

END    START    ; set entry point.
```

Result:

Figure1: Display E for 5 seconds

Figure2: Display F for 5 seconds

Figure3: Display H for 5 seconds

This keeps on repeating in loop till user stops it manually.

Conclusion:

In this laboratory experiment, we successfully utilized the 8086 Interfacing Trainer in Kit mode to display the characters 'E', 'F', and 'H' on a 7-Segment LED display. The program implemented accurate timing control to introduce a 5-second delay between character displays, resulting in the desired output sequence.

This experiment demonstrated the principles of microprocessor programming, interfacing with output devices, and precise timing control. By effectively implementing the provided 8086 assembly code, we achieved the objective of displaying characters on the 7-Segment LED.