**Experiment-4: Implementation of Traffic Light Signal and thermometer in emu8086**

**Task-1: Traffic Light Signal**

; controlling external device with 8086 microprocessor.

; realistic test for c:\emu8086\devices\Traffic\_Lights.exe

#start=Traffic\_Lights.exe#

name "traffic"

mov ax, all\_red

out 4, ax

mov si, offset s1

next:

mov ax, [si]

out 4, ax

; wait 5 seconds (5 million microseconds)

mov cx, 4Ch ; 004C4B40h = 5,000,000

mov dx, 4B40h

mov ah, 86h ;??

Package for interuption

int 15h ;for delay

add si, 2 ; next situation, variables are 1 empty memory cell apart

cmp si, sit\_end

jb next

mov si, offset s1

jmp next

; FEDC\_BA98\_7654\_3210

s1 dw 0000\_0011\_0000\_1100b

s2 dw 0000\_0101\_0001\_0100b

s3 dw 0000\_1000\_0110\_0001b

s4 dw 0000\_1000\_1010\_0010b

sit\_end = $

all\_red equ 0000\_0010\_0100\_1001b

**Task-2: Thermometer**

#start=thermometer.exe# ;add thermometer as external device

#make\_bin#

name "thermo"

; set data segment to code segment:

mov ax, cs ;

mov ds, ax

start:

in al, 125 ;in=>to read data, 125 is the input port of thermometer, The OUT instruction writes data from a register or memory to an I/O port.

cmp al, 60

jl low

cmp al, 80

jle ok

jg high

low:

mov al, 1

out 127, al ; turn heater "on"., 127 =>output port of thermometer

jmp ok

high:

mov al, 0

out 127, al ; turn heater "off".

ok:

jmp start ; endless loop.

;here al(hex)==dataport 125(bin)==degree(dec)