**Course Code: CE450**

**Lab 05**

**PREPARED BY**

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**Github Url:** <https://github.com/KhandokerSamiulHoque/CE-450-lab-05.git>

NOTE: video is in this github link , I uploaded over there. However sometimes when we try to copy and paste it from raspberry pi os linux to our real windows sometimes it creates problem in indentation please kindly look over that thing professor , however I have crosschecked several times to make things right.

1.

import RPi.GPIO as GPIO

import time

GPIO.setwarnings(False)

SDI = 11

RCLK = 12

SRCLK = 13

segCode = [0x3f, 0x06, 0x5b, 0x4f, 0x66, 0x6d, 0x7d, 0x07, 0x7f, 0x6f, 0x77, 0x7c, 0x39, 0x5e, 0x79, 0x71, 0x80]

def print\_msg():

    print('Program is running...')

    print('Please press Ctrl+C to end the program...')

def setup():

    GPIO.setmode(GPIO.BOARD)    *# Number GPIOs by its physical location*

    GPIO.setup(SDI, GPIO.OUT)

    GPIO.setup(RCLK, GPIO.OUT)

    GPIO.setup(SRCLK, GPIO.OUT)

    GPIO.output(SDI, GPIO.LOW)

    GPIO.output(RCLK, GPIO.LOW)

    GPIO.output(SRCLK, GPIO.LOW)

def hc595\_shift(dat):

    for bit in range(0, 8):

        GPIO.output(SDI, 0x80 & (dat << bit))

        GPIO.output(SRCLK, GPIO.HIGH)

        time.sleep(0.001)

        GPIO.output(SRCLK, GPIO.LOW)

    GPIO.output(RCLK, GPIO.HIGH)

    time.sleep(0.001)

    GPIO.output(RCLK, GPIO.LOW)

def loop():

    while True:

        for i in range(0, len(segCode)):

            hc595\_shift(segCode[i])

            time.sleep(0.5)

def destroy():

*# When the program ends, this function is executed.*

    GPIO.cleanup()

print\_msg()

setup()

try:

    loop()

except KeyboardInterrupt:

    destroy()

2.

import RPi.GPIO as GPIO

import time

GPIO.setwarnings(False)

*#Display 1*

SDI1 = 11

RCLK1 = 12

SRCLK1 = 13

*#Display 2*

SDI2 = 15

RCLK2 = 16

SRCLK2 = 18

number\_hex = [0x3f, 0x06, 0x5b, 0x4f, 0x66, 0x6d, 0x7d, 0x07, 0x7f, 0x6f]

alphabet\_hex = [

    0x77, 0x7C, 0x58, 0x5E, 0x79, 0x71, 0x6F, 0x76, 0x06, 0x0E, 0x70, 0x38, 0x37, 0x54, 0x5C, 0x73,

    0x67, 0x50, 0x6D, 0x78, 0x1C, 0x62, 0x7E, 0x76, 0x72, 0x5B

]

def print\_msg():

    print('Program is running...')

    print('Please press Ctrl+C to end the program...')

def setup():

    GPIO.setmode(GPIO.BOARD)

    GPIO.setup(SDI1, GPIO.OUT)

    GPIO.setup(RCLK1, GPIO.OUT)

    GPIO.setup(SRCLK1, GPIO.OUT)

    GPIO.setup(SDI2, GPIO.OUT)

    GPIO.setup(RCLK2, GPIO.OUT)

    GPIO.setup(SRCLK2, GPIO.OUT)

    GPIO.output(SDI1, GPIO.LOW)

    GPIO.output(RCLK1, GPIO.LOW)

    GPIO.output(SRCLK1, GPIO.LOW)

    GPIO.output(SDI2, GPIO.LOW)

    GPIO.output(RCLK2, GPIO.LOW)

    GPIO.output(SRCLK2, GPIO.LOW)

def hc595\_shift(dat, sdi, rclk, srclk):

    for bit in range(0, 8):

        GPIO.output(sdi, 0x80 & (dat << bit))

        GPIO.output(srclk, GPIO.HIGH)

        time.sleep(0.001)

        GPIO.output(srclk, GPIO.LOW)

    GPIO.output(rclk, GPIO.HIGH)

    time.sleep(0.001)

    GPIO.output(rclk, GPIO.LOW)

def disp\_num(num):

    tens = num // 10

    units = num % 10

    if tens == 0:

        hc595\_shift(0x00, SDI1, RCLK1, SRCLK1)

    else:

        hc595\_shift(number\_hex[tens], SDI1, RCLK1, SRCLK1)

    hc595\_shift(number\_hex[units], SDI2, RCLK2, SRCLK2)

def disp\_alph(char):

    index\_char = ord(char.upper()) - ord('A')

    hc595\_shift(0x00, SDI1, RCLK1, SRCLK1)

    hc595\_shift(alphabet\_hex[index\_char], SDI2, RCLK2, SRCLK2)

def loop():

    while True:

        for num in range(1, 26):

            disp\_num(num)

            time.sleep(1)

        for char in range(ord('A'), ord('Z')+1):

            disp\_alph(chr(char))

            time.sleep(1)

def destroy():

    GPIO.cleanup()

print\_msg()

setup()

try:

    loop()

except KeyboardInterrupt:

    destroy()