

Experiment No: 09

BECS 31421

INTERFACING 7-SEGMENT DISPLAY

Student Name : W.K.G.K Jayawardana

Student Number : EC/2021/006

Partner Name : S.M.A.D.R Pabasarani

Partner Number : EC/2021/007

Date Performed : 30/05/2025

Date of Submission : 30/05/2025

DISCUSSION

In this experiment, we successfully interfaced a common cathode 7-segment display with a PIC16F628A microcontroller to achieve a simple counter from 0 to 9. We used C to write the program with MikroC PRO, simulated it with PROTEUS before uploading it to the microcontroller with Pickit 3.

The counter logic is implemented with the use of a push button on the RB7 pin. Each time the button is pressed, the counter is increased by one. The variable stop ensures that one count is registered per press and stops multiple counting due to button bouncing. When the count is 9, it resets to 0, indicating good handling of overflow conditions. The numbers displayed on the 7-segment are handled using a constant array named numbers that contains the segment codes for the digits 0 to 9.

PORTB is used to send the BCD output to the display. 100-millisecond delay is added for visual clearing and debounce action. The TRIS registers are initialized for setting input and output pins — RA0 and RB7 are made inputs, while the rest are made outputs.

This lab helped in learning the fundamentals of display interfacing, button handling, and simple counter logic, which form the fundamentals of developing real-world embedded systems like timers, scoreboards, and digital meters.

SOURCE CODE

```
const unsigned char numbers[10] = {0x3F, 0x06, 0x5B, 0x4F, 0x66, 0x6D, 0x7D, 0x07, 0x7F,
0x6F};

    int stop = 0;

    int count = 0;

void main(){

    TRISA = 0b00000001;
    TRISB = 0b10000000;
    PORTA = 0x00;
    PORTB = 0x00;

    while(1) {
        if(PORTB.RB7 == 1 && stop == 0){
            count++;
            if(count > 9){
                count = 0;
            }
            PORTB = numbers[count];
            stop = 1;
            Delay_ms(100);
        }
        else if (PORTB.RB7 == 0){
            stop = 0;
        }
    }
}
```

SIMULATION SCREENSHOTS







