SMART VEHICLE PARKING SYSTEM

GROUP G5
E/15/056
E/15/058
E/15/063

Smart Vehicle Parking System

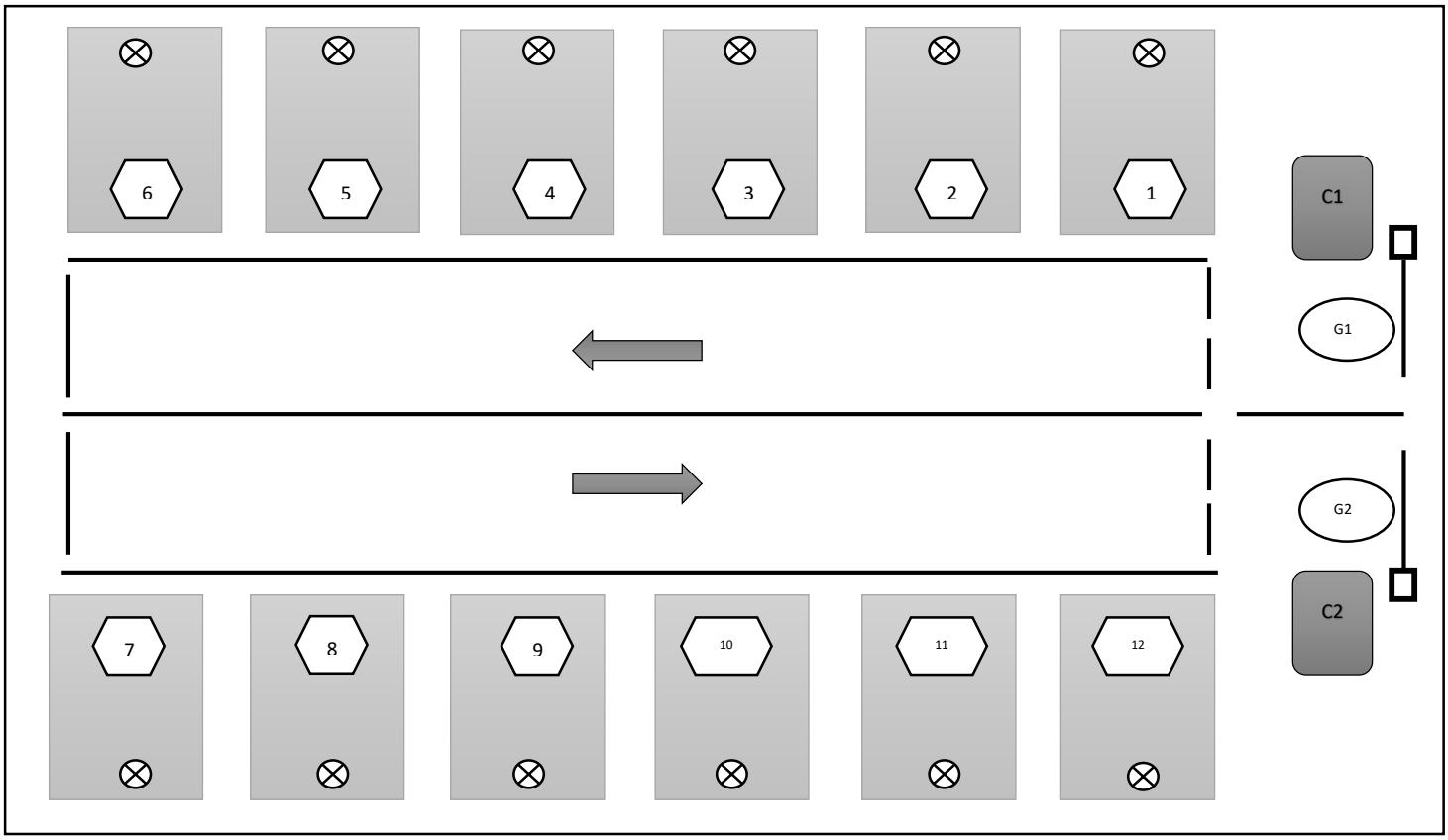

Figure 1

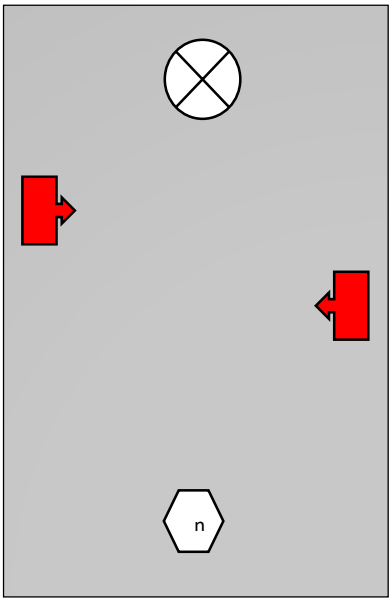

Figure 2

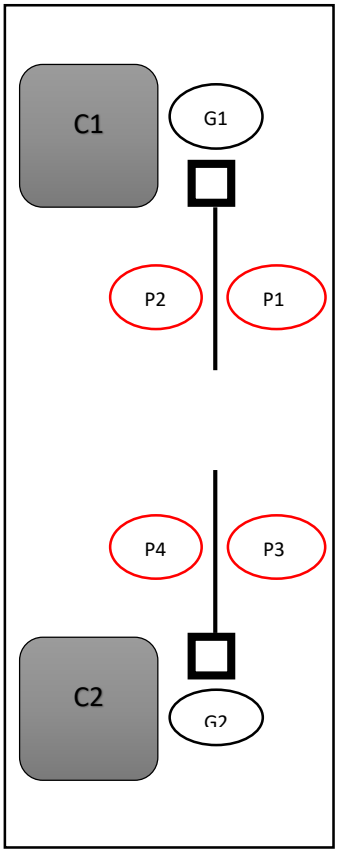

Figure 3

As Group G5 (E/15/056, E/15/058, E/15/063), we have planned to design a smart vehicle parking system.

The structure of the vehicle park is shown in Figure 1. But in our project we hope to demonstrate only one parking area process and the process of the gate.

The process of a parking area

As shown in Figure 2,there are two obstacle avoidance sensor modules(Red shapes).They detect a vehicle's arrival to the parking area and returns a signal to the counters(C1 & C2).The counters take notes the parking position and the time when it is parked.

Using those data, counters calculate the parking fee. Not only that if the vehicle is parked in the day time but it is still parked in the night time automatically a light can be seen at the parking area. When the vehicle leaves the parking area or the day time comes, the light disappears.

The process of the gate

As shown in Figure 3, there are two obstacle avoidance sensor modules at each gate (Gate 1 – P1 & P2).When a vehicle comes to the gate from outside,P1 sensor module identifies it and returns a signal to open the gate and the mechanism of opening the gate works. After that the vehicle passes away the gate,P2 sensor module identifies that and returns a signal to close the gate.

When a vehicle leaves the parking area the above process of the gate works and the parking fee is noticed at the counters.

Here we plan to enter vehicles from gate 1 and return them from gate 2 for the convenience of the people. Likewise if the parking area is full, it is noticed at gates.

So, this is the basic idea of our project process and we hope to develop this further.

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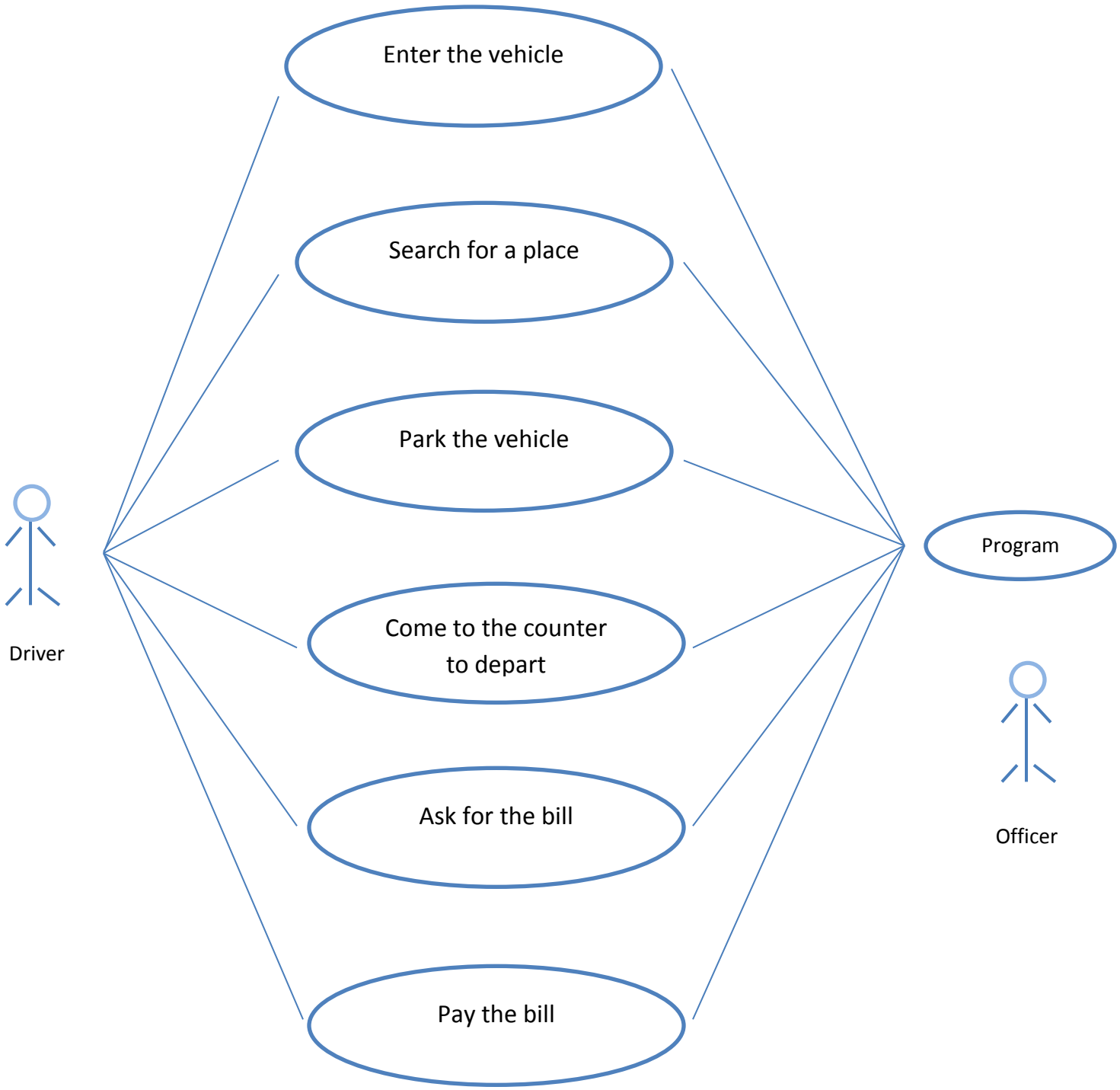
USER CASE DIAGRAM



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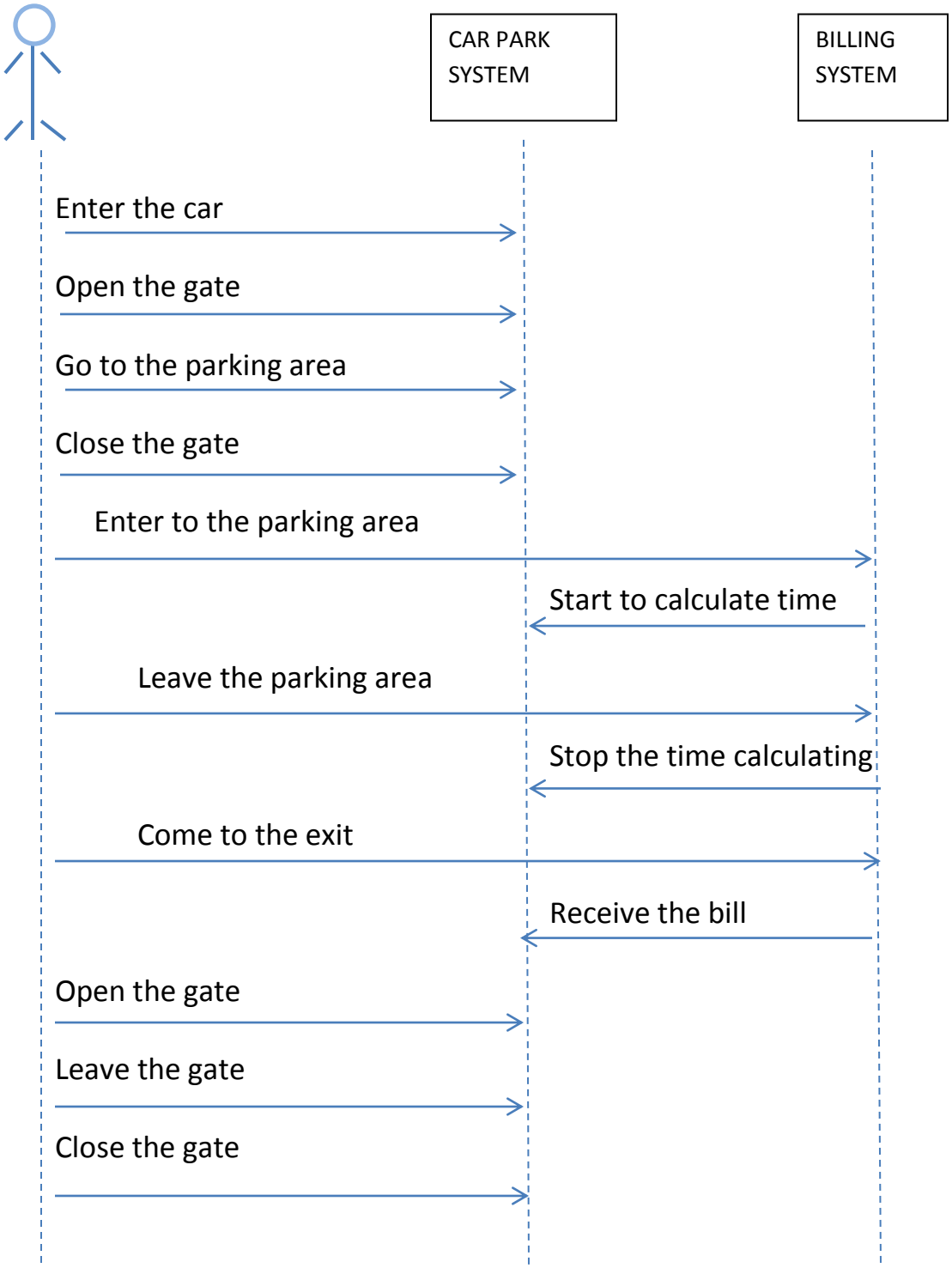
SEQUENCE DIAGRAM



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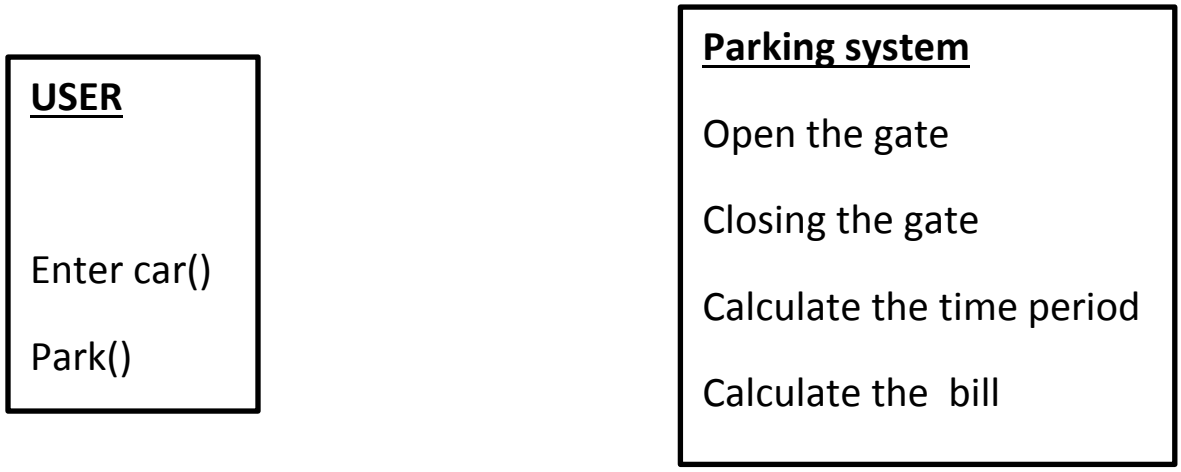
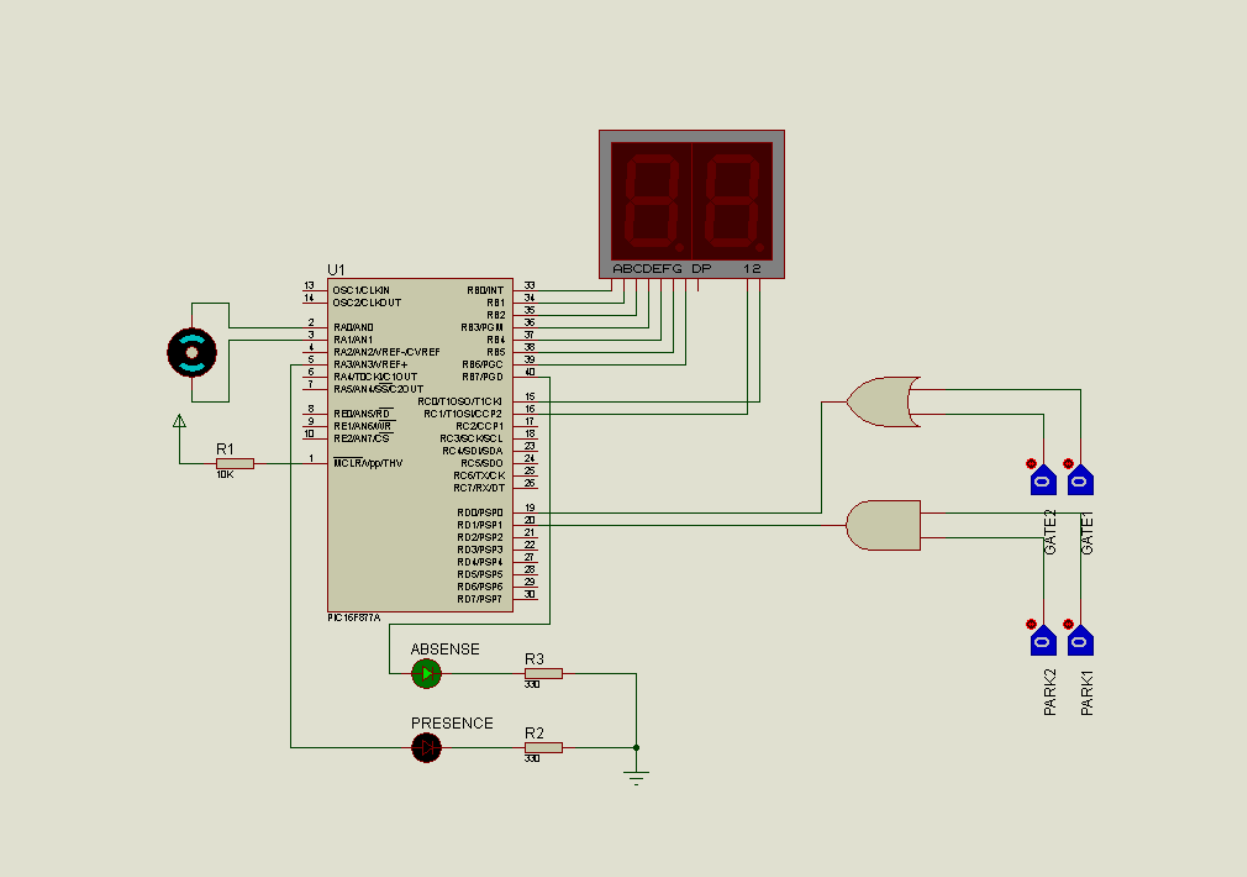
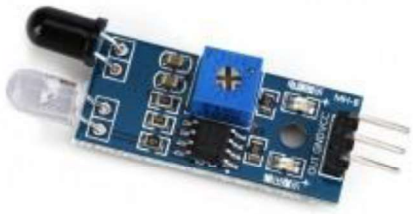
UML CLASS DIAGRAM



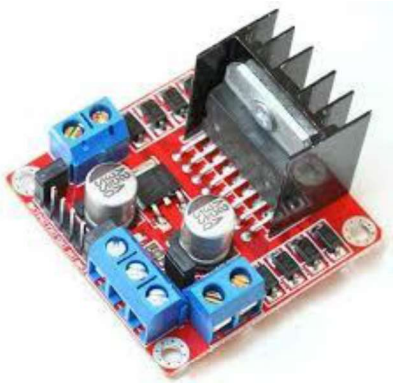
CIRCUIT DIAGRAM:



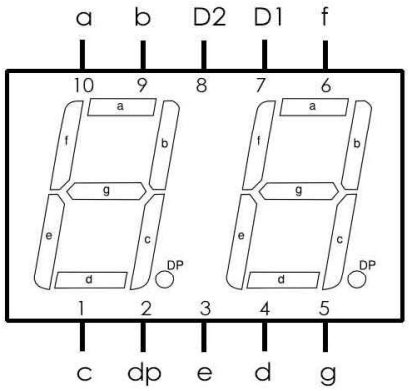
ADDITIONAL COMPONENTS USED



Obstacle detecting sensor



L298D Motor controller



Seven segment display

CODE

```
        processor   16f877a
        #include    <p16f877a.inc>

        __CONFIG _FOSC_XT & _WDTE_OFF & _PWRTE_OFF & _BOREN_OFF & _LVP_OFF &
        _CPD_OFF & _WRT_OFF & _CP_OFF

        org         0x00
        goto        Main
        org         0x04
        goto        Interrupt

        Count1      equ 0x20
        Count2      equ 0x21
        Count3      equ 0x22
        Micros      equ 0x23
        Ones        equ 0x24
        Tens        equ 0x25

Main:
        bsf         STATUS,5
        movlw       b'00000000'
        movwf       TRISA
        movlw       b'00000000'
        movwf       TRISB
        movlw       b'00000000'
        movwf       TRISC
        movlw       b'00000011'
        movwf       TRISD
        movlw       b'00000111'
        movwf       OPTION_REG
        bcf         STATUS,5
        bsf         INTCON,7
        bsf         INTCON,5
        clrf        Ones
        clrf        Tens
        clrf        Micros
```

```
Check1:
        bsf     PORTB,7
        bcf     PORTA,3
        btfsc   PORTD,0
        goto    Gopen
        bcf     PORTA,0
        goto    Check1

Check2:
        btfss   PORTD,0
        goto    Gclose
        bcf     PORTA,0
        goto    Check2

Gopen:
        bsf     PORTA,0
        call    Delay2
        bcf     PORTA,0
        goto    Check2

Gclose:
        bsf     PORTA,1
        call    Delay2
        bcf     PORTA,1

Check3:
        btfsc   PORTD,1
        goto    LED
        bcf     PORTA,3
        bsf     PORTB,7
        clrf    Ones
        clrf    Tens
        clrf    Micros
        goto     Check3

LED:
        bcf     PORTB,7
        bsf     PORTA,3
        goto    Timer
```

```
Timer:
        movlw   b'00000010'
        movwf   PORTC
        movf    Ones, W
        call    Table
        movwf   PORTB
        call    Delay1
        movlw   b'00000001'
        movwf   PORTC
        movf    Tens, W
        call    Table
        movwf   PORTB
        call    Delay1
        btfss   PORTD,1
        goto    Check4
        goto    Timer

Check4:
        clrf    Ones
        clrf    Tens
        clrf    Micros
        bsf     PORTB,7
        bcf     PORTA,3
        btfsc   PORTD,0
        goto    GopenAgain
        bcf     PORTA,0
        goto    Check4

Check5:
        btfss   PORTD,0
        goto    GcloseAgain
        bcf     PORTA,0
        goto    Check5

GopenAgain:
        bsf     PORTA,0
        call    Delay2
        bcf     PORTA,0
        goto    Check5
```

```
GcloseAgain:
        bsf     PORTA,1
        call    Delay2
        bcf     PORTA,1
        goto    Check1

Interrupt:
        bcf     INTCON,7
        bcf     INTCON,5
        incf    Micros,1
        movf    Micros,0
        sublw   b'00001111'
        btfsc   STATUS,2
        goto    Inc_Ones
        goto    ReIn

Inc_Ones:
        clrf    Micros
        incf    Ones, 1
        movf    Ones, 0
        sublw   b'00001010'
        btfsc   STATUS,2
        goto    Inc_Tens
        goto    ReIn

Inc_Tens:
        clrf    Ones
        incf    Tens, 1
        movf    Tens, 0
        sublw   b'00001010'
        btfsc   STATUS,2
        clrf    Tens
        goto    ReIn

ReIn:
        bcf     INTCON,2
        bsf     INTCON,7
        bsf     INTCON,5
        retfie
```

```
Table:
        addwf       PCL
        retlw       b'00111111'   ;digit 0
        retlw       b'00000110'   ;digit 1
        retlw       b'01011011'   ;digit 2
        retlw       b'01001111'   ;digit 3
        retlw       b'01100110'   ;digit 4
        retlw       b'01101101'   ;digit 5
        retlw       b'01111101'   ;digit 6
        retlw       b'00000111'   ;digit 7
        retlw       b'01111111'   ;digit 8
        retlw       b'01101111'   ;digit 9

Delay1:
        loop        decfsz Count1,F
        goto        loop
        return

Delay2:
        loop1       decfsz  Count2,1
        goto        loop1
        decfsz      Count3,1
        goto        loop1
        return

End
```