**Discussion**

**Date: 04/04/2025**

**Experiment no: 03**

**Student No: EC/2021/006**

In this experiment, we implemented a simple LED chaser circuit using PIC 16F628A microcontroller. We understood how to configure the input/output pins of the microcontroller and use them to control external devices, in this case, LEDs. The LED chaser effect, also known as the Knight Rider effect.

We used MikroC PRO compiler to write the program and simulated the circuit in PROTEUS before uploading the HEX file to the microcontroller using MPLAB IPE and the Pickit 3 programmer. The microcontroller was programed to use PORTB pins as output. The TRISB register was set to 0x00 to configure PORTB as output. CMCON register was set to 0x07 to disable the comparator module.

The LED movement was controlled using shift operations in two loops first shifting the light from left to right, then back from right to left. A delay of 100 ms between each shift was used to produce a smooth animation. The delay was managed using the Delay\_ms() function.

**Source Code**

**A screenshot of a computer program

AI-generated content may be incorrect.**

void knightrider(void) {

int i;

// Step 1: Set all pins of PORTB as outputs

TRISB = 0x00; // Hint: Set all pins of PORTB as outputs

// Step 2: Initialize PORTB with the first LED lit

PORTB = 0x01; // Hint: Initialize PORTB to light the first LED (RB0)

// Step 3: Define the left shift loop

for (i = 1; i <= 7; i++) {

PORTB = (PORTB << 1); // Hint: Shift the lit LED to the left

// Step 4: Delay for smoother animation

Delay\_ms(100); // Hint: Delay for smoother animation

}

// Step 5: Define the right shift loop

for (i = 7; i >= 1; i--) {

PORTB = (PORTB >> 1 ); // Hint: Shift the lit LED to the right

// Step 6: Delay for smoother animation

Delay\_ms(100);

}

}

void main() {

CMCON = 0x07; // Hint: Disable comparators

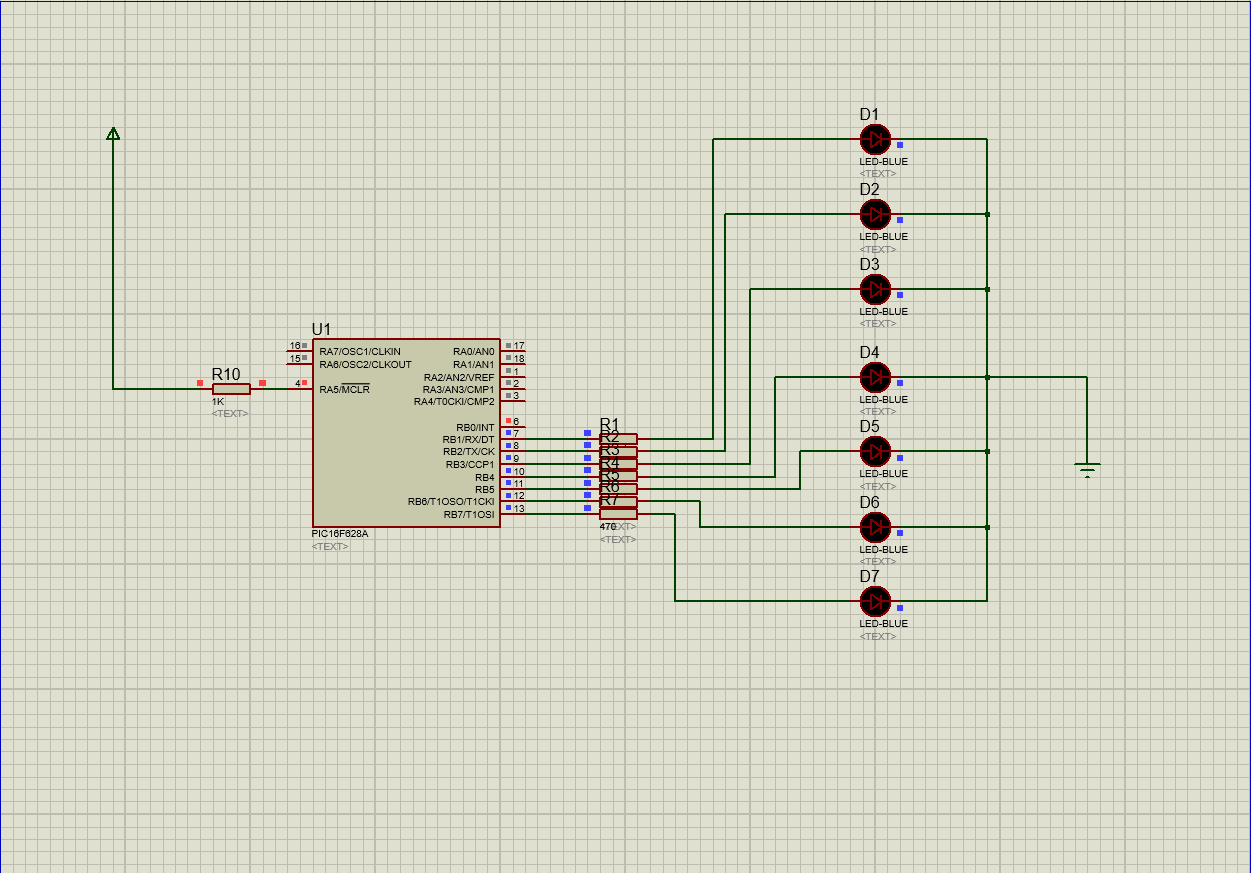
TRISA = 0xff; // Hint: Set all PORTA pins as digital I/O

while (1) // Hint: Enter a condition for the infinite loop

knightrider(); // Call the knightrider function

}

**Porteous Simulation**



A computer screen shot of a computer

AI-generated content may be incorrect.A computer screen shot of a circuit board

AI-generated content may be incorrect.