8. Place an IR sensor on either side of a doorway to count the number of people entering and exiting. Display the count on a 7-segment display. Use the ultrasonic sensor to confirm direction by measuring the time an object passes between the two IR sensors.

Program :

```
const int irSensor1 = 2;    // IR sensor for entry
const int irSensor2 = 3;    // IR sensor for exit
const int trigPin = 4;        // Trigger pin for ultrasonic sensor
const int echoPin = 5;       // Echo pin for ultrasonic sensor
volatile int count = 0;       // Count of people
bool lastState1 = LOW;       // Last state for IR sensor 1
bool lastState2 = LOW;       // Last state for IR sensor 2
void setup() {
  Serial.begin(9600);
  pinMode(irSensor1, INPUT);
  pinMode(irSensor2, INPUT);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
                              // Setup 7-segment display pins here
  attachInterrupt(digitalPinToInterrupt(irSensor1), entryDetected, RISING);
  attachInterrupt(digitalPinToInterrupt(irSensor2), exitDetected, RISING);
}
void loop() {
  // function to display the count on the 7-segment display
  displayCount(count);
```

```
  delay(100);       // Delay to reduce processing load
}
void entryDetected() {
                        // Confirm direction using ultrasonic sensor
  if (confirmDirection()) {
    count++;  // Increment count for entry
    Serial.print("Entered: ");
    Serial.println(count);
  }
}
void exitDetected() {
                        // Confirm direction using ultrasonic sensor
  if (confirmDirection()) {
    count--;  // Decrement count for exit
    Serial.print("Exited: ");
    Serial.println(count);
  }
}
bool confirmDirection() {
  long duration, distance;
                                // Trigger ultrasonic sensor
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
```

```
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance = (duration * 0.034 / 2);              // Calculate distance in cm
  if (distance < 50) {    // Example threshold
    return true;             // Confirm movement
  }
  return false;           // No movement detected
}
void displayCount(int count) {
                    // Code to display count on the 7-segment display
}
```