An Automatic Car Parking System

This project demonstrates **an automatic car parking system** built using an Arduino Uno, two IR sensors, a servo motor, and an LCD display. Here is a brief overview and functionality of the setup:

Components Used:

- **Arduino Uno:** Acts as the main microcontroller to process inputs and control outputs.
- **IR Sensors**: Two sensors are used—one at the entrance (before the gate) and the other within the parking slot area to monitor cars.
- **Servo Motor:** Controls the opening and closing of the parking gate.
- **LCD Display:** Provides feedback messages for users such as "Welcome" or "Parking Full."

Functionality:

First IR Sensor (Entry Control):

- This sensor is positioned before the gate. When a car crosses the line of this sensor, it signals the Arduino to check if a parking slot is available.
- If a slot is available, the gate opens, and the LCD displays a welcome message.
- If all parking slots are occupied (maximum capacity of 4 cars), the gate remains closed, and a "Parking Full" message is displayed on the LCD.

Second IR Sensor (Car Counting):

- This sensor counts the number of cars that have entered and are currently parked.
- The system keeps track of the available slots and updates accordingly (e.g., 3 slots occupied means 1 slot available).
- When the parking reaches its maximum capacity of 4 cars, it informs the Arduino system to prevent further entries.

Advantages:

- Automated Entry Management: Reduces the need for manual intervention by opening the gate automatically when space is available.
- Efficient Slot Monitoring: Keeps an accurate count of parked vehicles and available slots.
- User Feedback: Provides clear messages to drivers about the status of the parking space.

This system offers a practical and efficient way to manage limited parking spaces using readily available electronic components, showcasing how simple automation can improve user experience in real-world scenarios.