Smart Trolley with RFID Billing – Connection Diagram

🔹 Arduino Mega Connections

L298N Motor Driver

- ENA → Mega pin **6** (PWM)
- IN1 → Mega pin **22**
- IN2 → Mega pin **23**
- IN3 → Mega pin **24**
- IN4 → Mega pin **25**
- ENB → Mega pin **7** (PWM)
- Vmotor (12V) → Motor battery + (7.4–12V)
- GND → Motor battery − and Arduino GND (common ground)
- OUT1/OUT2 → Left DC Motor
- OUT3/OUT4 → Right DC Motor

Ultrasonic Sensors (HC-SR04)

- **Left Sensor**
- VCC → 5V
- GND → GND
- Trig → Mega pin **30**
- Echo → Mega pin **31**
- **Center Sensor**
- VCC → 5V
- GND → GND
- Trig → Mega pin **32**
- Echo → Mega pin **33**
- **Right Sensor**
- VCC → 5V
- GND → GND
- Trig → Mega pin **34**
- Echo → Mega pin **35**

RFID RC522 (SPI)

- VCC → **3.3V** on Mega (⚠️ *Do not connect to 5V*)
- GND → GND
- SDA (SS) → Mega pin **53**
- SCK → Mega pin **52**
- MOSI → Mega pin **51**
- MISO → Mega pin **50**
- RST → Mega pin **5**

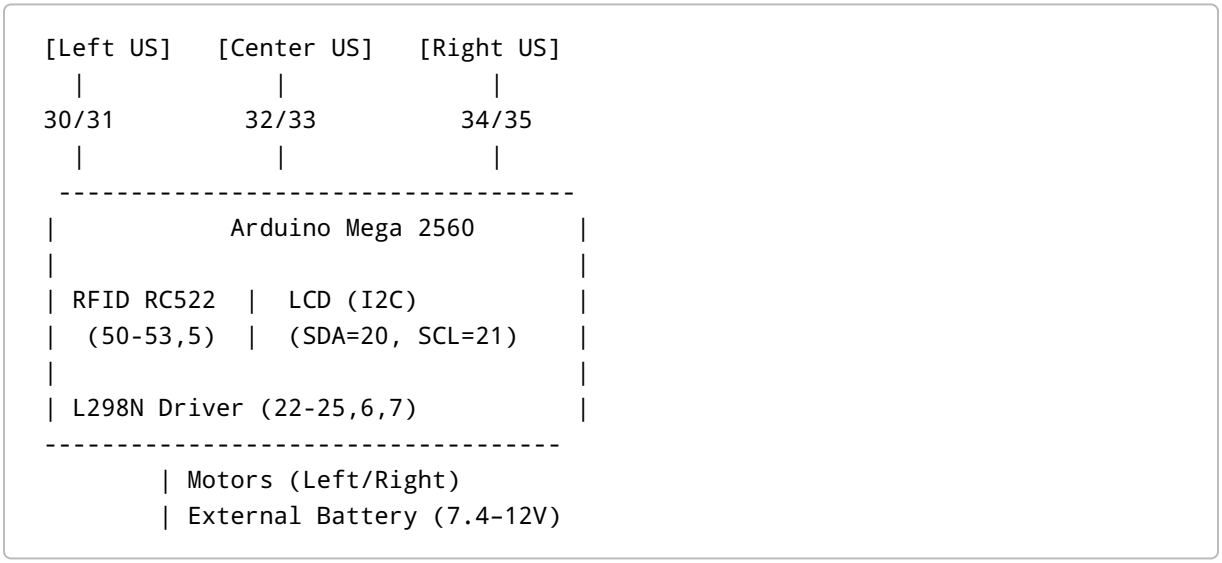
I²C LCD (16×2 with I²C Backpack)

- VCC → 5V
- GND → GND
- SDA → Mega pin **20**
- SCL → Mega pin **21**

🔹 Power Connections

- **Motors** powered from external 7.4–12V battery → connect to **L298N Vmotor**.
- **Arduino Mega** can be powered from USB during testing, or from 9–12V adapter (VIN).
- **Common Ground is essential** → connect Arduino GND, L298N GND, sensor GNDs, and RFID GND together.

🔹 ASCII Block Diagram



✅This wiring supports: - **2 DC motors** (driven by L298N) - **3 ultrasonic sensors** (human following) - **RC522 RFID** (product scanning) - **I²C LCD** (bill display)

⚠️Important: Ensure **RC522 is always on 3.3V** and share **common ground** across all modules.