Smart Shopping Cart (RFID-based)

CS 578 Wireless Networks
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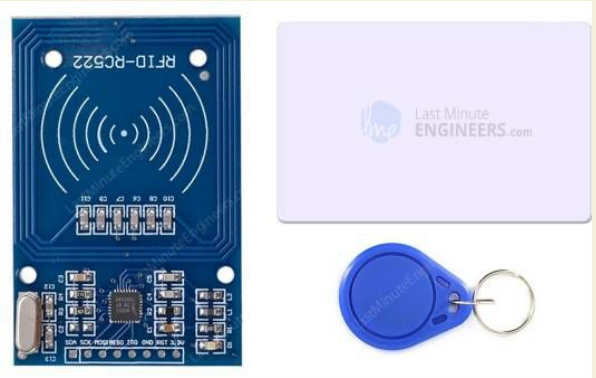
San Diego State University : May 5, 2025

Project Recap

- Automatically scans products using RFID
- Displays item names and prices on an LCD screen
- Tracks total cost as items are added
- Powered by Arduino for real-time processing
- Simplifies and speeds up the shopping experience

Core Components

- **Arduino Mega 2560** – the brain of the cart
- **RC522 RFID Reader** – scans product tags
- **RFID Tags** – attached to each item
- **16x2 I2C LCD** – displays items and total
- **Buzzer** - For the sound



Team Roles

Mohamed Amine Boughou

Software Developer & Hardware Tester

- Wrote and uploaded the Arduino code
- Integrated RFID, LCD, and buzzer functionality
- Conducted software debugging and hardware testing

Fadi Bahri

Hardware Assembler & Debugger

- Assembled all hardware components
- Followed the wiring diagram for accurate connections
- Troubleshot and fixed wiring and connection issues

Mahmad Shbaneeh

Hardware Procurement & Testing

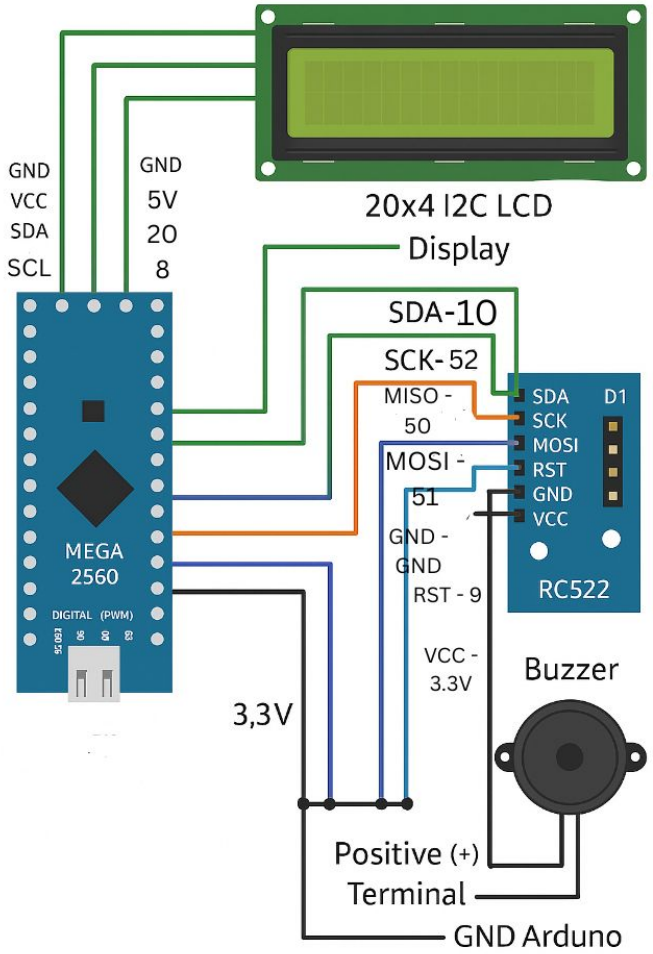
- Responsible for getting all the electronic parts
- Checked if parts work together
- Helped test the hardware

How can we improve the device

- Add a load cell for weight verification
- Build a mobile app or web dashboard
- Use Wi-Fi (ESP8266/ESP32) for database connection
- Integrate voice feedback for accessibility
- Enable digital payment through NFC

Diagram and Code

The Code



How is our solution effective, efficient, and reasonable:

Effective: Scans items instantly and displays prices in real-time
Efficient: Reduces checkout time and manual work
Reasonable: Uses low-cost components like Arduino and RFID
Reliable: Simple design with minimal hardware failures
Scalable: Can be expanded with Wi-Fi, apps, or payment systems
User-Friendly: Easy for customers to use without training

Conclusion & Demo