Ampere Mate - Feature Logic Breakdown

1. ⚡ Charge Time Calculator

How the Logic Works: This is a simple rate calculation. The logic finds out how much energy (in kWh) you need to add to the battery and then divides that by the charger's speed (in kW).

Calculate Energy Needed:
- Charge % Needed = Target Charge % - Current Charge %
- Energy Needed (kWh) = Battery Capacity (kWh) * (Charge % Needed / 100)

Example: 40.5 kWh * 0.60 = 24.3 kWh

Calculate Time:
- Time (hours) = Energy Needed (kWh) / Charger Power (kW)

Example: 24.3 / 7.2 = 3.375 hours ≈ 3 hours 23 minutes.

2. 💰 Cost Calculator

How the Logic Works: Calculates cost per km for both EV and petrol, then finds the savings.

EV Cost per km:
- EV Cost = (Efficiency (Wh/km) / 1000) * Electricity Cost

Petrol Cost per km:
- Petrol Cost = Petrol Price / Mileage

Savings:
- Savings = Petrol Cost - EV Cost

3. 🛣️ Trip Log

How the Logic Works: Calculates energy used and trip efficiency.

Energy Used:
- % Used = Starting Charge % - Ending Charge %
- Energy (kWh) = Battery Capacity * (% Used / 100)

Efficiency:
- Efficiency (Wh/km) = (Energy Used (kWh) / Distance) * 1000

4. ⏳ Battery Health Monitor

How the Logic Works: Compares original vs. current capacity.

Health % = (Current Capacity / Original Capacity) * 100

Status:
- >95%: Excellent
- >85%: Good
- >70%: Fair
- Else: Degraded

Logs stored in local storage as {"date": "YYYY-MM-DD", "health": value}.

5. 📖 Glossary
Predefined array of EV terms and meanings displayed with a search filter.

6. 🏠 Installer Cost Estimator
Rules-based system using base costs and cable lengths.

- Base Cost by Charger Type (e.g., 3.3kW = $400, 7.2kW = $600)
- Cable Cost = Length * $15/m
- Estimated Cost Range = (Base + Cable) ± 15%

7. ❄️ Pre-Heat/Pre-Cooling Cost
Uses fixed 2.5 kW assumption.

- Time (h) = Minutes / 60
- Energy (kWh) = 2.5 * Time
- Cost = Energy * Electricity Cost

8. 🔧 Tyre Log
Logs and tracks tyre check dates.

- Saves lastTyreCheckDate in local storage.
- Calculates Days Since Last Check.
- Alerts if Days > 30 (Overdue), else OK.