Project Report:
Smart EV Charging Network Simulation

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Work Distribution:

- Code done by Talha Ahmad.

- Research And Debugging done by Bilal.

Requirements:

- Manage users and their EV.
- Allow user to book charging stations and time slots.
- Use Solar or Grid energy based on availability.
- Simulate charging stations with multiple docks that are expandable.
- Track energy delivered to each EV.
- Prevent Overload.
- Calculate bills using real time pricing rules.
- Handle many EV users, EVs and stations to reflect a city scale deployment.

Main Classes:

1. User.
2. EV.
3. ChargingStation.
4. ChargingDock.
5. Booking.
6. EnergySource (abstract).
    1. SolarPower.
    2. GridPower.
7. Invoice.
8. PricingEngine.
9. LoadBalancer.
10. AnalyticsEngine.
11. NotificationManager

Conclusion:

This project successfully simulates a smart EV charging system, demonstrating object-oriented programming skills and core principles like encapsulation, inheritance, and polymorphism. The simulation efficiently handles multiple users, vehicles, stations, and dynamic pricing, providing an efficient model for city-wide EV charging networks.