

Ride Sharing App

You are tasked with designing and implementing a ride-sharing application where passengers can request rides, and drivers can be matched to them based on proximity. The application should handle different types of vehicles (such as cars, bikes, luxury cars) and support multiple fare calculation strategies. The system must notify both passengers and drivers about ride statuses and calculate the fare based on the type of ride and distance traveled.

Requirements-I

Ride Request:

- Passengers can request a ride by providing their location and the desired destination.
- The system should calculate the distance between the passenger's location and the driver's location.
- The system must assign the **nearest available driver** to the passenger.

Vehicle Types:

- The system should support different vehicle types (e.g., car, bike, luxury car).
- Each vehicle type should have a different base fare per kilometer.

Fare Calculation:

- The system should use **different fare strategies** (e.g., standard fare, shared fare, luxury fare).

Requirements-II

Ride Status Notifications:

- Both the passenger and the driver should be notified of ride statuses (e.g., ride started, ride completed).
- Use the **Observer Pattern** to notify users about ride status updates.

Ride Matching:

- Drivers should be assigned to passengers based on **proximity**.
- After a ride is completed, the driver becomes available for new ride requests.