Case Study

اَللّٰهُمَّ اُرْزُقْنِى عِلْمًا نَافِعًا وَاسِعًا عَمِيْقًا

اَللّٰهُمَّ اُرْزُقْنِى رِزْقًا وَاسِعًا حَلَالًا طَيِّبًا مُبَارَكًا مِنْ عِنْدِكَ

Practice Problem

The Taxi company has many taxis, that are used to transport an individual (or small group) from one location to another. Company has the information of the model and Number Plate of the Taxis. When the company receives a call from an individual, it asks for the individual's name, phone number and pickup location then it tries to schedule a vehicle to pick up the Passenger. When a vehicle arrives at a pick-up location, the taxi notifies the company that it has reached the pick-up location. Similarly, when a passenger is dropped off at their destination, the taxi notifies the company that it has dropped the passenger.

Practice Problem: Tasks

1. Extract the main **Classes (entities)** for above system.
2. Find the necessary **Attributes and Behaviours** that need to be associated with each object.
3. Identify the **relationships** between these objects.
4. Construct a final comprehensive **Class diagram** showing all objects and their relationships along with their attributes and functions.

```
┌─────────────────────────────────────────────────┐
│                  TaxiCompany                     │
├─────────────────────────────────────────────────┤
│ name: String                                     │
│ taxis: List<Taxi>                                │
├─────────────────────────────────────────────────┤
│ recieveCall(passenger: Passenger): Boolean       │
│ scheduleVehicle(passenger: Passenger): Boolean   │
└─────────────────────────────────────────────────┘
```

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```
┌─────────────────────────────────────────────┐
│                    Taxi                      │
├─────────────────────────────────────────────┤
│ model: String                               │
│ numberPlate: String                         │
│ passengers: List<Passenger>                 │
├─────────────────────────────────────────────┤
│ pickUpPassenger(passenger: Passenger):      │
│ Boolean                                     │
│ dropOffPassenger(): Boolean                 │
│ notifyCompanyForPickup(): Boolean           │
│ notifyCompanyForDropOff(): Boolean          │
└─────────────────────────────────────────────┘
```

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```
┌──────────────────────────────────────┐
│              Passenger               │
├──────────────────────────────────────┤
│ name: String                         │
│ phoneNumber: String                  │
│ pickUpLocation: String               │
├──────────────────────────────────────┤
│ callTaxiCompany(): Boolean           │
└──────────────────────────────────────┘
```