



Daffodil International University  
Faculty of Science & Information Technology  
Department of Information Technology & Management  
Final Examination, Summer 2025  
Course Code: ITM214; Course Title: Object Oriented Concepts  
Sections & Teachers: A, MA

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**Base Class: Vehicle**

- **Attributes:**

- license\_plate (protected)
- vehicle\_type (public)
- base\_rate (private)

- **Constructor:** Initialize all attributes.

- **Methods:**

- displayDetails(): Prints license plate, vehicle type, base rate.
- calculateRentalCost() (Method Overloading):
  - If only days is provided  $\rightarrow \text{total} = \text{days} \times \text{base\_rate}$ .
  - If both days and discount are provided  $\rightarrow \text{total} = (\text{days} \times \text{base\_rate}) - \text{discount}\%$ .

◆ **Derived Class: LuxuryVehicle (inherits from Vehicle)**

- **Additional Attributes:**

- has\_chauffeur (boolean)
- luxury\_features (list, e.g., "Leather Seats", "Premium Audio")

- **Constructor:** Use **constructor chaining** for initialization.
- **Method Overriding:**
  - `displayDetails()`: Show vehicle details + chauffeur info + luxury features.
  - `calculateRentalCost(days, discount=0)`: Before applying calculation, **add an extra 20% luxury fee** to `base_rate`, then proceed with the overloaded logic.

◆ **Task for Students:**

1. Create a `LuxuryVehicle` object with: License Plate: **DHA-2025**, Base Rate: **\$80/day**, Chauffeur: **Yes**, Features: ["Leather Seats", "Premium Audio"].
2. Call `displayDetails()` to print details.
3. Call `calculateRentalCost(5, 10)` to compute cost for **5 days with 10% discount**.