Class Exercise: ER Diagram Design
(Bus Transportation Management System)

Task for Students

Scenario: You are designing a database for a **Bus Transportation Management System** for Dhaka city. The system must store information about buses, routes, drivers, and tickets.

- Each **Bus** has a unique Bus_ID, registration number, and capacity.
- Each **Route** has a unique Route_No and consists of multiple stops (e.g., Motijheel, Gulistan, Farmgate, Mirpur).
- Each **Driver** has a unique Driver_ID, name, and license number.
- Each bus is assigned to exactly one route, but a route can have many buses.
- Each driver can drive multiple buses over time, but only one bus at a time.
- Each **Ticket** includes details such as Ticket_No, fare, and journey date. A ticket is issued for one passenger on one bus for a given route.

Your tasks:

Step 1: Identify all **entities** and their **attributes**.

Step 2: Determine all **relationships** and their cardinalities.

Step 3: Draw an **ER diagram** representing the above information.

Hints for Students

- Look for nouns ($\rightarrow$ entities) and verbs ($\rightarrow$ relationships).
- Decide which relationships are 1:1, 1:N, or M:N.
- Think about relationship attributes — e.g., if a driver drives a bus on a date, the date might belong to the relationship.