Database Design Lab

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Outline

- Entrance Test
- General Problem Statement
- Entities and Relationships
- Entity-Relationship Diagram
- Creating tables
- Tasks 1-4
- Information for Laboratory Reports

General Problem Statement

We need a database for the bus service to the local public school district. Our bus drivers drive a bus on a morning route to pick up students up at each address and take them to school. In the afternoon drivers drive a route that takes students from the school to their homes. We need to keep track of the routes each driver drives and who is on those routes.

What are the entities?

What are the relationships?

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Entities and Relationships

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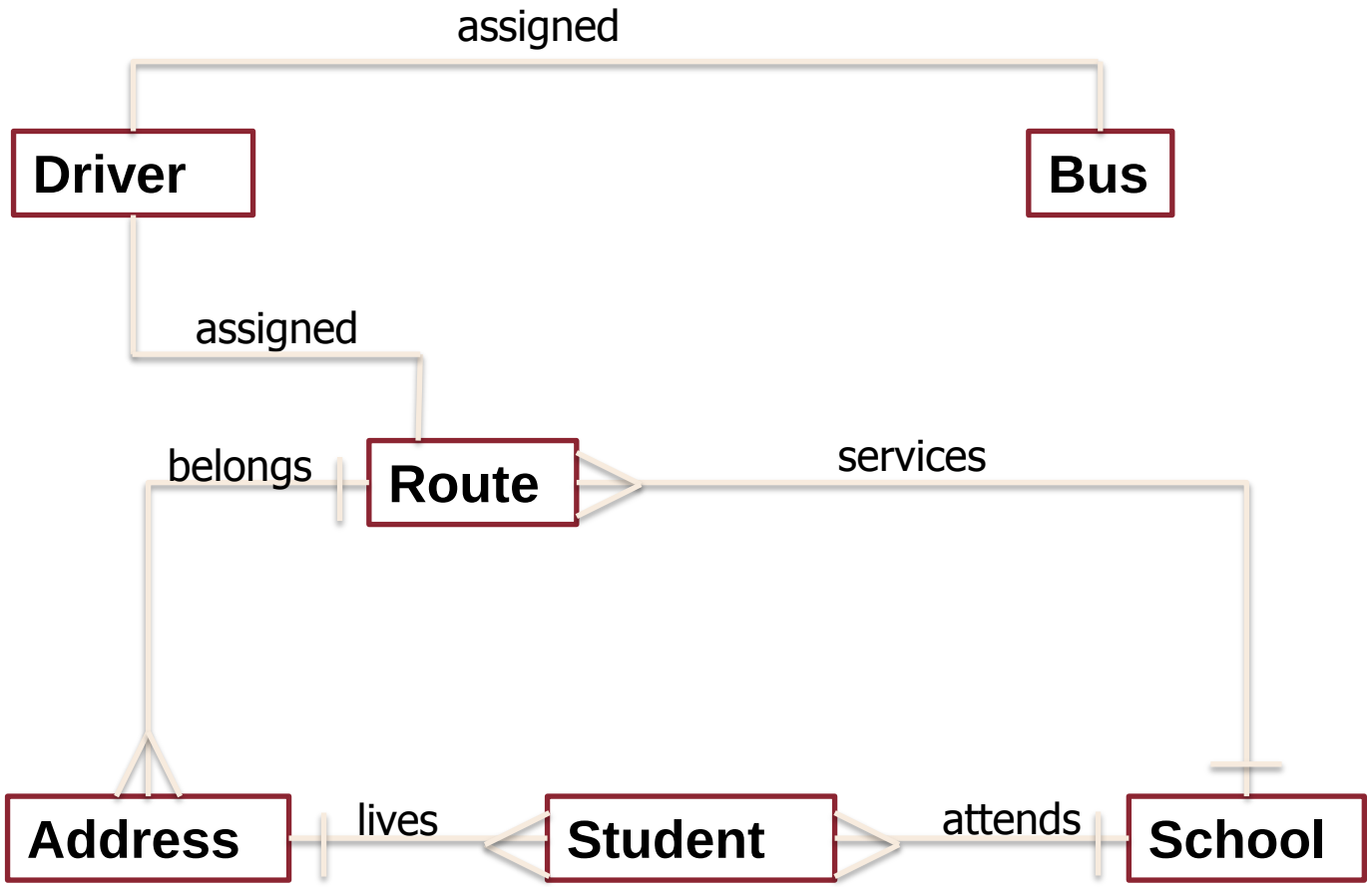
What else do you need to clarify?

Entity-Relation Diagram (first approach)



Further Statements

Each driver is assigned to only one route.

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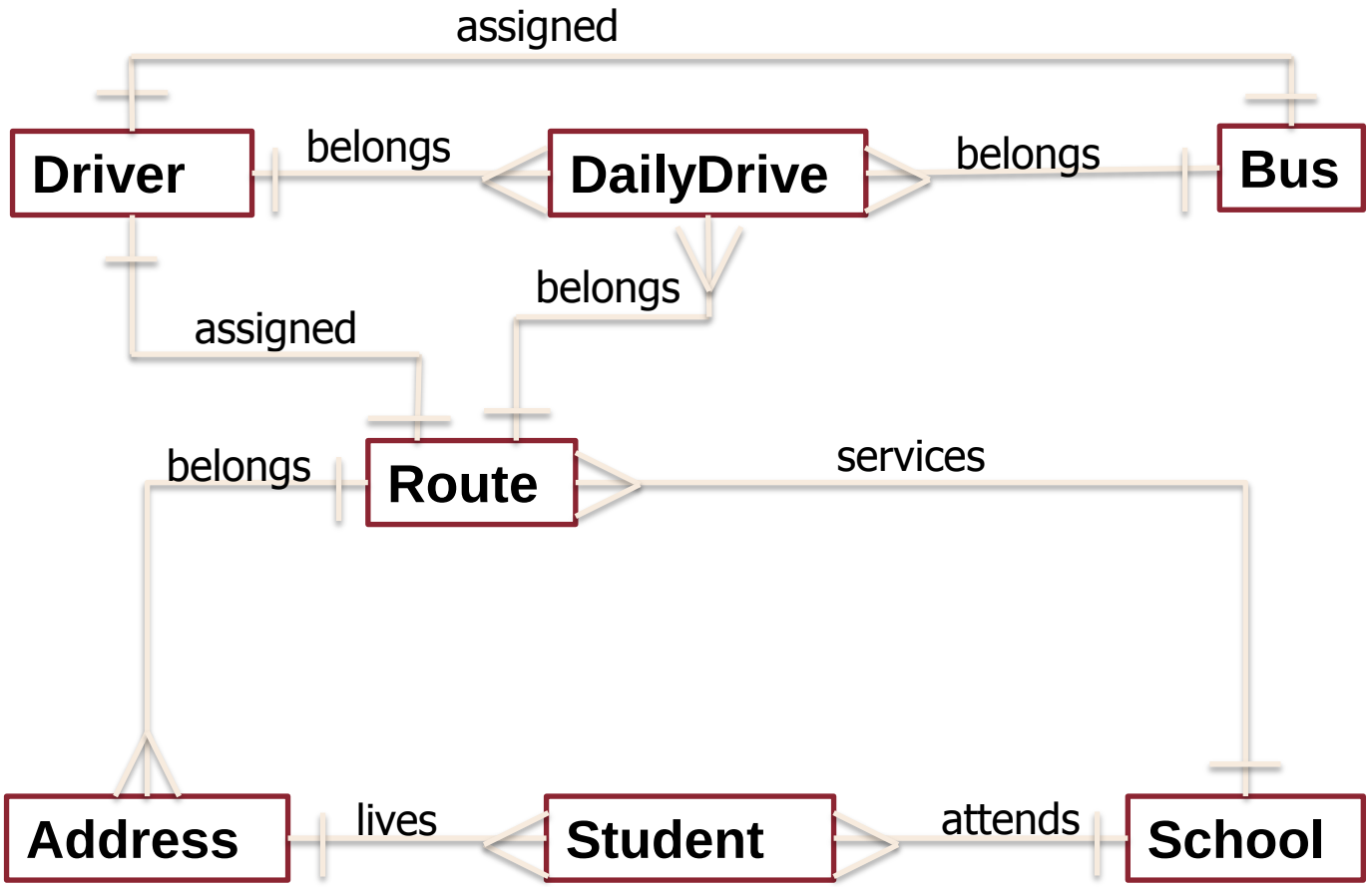
Each driver is usually assigned to only one bus, but might have to use a different one if it is broken.

Entity-Relation Diagram

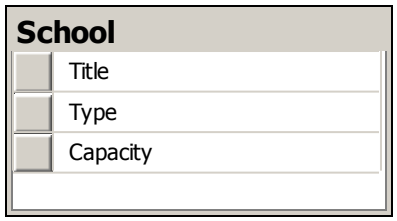


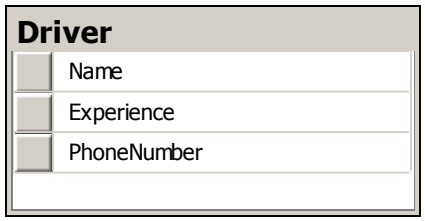
Task 1: Creating Tables

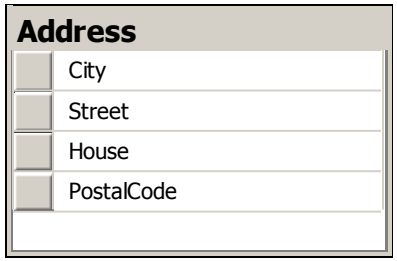
- **Address**
  - City
  - Street
  - House
  - Postal code
- **Bus**
  - License plate
  - Manufacturer
  - Seats
  - Year
- **Driver**
  - Name
  - Experience in years
  - Phone number
- **Route**
  - Priority
  - Financing
- **School**
  - Title
  - Type
  - Capacity
- **Student**
  - Date of birth
  - Full Name
  - Scholarship
- **Daily Drive**

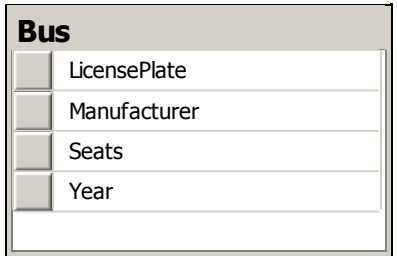
  Connects drivers to buses and to routes on a given date.

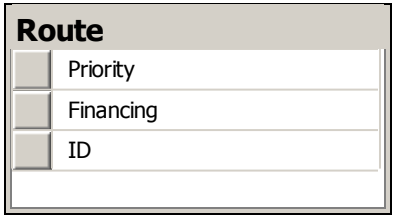
Task 1: Expected Results

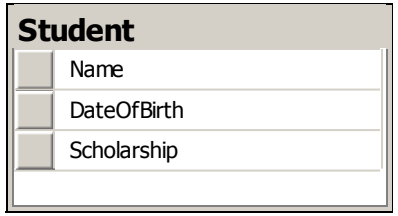








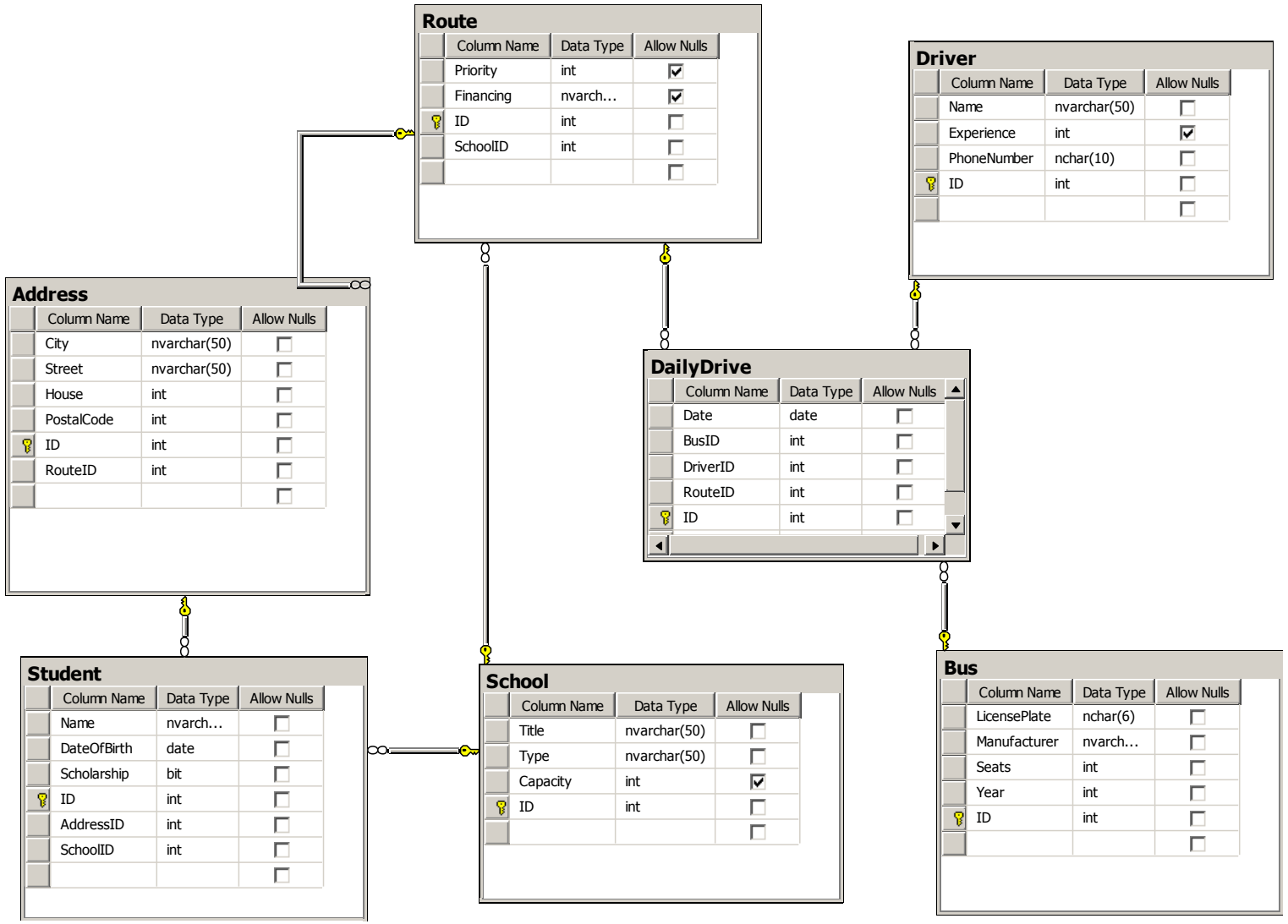




Task 2: Keys, Relationships

- Define keys (unique IDs) for tables.
- Create a **DailyDrive** table (see Entity-Relation diagram)
- Specify relations between tables according to the provided Entity-Relation Diagram
- Check the correctness.

Task 2: Expected Results



Task 3: Add data to tables

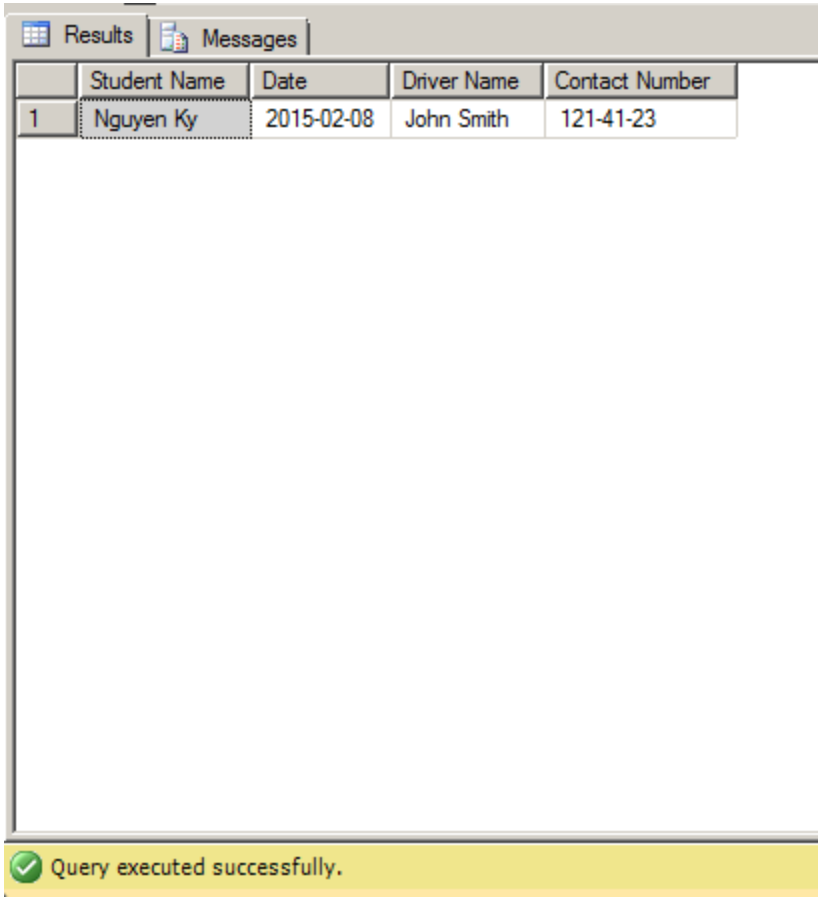
- Add some test data to tables (4-5 rows)
  - Right-click on a table, in pop-up menu click on “Edit top 200 rows”
    - You can insert data line-by-line
  - Use INSERT script:
    - Right-click on a table
    - In pop-up menu select “SCRIPT table AS”
    - Select “INSERT to”
    - Select “New query editor window”
    - Use the generated INSERT statement to insert your data
- For a **DailyDrive** table provide at least 3 different dates with 3 routes, what results in at least 9 lines.

Task 4: Write a simple query

Yesterday, one careless schoolboy forgot his schoolbag in the bus on his way home. The parents want to find out the phone number of the driver that was on the route at boy's address on that day. The parents are sure that this information can be obtained from your database. Write a query to help them.

- They provided you the following data:
  - Name of the schoolboy: *Nguyen Ky*
  - Exact date when he lost his bag: *8 February 2015*

Task 4: Expected Results



Task 5: Modifying database, writing queries

Follow the instructions of the Lab Instructor.

Information for Laboratory Reports

- *Lab title:* “Database Design”
- *Instructor: <instructor’s name>*
- *Department:* Automation & Applied Informatics
- *Lab sequence number:* 1