Supply Chain Management System

Company A is a production company whose factory is located in Kandy. The company has several products and customers (wholesalers, retailers and end customers). The company has a supply chain that uses the railway system to distribute their products to the customers islandwide.

A has negotiated with the railway department and have managed to retain a capacity allocated for them from each transportation train trip and if the orders to be fulfilled with a certain trip exceeds the capacity allocated, then that orders have to be scheduled to the next trip. The train capacity consumption of each item are defined with the items details. Transportation via railway is only limited to few main cities of Colombo, Negombo, Galle, Matara, Jaffna, Trinco and the order goods are stored in a Store near the railway station.

To distribute orders from a store to a delivery address trucks are used. A store in a city has trucks and those trucks are scheduled to deliver the orders. Trucks are driven only through a particular route at a time and the routes are predefined in a way that the whole area related to the particular store is covered with the set of routes. Maximum time taken to complete each route is defined together with the route definition.

A driver and a driver assistant always assigned to a truck schedule and Drivers, Driver assistants and trucks are independent entities. Drivers and Driver assistant assignments are done according to their respective rosters (Driver roster and Driver Assistant roster) and rosters have following constraints.

- A driver should never be assigned to two consecutive Truck schedule and for assistant maximum consecutive turns is two
- Total work hours per driver should not exceed 40 hrs/week and for an assistant it's 60 hrs/week

Customers should place orders at least 7 days prior to the delivery date and customers should be able to select a route that his delivery address is located.

The management of the company requires a comprehensive report system for monitoring and analytics of the platform as well. The reports include:

- Quarterly sales report for a given year
- Items with most orders
- Sales report categorized according to main cities and routes
- Working Hours of Drivers/ Driver Assistants and Used hours of Trucks ● Customer - order report

Task

Your task is to model the database design to encapsulate these requirement. It should consider all entities and relationships given in the description. Moreover you need to identify the places where procedures, functions and triggers can be employed to guarantee ACID properties. Foreign keys and primary keys must be set to maintain consistency. Indexing should be done when necessary.

Additionally, you must get a domain idea by reading related material and take assumptions when not explicitly provided. The database **must be** populated with at least 40 orders of 10 different routes and relevant delivery details must also be included. The train schedule should also be created by yourself defining the capacities. These data insertions can be done manually and no need of UI components just for the task of data input.