Department of Electrical & Computer Engineering
Faculty of Engineering & Architectural Science

Ryerson University

Course Title:	Fundamentals of Data Engineering
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Instructor:	Faezeh Ensan

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Assignment/Lab Title:	Setup and Project Specification

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Project Proposal

The hospitality industry is evolving rapidly, and effective hotel management is crucial for providing exceptional guest experiences. This project aims to develop a robust and efficient database for a Hotel Management System (HMS) that will streamline various hotel operations, enhance customer service, and improve overall efficiency. The proposed database solution will centralize data, automate processes, and provide a scalable foundation for future system enhancements. This database shall contain all the relevant hotel data for the company, including guest information, room inventory, reservations, and billing, building information, statistics data, staff data, etc. From a design standpoint this database can be split into 2 main categories: Sales, Management. Many database entities may be grouped together into larger categories for organizational purposes.

Some of the entities in the management category will be Hotel, Staff, Room, Expenses, Position, Resource. The Hotel entity shall contain attributes such as Name, Address, Postcode, City, Country, NumRooms, DeskPhone, ManagementPhone, StaffCount, Position EstablishmentDate. The Staff entity will have parent attributes and subcategories and child attributes, for example, room service employees shall have a room attribute while the security will not. Some of the parent attributes shall be EmployeeID, HotelCode, FirstName, LastName, DOB, Gender, Email, Phone, Password, Position, Salary. The Room entity can have a RoomNum, RoomType, HotelCode, Occupancy, Services. The Room entity can also be a parent entity with different child entities of different types such as serverRoom, office, cafeteria, etc. Resource entities can have attributes such as Name, Description, Type, Number, Room, and depending on the type it can have attributes such as PartNumber, Owner, Calories, Cost.

Hotels will have a 1 to many relationship with Room, Staff, Positions, Resources, and 0 to many relationship with Expenses. Staff will have a 1 to many relationship with Room, Position, Resource, Expenses.

Some of the entities in the sales category will be Guest, Booking, Bill, Service. Guests can have attributes like GuestID, BookingID, GuestTitle, FirstName, LastName, DOB, Gender, Email, Phone, Password, PassportNo, Address, City, Country. Bookings shall contain BookingID, HotelCode, RoomNo, GuestID, BookingDateTime, Check_inDateTime, Check_outDateTime, NumAdults, NumChildren. Bills can contain InvoiceNum, BookingID, GuestID, RoomCharge, Services, PaymentDate, PaymentMode, ExpireDate, ChequeNo, Employees. The Service entity will have Name, Cost, Employees.

A Guest will have a 1 to many relationship with Booking, Bill and 0 to many relationship with Service and Bill.

This application shall also include a tool to create, read, update and delete bookings. This application will either be a GUI or a CLI based tool and will serve simple administrative functions to be done by employees.

Possible queries:
- Guests that have made a booking at a particular hotel.
- Which service is most popular in the hotel?

- What is the cheapest room I can book?
- What hotel has the widest variety of services?
- Which hotel has the most occupants?
- What positions are at a particular hotel?
- What quantity of a particular resource is held in this room?
- Sort all resources by decreasing cost?
- Most popular food item in the cafeteria?
- Number of children found in a hotel?
- Which guest ordered the most amount of a particular service?
- Room with the largest number of associated employees?