Database Design Report for Hotel Management System — Assignment 02

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Abstract

This report details the database design process for a hotel management system, highlighting the development of ER diagrams and SQL schema. The objective is to make hotel operations and guest experiences good through an effective database system.

Introduction

Advanced database systems have changed hotel management. The work in this assignment develops a comprehensive database to support room booking, inventory control, and staff management.

System Overview

The designed system manages operations across multiple hotel properties, enhancing efficiency in room bookings, staff deployment, and inventory control.

ER Diagrams

Conceptual Model

The conceptual ER diagram provides an overview of the entities and their basic relationships. The diagram is at the end of the doc.

Logical Model

The logical ER diagram details the relationships and attributes. The diagram is at the end of the doc.

Physical Model

The physical ER diagram is tailored for MySQL implementation, specifying data types and constraints. The diagram is at the end of the doc.

Database Schema (SQL Code)

Here is the SQL code generated by Azure Data Studio for implementing the database:

```
-- Create `Guest` table
CREATE TABLE Guest (
    Guest_ID VARCHAR(100) PRIMARY KEY,
    Name VARCHAR(100) NOT NULL,
    Contact_Info VARCHAR(255),
    Preferences VARCHAR(255),
    Past_Reservation_History TEXT,
    Loyalty_Member_Status VARCHAR(50)
);

-- Create `Room` table
```

```sql
CREATE TABLE Room (
    Room_ID VARCHAR(50) PRIMARY KEY,
    Type VARCHAR(50) NOT NULL,
    Occupancy INT NOT NULL,
    Amenities VARCHAR(255)
);

-- Create 'Reservation' table
CREATE TABLE Reservation (
    Reservation_ID VARCHAR(100) PRIMARY KEY,
    Guest_ID VARCHAR(100) NOT NULL,
    Room_ID VARCHAR(50) NOT NULL,
    Check_In_Date DATE NOT NULL,
    Check_Out_Date DATE NOT NULL,
    Special_Requests VARCHAR(255),
    FOREIGN KEY (Guest_ID) REFERENCES Guest(Guest_ID),
    FOREIGN KEY (Room_ID) REFERENCES Room(Room_ID)
);

-- Create 'Staff' table
CREATE TABLE Staff (
    Staff_ID VARCHAR(100) PRIMARY KEY,
    Name VARCHAR(100) NOT NULL,
    Contact_Details VARCHAR(255) NOT NULL,
    Job_Title VARCHAR(100) NOT NULL,
    Work_Schedule VARCHAR(100)
);

-- Create 'Role' table
CREATE TABLE Role (
    Role_ID VARCHAR(100) PRIMARY KEY,
    Description VARCHAR(255) NOT NULL
);

-- Create 'Task' table
CREATE TABLE Task (
    Task_ID VARCHAR(100) PRIMARY KEY,
    Description VARCHAR(255) NOT NULL
);

-- Create 'Inventory' table
CREATE TABLE Inventory (
    Inventory_ID VARCHAR(100) PRIMARY KEY,
    Item_Description VARCHAR(255) NOT NULL,
    Stock_Level INT NOT NULL,
    FOREIGN KEY (Supplier_ID) REFERENCES Supplier(Supplier_ID)
);

-- Create 'Supplier' table
CREATE TABLE Supplier (
    Supplier_ID VARCHAR(100) PRIMARY KEY,
    Contact_Details VARCHAR(255) NOT NULL
);

-- Create 'Feedback' table
CREATE TABLE Feedback (
    Feedback_ID VARCHAR(100) PRIMARY KEY,
    Comments TEXT,
    Rating VARCHAR(50),
    Guest_ID VARCHAR(100) NOT NULL,
```

```
    FOREIGN KEY (Guest_ID) REFERENCES Guest(Guest_ID)
);

-- Create 'Payment' table
CREATE TABLE Payment (
    Payment_ID VARCHAR(100) PRIMARY KEY,
    Reservation_ID VARCHAR(100) NOT NULL,
    Amount VARCHAR(100) NOT NULL,
    Method VARCHAR(50) NOT NULL,
    FOREIGN KEY (Reservation_ID) REFERENCES Reservation(Reservation_ID)
);
```
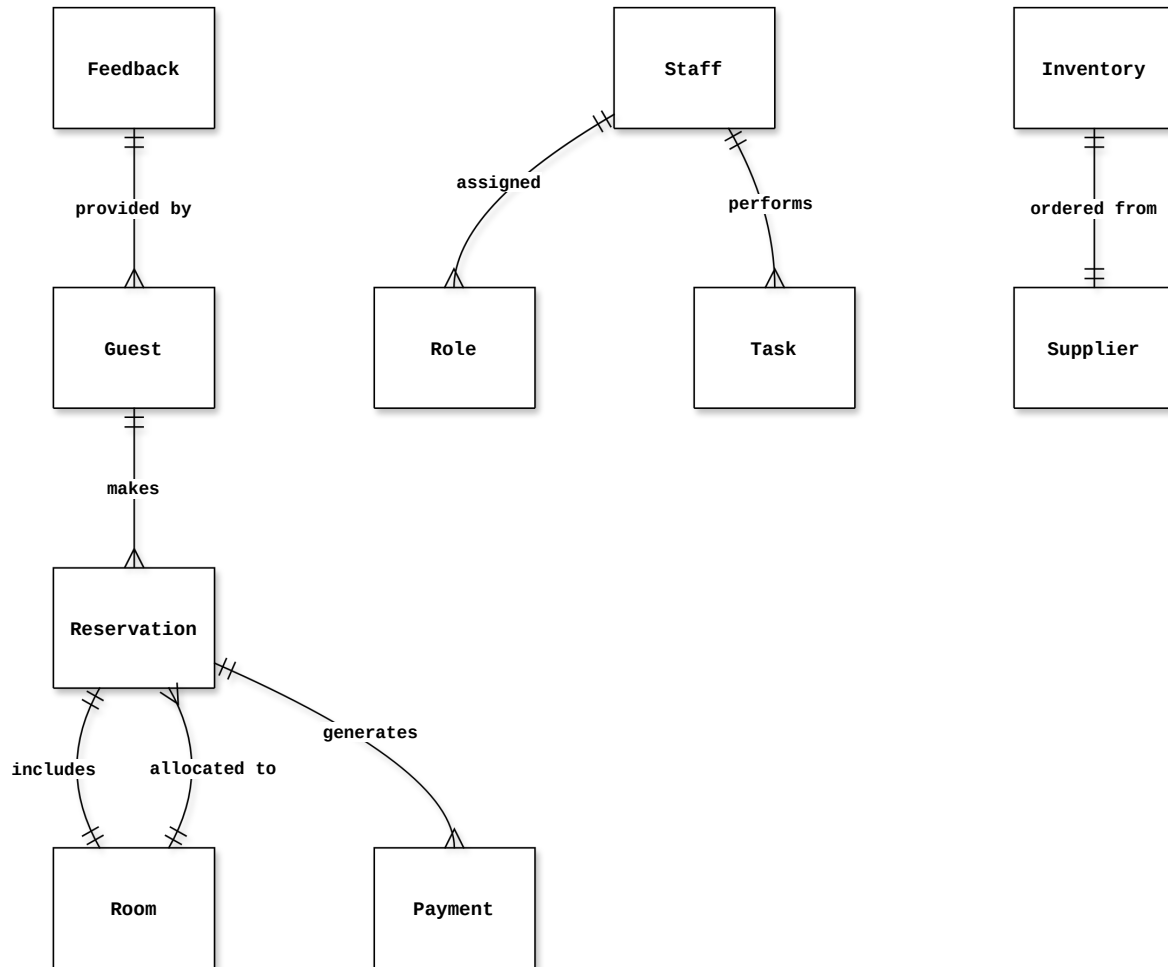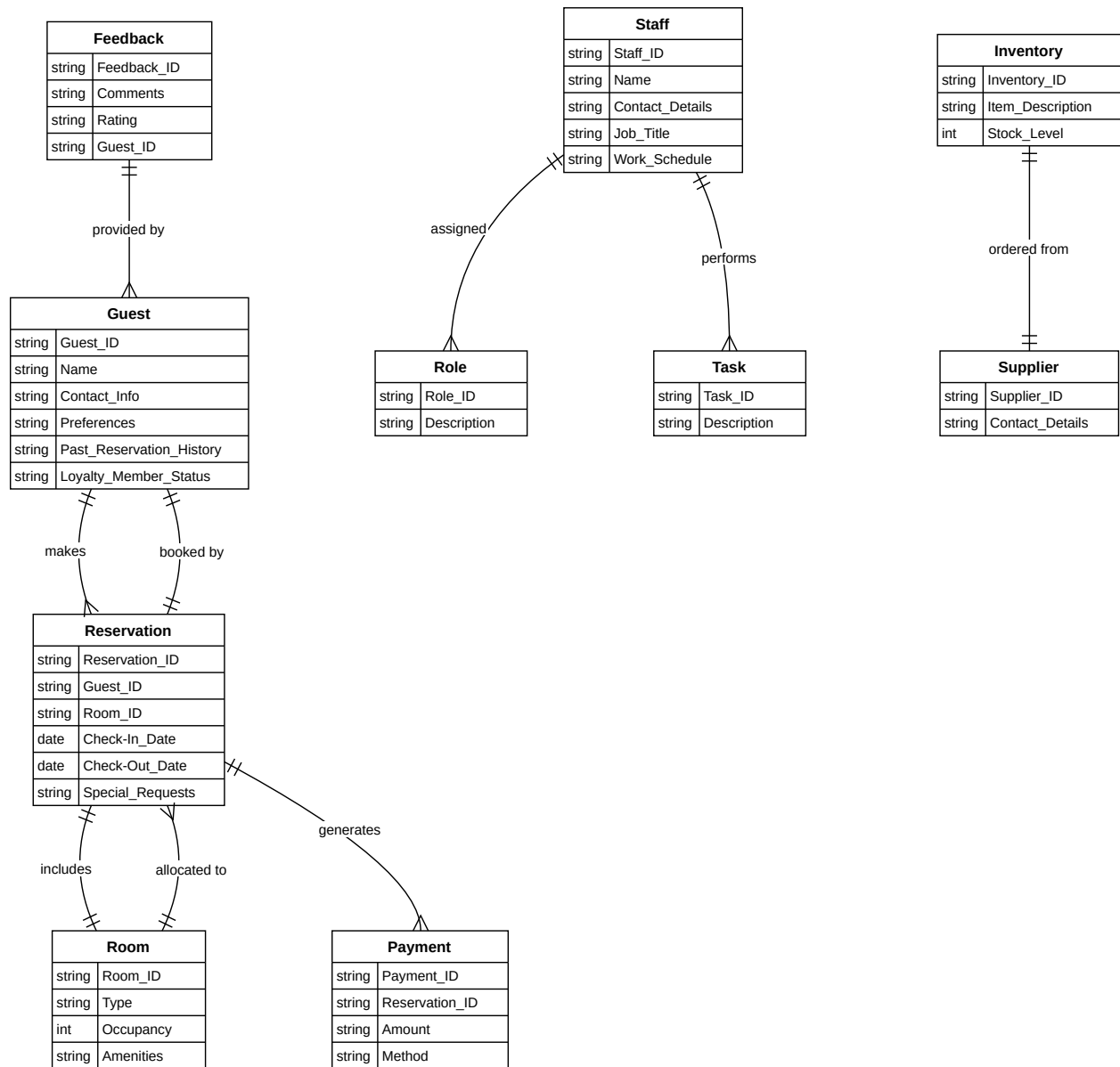

Figure 1: Conceptual ER Diagram

Feedback

string	Feedback_ID
string	Comments
string	Rating
string	Guest_ID

Staff

string	Staff_ID
string	Name
string	Contact_Details
string	Job_Title
string	Work_Schedule

Inventory

string	Inventory_ID
string	Item_Description
int	Stock_Level

provided by

assigned

performs

ordered from

Guest

string	Guest_ID
string	Name
string	Contact_Info
string	Preferences
string	Past_Reservation_History
string	Loyalty_Member_Status

Role

string	Role_ID
string	Description

Task

string	Task_ID
string	Description

Supplier

string	Supplier_ID
string	Contact_Details

makes

booked by

Reservation

string	Reservation_ID
string	Guest_ID
string	Room_ID
date	Check-In_Date
date	Check-Out_Date
string	Special_Requests

generates

includes

allocated to

Room

string	Room_ID
string	Type
int	Occupancy
string	Amenities

Payment

string	Payment_ID
string	Reservation_ID
string	Amount
string	Method

Figure 2: Logical ER Diagram

Tool Selection

I chose Amazon RDS with AWS codecatalyst tool over MySQL Workbench for its online tool nature. It provides syntax support for all database languages and works with any notation of an ERD, making our development workflow easy, regardless of the tediousness of tool installation.
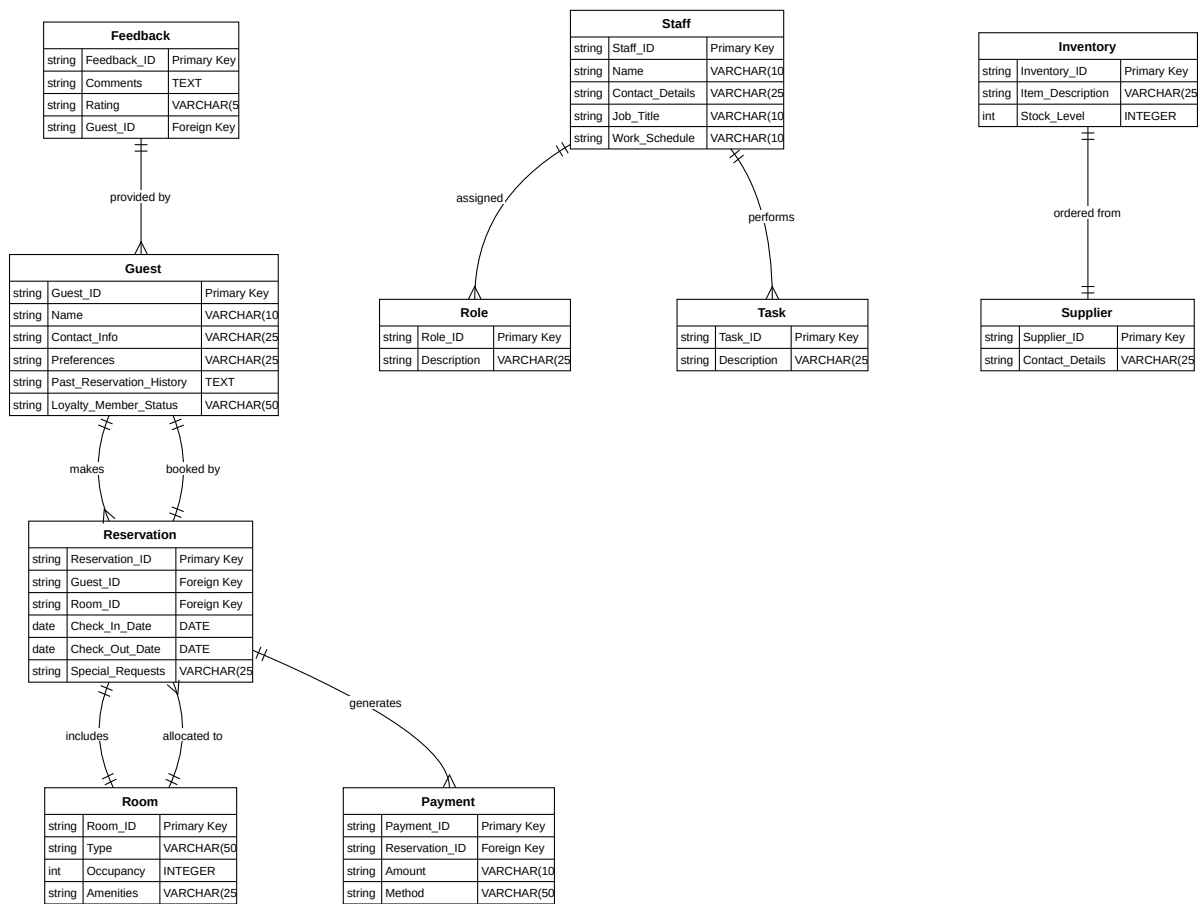
Figure 3: Physical ER Diagram