test query:

**Get all booked rooms with customer details:**

SELECT B."Date", B."Hotel\_Num", B."Room\_Num", P."Name" AS Customer\_Name

FROM "Book" B

JOIN "Customer" C ON B."Customer\_ID" = C."ID"

JOIN "Person" P ON C."ID" = P."ID";

**Count available rooms in each hotel**

SELECT "Hotel\_Num", COUNT(\*) AS Available\_Rooms

FROM "Room"

WHERE "Booked" = FALSE

GROUP BY "Hotel\_Num";

**Get hotels with the highest number of booked rooms**

SELECT H."Hotel\_Num", H."Address", COUNT(B."Room\_Num") AS Total\_Booked

FROM "Hotel" H

JOIN "Book" B ON H."Hotel\_Num" = B."Hotel\_Num"

GROUP BY H."Hotel\_Num"

ORDER BY Total\_Booked DESC;

**Nested Query: Find hotels where all rooms are occupied**

SELECT H."Hotel\_Num", H."Address"

FROM "Hotel" H

WHERE NOT EXISTS (

SELECT 1 FROM "Room" R

WHERE R."Hotel\_Num" = H."Hotel\_Num"

AND R."Occupied" = FALSE

);

**View: Get the number of available rooms per area**

CREATE VIEW Available\_Rooms\_Per\_Area AS

SELECT H."Address", COUNT(R."Room\_Num") AS Available\_Rooms

FROM "Hotel" H

JOIN "Room" R ON H."Hotel\_Num" = R."Hotel\_Num"

WHERE R."Booked" = FALSE

GROUP BY H."Address";

Query to create table structures:

**-- Hotel Chain Table**

CREATE TABLE "Hotel\_Chain" (

"Chain\_Name" VARCHAR(255) PRIMARY KEY,

"Num\_Hotels" INT CHECK ("Num\_Hotels" > 0),

"Emails" VARCHAR(255) NOT NULL,

"Address" TEXT,

"Phone" VARCHAR(20) NOT NULL CHECK ("Phone" ~ '^[0-9+-]+$')

);

**-- Hotel Table**

CREATE TABLE "Hotel" (

"Hotel\_Num" INT PRIMARY KEY,

"Email" TEXT,

"Phone" TEXT,

"Stars" INT CHECK ("Stars" BETWEEN 1 AND 5),

"Num\_Rooms" INT CHECK ("Num\_Rooms" > 0),

"Address" TEXT

);

**-- Owns Table**

CREATE TABLE "Owns" (

"Chain\_Name" VARCHAR(255),

"Hotel\_Num" INT,

PRIMARY KEY ("Chain\_Name", "Hotel\_Num"),

FOREIGN KEY ("Chain\_Name") REFERENCES "Hotel\_Chain"("Chain\_Name") ON DELETE CASCADE,

FOREIGN KEY ("Hotel\_Num") REFERENCES "Hotel"("Hotel\_Num") ON DELETE CASCADE

);

**-- Person Table (Superclass)**

CREATE TABLE "Person" (

"ID" VARCHAR(20) PRIMARY KEY CHECK ("ID" ~ '^[A-Z0-9-]+$'),

"Name" VARCHAR(100) NOT NULL,

"Address" VARCHAR(255) NOT NULL,

"ID\_Type" VARCHAR(50) CHECK ("ID\_Type" IN ('SSN', 'SIN', 'Driving License'))

);

**-- Customer Table**

CREATE TABLE "Customer" (

"ID" VARCHAR(20) PRIMARY KEY REFERENCES "Person"("ID"),

"Register\_Date" DATE DEFAULT CURRENT\_DATE CHECK ("Register\_Date" <= CURRENT\_DATE)

);

**-- Employee Table**

CREATE TABLE "Employee" (

"ID" VARCHAR(20) PRIMARY KEY REFERENCES "Person"("ID"),

"Name" VARCHAR(100) NOT NULL,

"Address" VARCHAR(255) NOT NULL,

"Role" VARCHAR(100)

);

**-- Manager Table**

CREATE TABLE "Manager" (

"ID" VARCHAR(20) PRIMARY KEY REFERENCES "Employee"("ID"),

"Name" VARCHAR(100) NOT NULL,

"Address" VARCHAR(255) NOT NULL,

"Hotel\_Num" INT REFERENCES "Hotel"("Hotel\_Num")

);

**-- Damage Table**

CREATE TABLE "Damage" (

"Damage\_ID" SERIAL PRIMARY KEY,

"Description" TEXT

);

**-- Room Table**

CREATE TABLE "Room" (

"Hotel\_Num" INT,

"Room\_Num" INT,

"Booked" BOOLEAN DEFAULT FALSE,

"Occupied" BOOLEAN DEFAULT FALSE,

"Price" DECIMAL(10,2) CHECK ("Price" > 0),

"Amenities" TEXT,

"Capacity" INT CHECK ("Capacity" > 0),

"View" TEXT CHECK ("View" IN ('sea', 'mountain', 'other')),

"Extend" BOOLEAN DEFAULT TRUE,

"Damage" INT REFERENCES "Damage"("Damage\_ID"),

PRIMARY KEY ("Hotel\_Num", "Room\_Num"),

FOREIGN KEY ("Hotel\_Num") REFERENCES "Hotel"("Hotel\_Num") ON DELETE CASCADE,

CHECK (NOT ("Booked" = FALSE AND "Occupied" = TRUE)) -- Prevent logical inconsistency

);

**-- Archive Table**

CREATE TABLE "Archive" (

"Arch\_No" SERIAL PRIMARY KEY,

"Date" DATE

);

**-- CheckIn Table**

CREATE TABLE "CheckIn" (

"Customer\_ID" VARCHAR(20),

"Arch\_No" INT,

"Employee\_ID" VARCHAR(20),

"Hotel\_Num" INT,

"Room\_Num" INT,

"Date" DATE,

PRIMARY KEY ("Customer\_ID", "Room\_Num", "Arch\_No"),

FOREIGN KEY ("Customer\_ID") REFERENCES "Customer"("ID"),

FOREIGN KEY ("Arch\_No") REFERENCES "Archive"("Arch\_No") ON DELETE CASCADE,

FOREIGN KEY ("Employee\_ID") REFERENCES "Employee"("ID"),

FOREIGN KEY ("Hotel\_Num", "Room\_Num") REFERENCES "Room"("Hotel\_Num", "Room\_Num"),

CHECK ("Customer\_ID" <> "Employee\_ID") -- Prevents employee from checking in themselves

);

**-- Book Table**

CREATE TABLE "Book" (

"Arch\_No" INT,

"Hotel\_Num" INT,

"Room\_Num" INT,

"Customer\_ID" VARCHAR(20),

"Date" DATE,

PRIMARY KEY ("Arch\_No", "Room\_Num", "Customer\_ID"),

FOREIGN KEY ("Arch\_No") REFERENCES "Archive"("Arch\_No") ON DELETE CASCADE,

FOREIGN KEY ("Customer\_ID") REFERENCES "Customer"("ID"),

FOREIGN KEY ("Hotel\_Num", "Room\_Num") REFERENCES "Room"("Hotel\_Num", "Room\_Num")

);