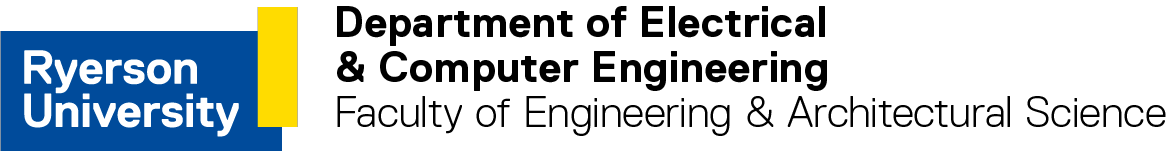
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| **Course Title:** | Fundamentals of Data Engineering |
| --- | --- |
| **Course Number:** | COE 848 |
| **Semester/Year (e.g.F2016):** | W2024 |

| **Instructor:** | Faezeh Ensan |
| --- | --- |

| *Assignment/Lab Number:* | 4 |
| --- | --- |
| *Assignment/Lab Title:* | Database Design |

| *Submission Date:* | Mar 11, 2024 |
| --- | --- |
| *Due Date:* | Mar 11, 2024 |

| **Student**  **LAST Name** | **Student**  **FIRST Name** | **Student**  **Number** | **Section** | **Signature \*** |
| --- | --- | --- | --- | --- |
| Abdur-Rahman | Taskin | 500973553 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |



# Entity Relationship Diagram

### SQlite Dump

PRAGMA foreign\_keys=OFF;

BEGIN TRANSACTION;

CREATE TABLE Hotel (

HotelCode *INTEGER* PRIMARY KEY,

Name *TEXT*,

Address *TEXT*,

Postcode *TEXT*,

City *TEXT*,

Country *TEXT*,

NumRooms *INTEGER*,

DeskPhone *TEXT*,

ManagementPhone *TEXT*,

StaffCount *INTEGER*,

EstablishmentDate *DATE*

);

INSERT INTO Hotel VALUES(1,'Germantown Hotel','4944 Germantown Ave, Philadelphia, Pennsylvania, United States','PA 19144','Philadelphia','USA',345,'+12673686167',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(2,'Weston Hotel','874-A Weston Rd, York, ON','M6N 3R6','York','Canada',455,'+14162435320',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(3,'Scarborough Hotel','41 Lebovic Ave Unit A110, Scarborough, ON','M1L 0H2','Scarborough','Canada',277,'+14162859973',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(4,'Ottawa Hotel','1172 Walkley Rd, Ottawa, ON','K1V 2P7','Ottawa','Canada',510,'+16135239600',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(5,'London Hotel','2 Whitehall Ct, London, United Kingdom','SW1A 2EJ','London','United Kingdom',332,'+442075235062',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(6,'Birmingham Hotel','4 Woodcock St, Birmingham, United Kingdom','B7 4BL','Birmingham','United Kingdom',510,'+441218206000',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(7,'Leicester Hotel','19 Loughborough Rd, Leicester, United Kingdom','LE4 5LJ','Leicester','United Kingdom',82,'+441162682626',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(8,'Makkah Hotel','4289, Al Hajlah, Makkah, Saudi Arabia','24231','Makkah','Saudi Arabia',602,'+966125768888',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(9,'Riyadh Hotel','JPRC+PF3, Omar Almukhtar St, Al Amal, Riyadh, Saudi Arabia','11561','Riyadh','Saudi Arabia',188,'+966114024121',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(10,'Kuwait City Hotel','Mutlaq Abbas Munawir St, Kuwait City, Kuwait','','Kuwait City','Kuwait',734,'+96522262000',NULL,NULL,NULL);

INSERT INTO Hotel VALUES(11,'Sharjah Hotel','Al Mahatta - Al Qasimia - Sharjah - United Arab Emirates','89XR+V9XAl','Sharjah','United Arab Emirates',221,'+97165066222',NULL,NULL,NULL);

CREATE TABLE Staff (

StaffID *INTEGER* PRIMARY KEY,

HotelCode *INTEGER*,

FirstName *TEXT*,

LastName *TEXT*,

DOB *DATE*,

Gender *TEXT*,

Email *TEXT*,

Phone *TEXT*,

Password *TEXT*,

Position *TEXT*,

Salary *REAL*,

FOREIGN KEY (HotelCode) REFERENCES Hotel (HotelCode)

);

INSERT INTO Staff VALUES(1,1,'Bethan','Ramirez',NULL,'M','bramirez@hotel.com',NULL,'$2b$12$r7b.2pj7WfBm3JiHGQsQr.J96CRNoLUafwtCXdLiBW/diI64fCI.C',NULL,NULL);

INSERT INTO Staff VALUES(2,1,'Eoin','Colon',NULL,'M','eoin.colon@hotel.com',NULL,'$2b$12$DnLwxMa21nv5tIl/dldz7uUpLfWzPqYN4fk3ZmGTfU23yXTzOMVP6',NULL,NULL);

INSERT INTO Staff VALUES(3,1,'Pablo','Rivers',NULL,'M','pablo.rivers@hotel.com',NULL,'$2b$12$nyrSDwO1cSMd8VEt4tRhSe71u1mi7zSkFQMMTg/u4gILCFupDwYF6',NULL,NULL);

INSERT INTO Staff VALUES(4,1,'Richard','Gilmore',NULL,'M','richard.gilmore@hotel.com',NULL,'$2b$12$iMtAxDvhkThUugFNAs1erunaBi416zrb0IajY0tBp4e2VinNN3g1S',NULL,NULL);

INSERT INTO Staff VALUES(5,1,'Zahraa','Woodward',NULL,'F','zwoodward@hotel.com',NULL,'$2b$12$hQCcjv31Gantt.i4DzGLGOOkIMhEf8mo.SkLBjV3PFb4KSi9J2euu',NULL,NULL);

INSERT INTO Staff VALUES(6,1,'Abigail','Rivera',NULL,'F','abigail.rivera@hotel.com',NULL,'$2b$12$QnAMdbcx5YBotDfOcXZj8ujhVLwN4KTezSAmphfHTBuGLOZYnrLXG',NULL,NULL);

INSERT INTO Staff VALUES(7,2,'Marco','Clements',NULL,'M','mclements@hotel.com',NULL,'$2b$12$Drs/KX6XP/WIHTBfgazkeO5nqvKIbb/QzwS6IdZnKKydpcHRO9VSq',NULL,NULL);

INSERT INTO Staff VALUES(8,2,'Teresa','Zamora',NULL,'F','tzamora@hotel.com',NULL,'$2b$12$z1OBIUpcXbq.Y3Gs3j1oSOlwaquX1iAvbWf5koa4wjLEyRudRDJxK',NULL,NULL);

INSERT INTO Staff VALUES(9,2,'Leanne','Davies',NULL,'F','ldavies@hotel.com',NULL,'$2b$12$7N8.hEbaVha8da/lKOld6uLpPkal9biNj1Uqent8.1LwrTr345v1W',NULL,NULL);

INSERT INTO Staff VALUES(10,3,'Shakira','Luna',NULL,'F','shakira.luna@hotel.com',NULL,'$2b$12$iigjxuH.sGRfrtEI5xO3iepEYEk3r0gk1DtGtlSmeCMx3dcmZrWI.',NULL,NULL);

CREATE TABLE Room (

RoomNo *INT* NOT NULL,

HotelCode *INTEGER* NOT NULL,

RoomType *TEXT*, PricePerNight *REAL*, NumBeds *INTEGER*,

PRIMARY KEY (HotelCode, RoomNo)

FOREIGN KEY (HotelCode) REFERENCES Hotel (HotelCode)

);

INSERT INTO Room VALUES(1,1,'Guest',81.999999999999999998,1);

INSERT INTO Room VALUES(2,1,'Guest',145.0,2);

INSERT INTO Room VALUES(3,1,'Guest',81.999999999999999998,1);

INSERT INTO Room VALUES(4,1,'Office',81.999999999999999998,1);

INSERT INTO Room VALUES(5,1,'Public',81.999999999999999998,1);

INSERT INTO Room VALUES(1,2,'Guest',81.999999999999999998,1);

INSERT INTO Room VALUES(2,2,'Guest',145.0,2);

INSERT INTO Room VALUES(3,2,'Guest',81.999999999999999998,1);

INSERT INTO Room VALUES(4,2,'Office',81.999999999999999998,1);

INSERT INTO Room VALUES(5,2,'Public',81.999999999999999998,1);

CREATE TABLE Guest (

GuestID *INTEGER* PRIMARY KEY,

FirstName *TEXT* NOT NULL,

LastName *TEXT* NOT NULL,

DOB *DATE*,

Gender *TEXT*,

Email *TEXT* NOT NULL,

Password *TEXT* NOT NULL,

Address *TEXT*,

Phone *TEXT*

);

INSERT INTO Guest VALUES(1,'Irene','Miles',NULL,'F','irene.miles@gmail.com','irenemiles',NULL,NULL);

INSERT INTO Guest VALUES(2,'Phoebe','Mayer',NULL,'F','phoebe.mayer@gmail.com','phoebemayer',NULL,NULL);

INSERT INTO Guest VALUES(3,'Cara','Leblanc',NULL,'F','cara.leblanc@gmail.com','caraleblanc',NULL,NULL);

INSERT INTO Guest VALUES(4,'Bonnie','Webb',NULL,'F','bonnie.webb@gmail.com','bonniewebb',NULL,NULL);

INSERT INTO Guest VALUES(5,'Earle','Khan',NULL,'M','earle.khan@gmail.com','earlekhan',NULL,NULL);

INSERT INTO Guest VALUES(6,'Ruben','Reeves',NULL,'M','ruben.reeves@gmail.com','rubenreeves',NULL,NULL);

INSERT INTO Guest VALUES(7,'Brian','Black',NULL,'M','brian.black@gmail.com','brianblack',NULL,NULL);

INSERT INTO Guest VALUES(8,'Antoinette','Trujillo',NULL,'F','antoinette.trujillo@gmail.com','antoinettetrujillo',NULL,NULL);

INSERT INTO Guest VALUES(9,'Kristina','Clements',NULL,'F','kristina.clements@gmail.com','kristinaclements',NULL,NULL);

INSERT INTO Guest VALUES(10,'David','Oconner',NULL,'M','david.oconner@gmail.com','davidoconner',NULL,NULL);

CREATE TABLE Resource (

ResourceID *INTEGER* PRIMARY KEY,

HotelCode *INTEGER* NOT NULL,

Name *TEXT* NOT NULL,

Quantity *TEXT*,

FOREIGN KEY (HotelCode) REFERENCES Hotel (HotelCode)

);

INSERT INTO Resource VALUES(1,1,'Bread','4');

INSERT INTO Resource VALUES(2,1,'Coffee','20');

INSERT INTO Resource VALUES(3,1,'Egg','120');

INSERT INTO Resource VALUES(4,1,'Lettuce','50');

INSERT INTO Resource VALUES(5,1,'Hand-soap','34');

INSERT INTO Resource VALUES(6,1,'Dish-soap','22');

INSERT INTO Resource VALUES(7,2,'Vacuum','12');

INSERT INTO Resource VALUES(8,2,'Pillow','40');

INSERT INTO Resource VALUES(9,3,'Bed-sheet','14');

INSERT INTO Resource VALUES(10,3,'Walkie-Talkie','15');

CREATE TABLE Expense (

ExpenseID *INTEGER* PRIMARY KEY,

HotelCode *INTEGER* NOT NULL,

Name *TEXT* NOT NULL,

Amount *REAL* NOT NULL,

FOREIGN KEY (HotelCode) REFERENCES Hotel (HotelCode)

);

INSERT INTO Expense VALUES(1,1,'Resupply bread',50.0);

INSERT INTO Expense VALUES(2,1,'Resupply coffee',60.0);

INSERT INTO Expense VALUES(3,1,'Guest speaker event',150.0);

INSERT INTO Expense VALUES(4,2,'Resupply broom',24.0);

INSERT INTO Expense VALUES(5,2,'Resupply towel',70.0);

INSERT INTO Expense VALUES(6,2,'Resupply carrot',45.0);

INSERT INTO Expense VALUES(7,3,'Resupply bed sheet',76.999999999999999998);

INSERT INTO Expense VALUES(8,3,'Resupply back-up keys',12.0);

INSERT INTO Expense VALUES(9,3,'Resupply back-up monitors',400.0);

INSERT INTO Expense VALUES(10,3,'Cisco network testing service',120.0);

CREATE TABLE Booking (

BookingID *INTEGER* PRIMARY KEY,

HotelCode *INTEGER* NOT NULL,

RoomNo *INTEGER* NOT NULL,

GuestID *INTEGER* NOT NULL,

BookingDateTime DATETIME NOT NULL,

CheckinDateTime DATETIME NOT NULL,

CheckoutDateTime DATETIME NOT NULL,

NumAdults *INTEGER* NOT NULL,

FOREIGN KEY (HotelCode) REFERENCES Hotel (HotelCode),

FOREIGN KEY (RoomNo) REFERENCES Room (RoomNo),

FOREIGN KEY (GuestID) REFERENCES Guest (GuestID)

);

INSERT INTO Booking VALUES(1,1,2,3,'2024-04-10 12:00:00','2024-05-01 14:00:00','2024-05-05 10:00:00',2);

INSERT INTO Booking VALUES(2,1,1,1,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-08 16:30:22',1);

INSERT INTO Booking VALUES(3,1,2,2,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-09 16:30:22',2);

INSERT INTO Booking VALUES(4,1,3,3,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-10 16:30:22',1);

INSERT INTO Booking VALUES(5,1,4,4,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-11 16:30:22',1);

INSERT INTO Booking VALUES(6,1,5,5,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-12 16:30:22',1);

INSERT INTO Booking VALUES(7,2,1,6,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-13 16:30:22',2);

INSERT INTO Booking VALUES(8,2,2,7,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-14 16:30:22',1);

INSERT INTO Booking VALUES(9,2,3,8,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-15 16:30:22',1);

INSERT INTO Booking VALUES(10,2,4,9,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-16 16:30:22',2);

INSERT INTO Booking VALUES(11,2,5,10,'2024-03-06 16:30:22','2024-03-06 16:30:22','2024-03-17 16:30:22',1);

CREATE TABLE Bill (

InvoiceNum *INTEGER* PRIMARY KEY,

BookingID *INTEGER* NOT NULL,

Amount *REAL* NOT NULL,

PaidDate *DATE*,

PaymentMode *TEXT*,

ExpireDate *DATE* NOT NULL,

FOREIGN KEY (BookingID) REFERENCES Booking (BookingID)

);

INSERT INTO Bill VALUES(1,1,100.0,'2024-04-10','Debit','2024-04-15');

INSERT INTO Bill VALUES(2,2,150.0,'2024-04-10','Debit','2024-04-15');

INSERT INTO Bill VALUES(3,3,120.0,'2024-04-12','Debit','2024-04-17');

INSERT INTO Bill VALUES(4,4,80.0,'2024-04-10','Debit','2024-04-15');

INSERT INTO Bill VALUES(5,5,200.0,'2024-04-10','Debit','2024-04-15');

INSERT INTO Bill VALUES(6,6,179.99999999999999999,'2024-04-12','Debit','2024-04-17');

INSERT INTO Bill VALUES(7,7,90.0,'2024-04-10','Debit','2024-04-15');

INSERT INTO Bill VALUES(8,8,110.0,'2024-04-10','Debit','2024-04-15');

INSERT INTO Bill VALUES(9,9,129.99999999999999999,'2024-04-12','Debit','2024-04-17');

INSERT INTO Bill VALUES(10,10,95.0,'2024-04-12','Debit','2024-04-17');

CREATE TABLE Service (

ID *INTEGER* PRIMARY KEY,

BillNum *INTEGER* NOT NULL,

Name *TEXT* NOT NULL,

Cost *REAL*,

Description *TEXT*,

FOREIGN KEY (BillNum) REFERENCES Bill (InvoiceNum)

);

INSERT INTO Service VALUES(1,1,'Room Service',25.0,'Food and drinks delivered to the room');

INSERT INTO Service VALUES(2,1,'WiFi Access',10.0,'High-speed internet access');

INSERT INTO Service VALUES(3,2,'Room Service',20.0,'Food and drinks delivered to the room');

INSERT INTO Service VALUES(4,3,'Laundry',15.0,'Cleaning and ironing of clothes');

INSERT INTO Service VALUES(5,3,'Room Service',30.0,'Food and drinks delivered to the room');

INSERT INTO Service VALUES(6,4,'WiFi Access',12.0,'High-speed internet access');

INSERT INTO Service VALUES(7,5,'Laundry',17.999999999999999999,'Cleaning and ironing of clothes');

INSERT INTO Service VALUES(8,6,'Room Service',22.0,'Food and drinks delivered to the room');

INSERT INTO Service VALUES(9,7,'WiFi Access',8.0,'High-speed internet access');

INSERT INTO Service VALUES(10,8,'Laundry',20.0,'Cleaning and ironing of clothes');

COMMIT;

### Queries

1. Return all guest who made a booking at a given hotel

SELECT DISTINCT G.FirstName, G.LastName

FROM Guest G

JOIN Booking B ON G.GuestID = B.GuestID

JOIN Hotel H ON B.HotelCode = H.HotelCode

WHERE H.Name = ?;

1. Return all RoomNo given a upper price limit for a given hotel.

SELECT R.RoomNo, R.PricePerNight

FROM Room R

JOIN Hotel H ON R.HotelCode = H.HotelCode

WHERE H.Name = ? AND R.PricePerNight < ?;

1. Return all hotels ordered by most occupants to least.

SELECT H.HotelCode, H.Name, SUM(B.NumAdults) as TotalOccupants

FROM Hotel H

LEFT JOIN Booking B ON H.HotelCode = B.HotelCode

GROUP BY H.HotelCode, H.Name

ORDER BY TotalOccupants DESC;

1. Return all resources for a given hotel in descending order of quantity.

SELECT R.ResourceID, R.Name, R.Quantity

FROM Resource R

ORDER BY R.Quantity DESC;

1. Return all guests currently checked in at the hotel.

SELECT DISTINCT G.FirstName, G.LastName, B.CheckinDateTime, B.CheckoutDateTime

FROM Guest G

JOIN Booking B ON G.GuestID = B.GuestID

JOIN Hotel H ON B.HotelCode = H.HotelCode

WHERE H.Name = ? AND B.CheckinDateTime <= ? AND B.CheckoutDateTime > ?;

1. Return all guests checking out on a given day at a hotel.

SELECT DISTINCT G.FirstName, G.LastName, B.CheckoutDateTime

FROM Guest G

JOIN Booking B ON G.GuestID = B.GuestID

JOIN Hotel H ON B.HotelCode = H.HotelCode

WHERE H.Name = ? AND DATE(B.CheckoutDateTime) = ?;

1. Return all guests checking in on a given day at a hotel.

SELECT DISTINCT G.FirstName, G.LastName, B.CheckinDateTime

FROM Guest G

JOIN Booking B ON G.GuestID = B.GuestID

JOIN Hotel H ON B.HotelCode = H.HotelCode

WHERE H.Name = ? AND DATE(B.CheckinDateTime) = ?;

1. Return all guests by booking date for a given hotel.

SELECT DISTINCT G.FirstName, G.LastName, B.BookingDateTime

FROM Guest G

JOIN Booking B ON G.GuestID = B.GuestID

JOIN Hotel H ON B.HotelCode = H.HotelCode

WHERE H.Name = ? AND DATE(B.BookingDateTime) = ?;

1. Return staff whose first name starts with a given string of characters for a hotel.

SELECT FirstName, LastName

FROM Staff

JOIN Hotel ON Staff.HotelCode = Hotel.HotelCode

WHERE Hotel.Name = ? AND Staff.FirstName LIKE ?;

1. Return the most popular service in a given hotel.

SELECT

S.Name AS ServiceName,

COUNT(\*) AS NumberOfTimesOrdered

FROM

Service S

JOIN Bill B ON S.BillNum = B.InvoiceNum

JOIN Booking BK ON B.BookingID = BK.BookingID

JOIN Hotel H ON BK.HotelCode = H.HotelCode

WHERE

H.Name = ?

GROUP BY

S.Name

ORDER BY

NumberOfTimesOrdered DESC

LIMIT 1;