Project 2

Relational Model of Enterprises

This project can solve problems for altered enterprises. This project will develop a formal designation of the database schema for each enterprise. It will also cover relational schema for entity to entity relationships. This project figure relational model for two enterprises. The enterprises are Delta Airlines and Expedia Airline Reservation. My design use ER design of each enterprise and convert them into relational schema covering entities and entity-to-entity relationships. It implements the two enterprise database using SQLite and MySQL. Both databases are populated with relational tables for all relational schemas involved with each table containing tuples.

My design modifies the ER design of each enterprise that can be used by anyone. It also defines relations corresponding to entity sets and relationship sets in my design using SQLite and MySQL.

Relational Schemas

Relational Tables

SQL Script of DBs

ER diagrams

Delta Airlines

**Relational schema:**

Pilot ( Pilot ID, Last Name, First Name, Air Crew ID)

Airplane (Air ID, Model No., Airplane Type, Capacity)

Airport ( Airport ID, Name, City, State, Country)

Hangar ( Hangar No, Air ID, Location, Size, Hangar Empl ID)

Hangar Empl (Hangar Empl ID, Last Name, Middle Name, First Name, House Address, Phone Number, Email Address)

Flight Attendant (Attendant ID, Full Name, Air Crew ID, Height)

Air Crew (Air Crew, Last Name, Middle Name, First Name, House Address, Phone Number, Email Address, Position)

Loading Crew ( Load Crew ID, Full Name, House Address, Phone Number, Email Address, Air ID)

Flight (Flight No, Air ID, From, To, Departure Date, Arrival Date, Departure Time,

Arrival Time, Airport ID)

Passenger ( Passenger ID, Last Name, Middle Name, First Name, House Address, Phone Number, Email Address)

Flight Leg ( Leg No, Flight No, Destination, Airport Name)

Ticket Agent ( Ticket Agent ID, Air Crew ID)

**Relational schema relationship:**

Pilot\_X\_ Air Crew ( Pilot ID, Air Crew ID)

Hangar\_X\_ Hangar Empl ( Hangar No, Hangar Empl ID)

Flight Attendant\_X\_ Air Crew ( Attendant ID, Air Crew ID)

Flight\_X\_ Airplane ( Flight No, Air ID)

Flight Leg\_X\_ Flight ( Leg No, Flight No)

Ticket Agent\_X\_ Air Crew (Ticket Agent ID, Air Crew ID)

Airplane\_X\_ Airport ( Airport ID, Air ID)

Hangar\_X\_ Airplane ( Hangar No, Air ID)

Passenger\_X\_ Flight ( Passenger ID, Flight No)

Pilot\_X\_Airplane ( Pilot ID, Air ID)

Flight Attendant\_X\_Airplane ( Attendant ID, Air ID)

Loading Crew\_X\_Airplane (  Load Crew ID, Air ID)

**SQL Queries**

sqlite> .header on

sqlite> .mode column

sqlite> SELECT \* FROM Pilot

  ...> ;

Pilot\_ID    Last\_Name   First\_Name  AirCrew\_ID

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233           Rafi            Abbott           12346

243           saleem          Carson         12347

253           Tahir           Phelps          12348

263           Earnest        Graham        12349

273          Hassan Warner         12350

sqlite> SELECT Flight\_No

  ...> FROM Flight

  ...> WHERE Departure\_Date= '11/3/2016';

Flight\_No

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DAL460

DAL545

sqlite> SELECT Flight.Flight\_No, FlightLeg. Airport\_Name

  ...> FROM FlightLeg INNER JOIN Flight ON FlightLeg.Flight\_No = Flight.Flight\_No

  ...> UNION

  ...> SELECT Flight.Flight\_No, FlightLeg. Airport\_Name

  ...> FROM FlightLeg LEFT OUTER JOIN Flight ON FlightLeg.Flight\_No = Flight.Flight\_No;

Flight\_No    Airport\_Name

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DAL546      John F. Kennedy International Airport

DAL460      Jinnah international airport

DAL545      Quaid E Azam International Airport

sqlite> SELECT LoadCrew\_ID, Full\_Name, House\_Address,

...> FROM LoadingCrew

...> WHERE LoadCrew\_ID >= 123;

LoadCrew\_ID  Full\_Name                House\_Address

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123                 W Wright    West 87th St, New York, NY

124                Michael, Rabbi 45-32 ST, Middleburg, FL

125                Rafi, Ariel 111 E 48th St New York,NY

Expedia Airline Reservation

**Relational schema:**

Reservation (Reservation ID, Ticket Type, Booking Date, Customer ID)

Customer (Customer ID, Last Name, Middle Name, First Name, House Address, Phone Number, Email Address, DOB, Gender)

Flight (Flight No, Aircraft ID, From, To, Flight Type)

Flight Schedule ( Schedule ID, Aircraft ID, Flight No, Departure Date, Arrival  Date, Departure Time, Arrival Time, Departure Gate No, Arrival Gate No)

Aircraft ( Aircraft ID, Aircraft Type, Aircraft Capacity, Model No)

Seat ( Seat No, Cabin, Aircraft ID, Customer ID)

Airport ( Airport ID, Name, City, State, Country, Flight No)

Flight Leg ( Flight Leg ID, Flight No, Departure From, Arrival At)

Leg Instance ( Leg Instance ID, Flight Leg ID, Available Seats)

Payment ( Payment ID, Customer ID, Payment Method, Card Type, Card Number, Expiration Date, Payment Status)

**Relational schema relationship:**

Reservation\_X\_Customer ( Reservation ID,  Customer ID)

Flight\_X\_Customer ( Flight No, Customer ID)

Flight\_X\_Aircraft ( Flight No, Aircraft ID)

Seat\_X\_Aircraft ( Seat No, Aircraft ID)

Seat\_X\_Customer ( Seat No,  Customer ID)

Flight\_X\_Airport ( Flight No,  Airport ID)

Flight\_X\_Flight Leg ( Flight No,  Flight Leg ID)

Payment\_X\_Customer ( Payment ID, Customer ID)

Leg Instance\_X\_Flight Leg ( Leg Instance ID, Flight Leg ID)

Leg Instance\_X\_Seat ( Leg Instance ID, Seat No)

Flight\_X\_Flight Schedule  ( Flight No, Schedule ID)

Flight Schedule\_X\_Aircraft ( Schedule ID, Aircraft ID)

Airport\_X\_Aircraft ( Airport ID,  Aircraft ID)

**SQL Queries**

sqlite> .header on

sqlite> .mode column

sqlite> DELETE FROM Customer WHERE  Customer\_ID = 83784727;

sqlite> UPDATE Reservation SET Booking\_Date = '6/3/2016'

  ...> WHERE  Customer\_ID = 83772563;

sqlite> SELECT Flight\_No, Flight\_Type

  ...> FROM Flight

  ...> WHERE Flight\_from = 'Merzbruck Airport' OR 'Jaipur International Airport';

Flight\_No   Flight\_Type

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UA540        Nonstop

sqlite> SELECT Flight\_Schedule.Aircraft\_ID, Flight.Flight\_No

  ...>  FROM Flight\_Schedule, Flight

  ...> WHERE (Flight\_Schedule.Departure\_Date = '11/3/16')

  ...>  AND ( Flight. AirCraft\_ID = Flight\_Schedule.Aircraft\_ID);

Aircraft\_ID     Flight\_No

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3345              AA750

3348              SA545

sqlite> SELECT \* FROM Aircraft

  ...> ORDER BY Aircaft\_Capacity DESC;

Aircraft\_ID  Aircaft\_Type  Aircaft\_Capacity  Model\_No

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3360           sharjah           376                      B747

3348           sharjah         322                      B787

3345           sharjah           291                      B777

3357           sharjah           208                      A331

3354           sharjah          198                      B717

3351           Airbus            126                      A319

(45, 'B747', sharjah ', 376),

(46, 'B767', 'Sharjah ', 261),

(47, 'B777', 'Sharjah', 291),

(48, 'B787', ' Sharjah ', 322),

(49, 'A319', 'Airbus', 126),

(50, 'A320', 'Airbus', 160),

(51, 'A330', 'Airbus', 293),

(52, 'A332', 'Airbus', 234),

(53, 'B717', ' Sharjah ', 198),

(54, 'A331', 'Airbus', 208);

CREATE TABLE  Airport ( AirportID INT, Name TEXT, City TEXT, State  TEXT, Country  TEXT);

INSERT INTO Airport ( AirportID, Name, City, State, Country)

VALUES

(23, 'Hicksville International Airport', 'Hicksville', 'Florida', 'United States'),

(24, 'Doha Airport', 'Doha', 'Queensland', 'Australia'),

(25, 'Mirzapur Airport, 'Aachen', 'North Rhine-Westphalia', 'Japan'),

(26, ' Quaid E Azam International Airp Regional Airport', 'Apalachicola', 'cali', 'United States'),

(27, 'Peshawar International Airport', 'islamabad', 'Peshawar', 'pakistan'),

(28, 'Anapa Airport', 'Anapa Krasnodar', 'Krai', 'Russia'),

(29, Quaid E Azam International Airport, 'Quanzhou', 'Fujian', 'China'),

(30, Jinnah international Airport, 'Johor Bahru', 'Johor', 'Malaysia'),

(31, 'Northern Peninsula Airport', 'Bamaga', 'Queensland', 'Australia'),

(32, 'General Juan N. Álvarez International Airport', 'Acapulco', 'Guerrero', 'Mexico'),

(33, 'John F. Kennedy International Airport', 'New York City', 'New York', 'United States');

CREATE TABLE Hangar (HangarNo INT, AirID INT, Location TEXT, Size TEXT, HangarEmplID INT);

INSERT INTO Hangar (HangarNo, AirID, Location, Size, HangarEmplID)

VALUES

(234,46,'John.F.Kenndy Airport, NY', '20,000SF', 09),

(456,45,'Jacksonville International Airport,FL', '1,400SF', 03),

(489,50,'3507 Jack Northrop Ave., Hawthorne,NY', '18,000SF', 07),

(261,47, '7943 Woodley Ave., Van Nuys,FL', '43,000SF', 09),

(492,54, '3021 Airport Avenue, Santa Monica,CA', '35,000SF', 05),

CREATE TABLE HangarEmpl (HangarEmplID INT, FirstName TEXT, MiddleName TEXT, LastName TEXT, HouseAddress TEXT, PhoneNumber INT, EmailAddress TEXT);

INSERT INTO (HangarEmplID, FirstName, MiddleName,LastName, HouseAddress, PhoneNumber, EmailAddress)

VALUES

(05,'Nancy','Jr.','King','1545 2th Ave SNaples,CA 35102',8775251000,'educare@unisa.ac.za'),

(09,'John','NULL','Chang','1315 Tamiami Trl Naples,FL

34103',7190006662,'myLifeHelp@unisa.ac.za'),

(03,'Komal','NULL','Fox','2280 North Tamiami Trl Naples,FL 30010',2396597077,'econtech@unisa.ac.za'),

(07,'Jimmy','NULL','Green','790 Lexington Ave New York,NY 12222',7185831333,'applications@unisa.ac.za'),

(08,'Jenny,'Dash','White','244 E Houston St, New York, NY 10002',9172259018, 'Jennyd23@gmail.com');

CREATE TABLE FlightAttendant (AttendantID INT, FullName TEXT, AirCrewID INT, Height REAL);

INSERT INTO FlightAttendant (AttendantID, FullName, AirCrewID, Height)

VALUES

(2135,'Kam Hasen',12353,5.4),

(2136,'Julia Chan',12354,5.6),

(2137,'Joanne Liuk',12355,5.8),

(2139,'Lisa Forman',12357,5.3),

(2140,'Laura Fay',12358,5.7),

(2141,'Sahel Goles',12359,5.7),

(2144,'Robyn Cooper',12360,5.8),

(2145,'Cherry Michener',12361,5.2),

(2146,'Gina Osten',12362,5.4);

CREATE TABLE AirCrew (AirCrew INT, LastName TEXT, MiddleName TEXT, FirstName TEXT, HouseAddress TEXT, PhoneNumber INT, EmailAddress TEXT, Position TEXT);

INSERT INTO Air Crew (AirCrew, LastName, MiddleName, FirstName, HouseAddress, PhoneNumber, EmailAddress, Position)

VALUES

(12354, 'Chan','Jr.','Julia','630 1st Ave #4E, New York, NY, 10063',4045842233,    ‘[very.con@example.com](mailto:%27very.con@example.com)', 'Flight Attendant'),

(12355,    'Liuk','Danice','Joanne','419 N Fairfax Ave, Los Angeles, CA 90036',3237031221,'disymbol@example.com',  'Flight Attendant'),

(12356,    'Perez,'NULL','Diana', '724 N Highland Ave, Los Angeles, CA 90028',3237031221,'other.emh@example.com',  'Ticket Agent'),

(12357,    'Forman','Micheal',Lisa','3656 N Central Ave, Chicago, IL [60634',3102070127,'bugmaster@unisa.ac.za](mailto:60634%27,3102070127,%27bugmaster@unisa.ac.za)',  'Ticket Agent'),

(12358,    'Fay', 'NULL','Laura','240 Peachtree St NWAtlanta,GA 30303',3236537970,    ['famirm@unisa.ac.za](mailto:%27famirm@unisa.ac.za)',  'Flight Attendant'),

(12346,    'Vicky','NULL','Abbott','1400 W Sunset BlvdLos Angeles,CA 90026',3212532063,'Vicky.doe@example.com','Pilot'),

(12347,    'Leo','NULL','Carson','8432 W 3rd StLos Angeles,CA 90048',2392311712,'Abc.car@gmail.com’,    'Pilot'),                        (12348, 'Doug','Jude','Phelps','08 S Barrington AveLos Angeles,CA 90049',2394346116,'doug@unisa.ac.za','Pilot');

