Group 20 Project

Bhavajna Kallakuri (202003046**)**

Divyansh Jain (202003047**)**

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Bus Management System

Relational Model to SQL DDL

Constraints:

1. Gender of EMPLOYEE and CUSTOMER must be either M, F or O
2. If BusID of BUS is updated, then it should be reflected in all referencing relations.
3. Person_Role of EMPLOYEE must be either 1, 2 or 3
   - ✦ 1 - Driver
   - ✦ 2 - Conductor
   - ✦ 3 - Manager (has access to all the confidential information)
4. If any changes are made in UserID of USER, they should be reflected in the referencing relations.
5. Ac_or_not of BUS can be only 1(AC Bus) or 2(Non AC Bus).
6. If an EMPLOYEE is leaving the company, then the USER details can be stored in the database.
7. If a PARCEL or TICKET booking is cancelled, then the corresponding details should be deleted(For future references, Payment details should not be deleted).
8. Every USER should have FName, LName and they both together should be unique for every user
9. An EMPLOYEE cannot leave the company if he/she is assigned to a future booking.
10. If a Booking is cancelled, then the Status of the SEAT should be set default
11. Value of Status of SEAT should be either 0(Available) or 1(Not available) but not any other number.

12. If StationID of Station is updated, then it should be reflected in all referencing relations.
13. If RouteID of a ROUTE is updated, then it should be reflected in its referencing relations.
14. If a ROUTE is deleted, then the details of buses which are assigned to the given route should not be deleted.
15. Two STATIONS cannot be present with the same address (address should be unique for every station).
16. Product_type of PARCEL can only be 1(If the objects in the parcel are damageable) or 2(If the objects in the parcel are non-damageable).
17. Value of Category in User will be 1 if the user is an Employee. It will be 2 if the user is a Customer
18. Value of Payment mode in Payment is 0 when the payment is offline. In all the other cases, it's value will be 1.

SQL DDL Code:

```
—DROP SCHEMA bus_database CASCADE;


CREATE SCHEMA bus_database;
SET SEARCH_PATH TO bus_database;


CREATE DOMAIN NAME_DOMAIN as VARCHAR(30);
CREATE DOMAIN DOMAIN_2 as VARCHAR(255); --To store the
variables whose size is unknown(can be very large or small)
CREATE DOMAIN ID_DOMAIN as DECIMAL(7,0);
CREATE DOMAIN USER_DOMAIN as DECIMAL(7,0);
CREATE DOMAIN MONEY_DOMAIN as DECIMAL(8,4);


CREATE TABLE Route
(
```

```
    RouteID ID_DOMAIN NOT NULL,
    Source_name NAME_DOMAIN ,
    Departure_time TIME NOT NULL,
    Arrival_time TIME NOT NULL,
    Destination_name NAME_DOMAIN,
    Distance DECIMAL(6,3) NOT NULL,
    Scheduled_Date DATE,
    PRIMARY KEY (RouteID)
);

CREATE TABLE Bus
(
    Type_of_bus VARCHAR(20) NOT NULL,
    Model VARCHAR(20) NOT NULL,
    AC_or_not SMALLINT NOT NULL CHECK (AC_or_not = 1 or
AC_or_not = 2),
    Available_Number_of_seats INT NOT NULL,
    Total_number_of_seats INT NOT NULL,
    Bus_number VARCHAR(20) ,
    BusID ID_DOMAIN ,
    RouteID ID_DOMAIN,
    PRIMARY KEY (BusID),
    FOREIGN KEY (RouteID) REFERENCES Route (RouteID) ON
DELETE SET DEFAULT ON UPDATE CASCADE
);

CREATE TABLE Parcels
(
    ParcelID ID_DOMAIN ,
    Product_Type SMALLINT ,
```

```
    Weight INT NOT NULL,
    BusID ID_DOMAIN,
    PRIMARY KEY (ParcelID),
    FOREIGN KEY (BusID) REFERENCES Bus(BusID) ON UPDATE
CASCADE ON DELETE RESTRICT,
    CHECK(Product_Type = 1 or Product_Type = 2)
);


CREATE TABLE Booking
(
    BookingID ID_DOMAIN ,
    Status BOOLEAN NOT NULL,
    Source_name NAME_DOMAIN NOT NULL,
    Destination NAME_DOMAIN NOT NULL,
    Number_of_tickets INT,
    ParcelID ID_DOMAIN ,
    Date_of_booking DATE NOT NULL,
    Total_amount MONEY_DOMAIN NOT NULL,
    PRIMARY KEY (BookingID),
    FOREIGN KEY (ParcelID) REFERENCES Parcels(ParcelID) ON
DELETE CASCADE
);


CREATE TABLE Seat
(
    SeatID VARCHAR(5) ,
    BusID ID_DOMAIN NOT NULL,
    Status BOOLEAN DEFAULT '0',
```

```
    BookingID ID_DOMAIN,
    PRIMARY KEY (SeatID, BusID),
    FOREIGN KEY (BusID) REFERENCES Bus(BusID) ON UPDATE
CASCADE,
    FOREIGN KEY (BookingID) REFERENCES Booking(BookingID) ON
DELETE SET DEFAULT
);



CREATE TABLE User_Login
(
    UserID USER_DOMAIN ,
    Username VARCHAR(15) NOT NULL,
    Password_user VARCHAR(15) NOT NULL,
    Category SMALLINT NOT NULL,
    MobileNo VARCHAR(15) NOT NULL UNIQUE,
    Email DOMAIN_2 NOT NULL,
    Doornum NAME_DOMAIN NOT NULL,
    Landmark DOMAIN_2,
    District NAME_DOMAIN,
    State_name NAME_DOMAIN NOT NULL,
    Pincode CHAR(6) NOT NULL,
    FName NAME_DOMAIN NOT NULL,
    LName NAME_DOMAIN NOT NULL,
    AadharNo CHAR(12) NOT NULL,
    UNIQUE (FName,LName),
    PRIMARY KEY (UserID)
);
```

```
CREATE TABLE Employee
(
     EmployeeID USER_DOMAIN ,
     UserID USER_DOMAIN NOT NULL,
     BusID ID_DOMAIN ,
     Person_Role SMALLINT NOT NULL,
     Gender CHAR(1) NOT NULL CHECK(Gender = 'M' or Gender =
'F' or Gender = 'O'),
     DOB DATE ,
     PRIMARY KEY (EmployeeID),
     FOREIGN KEY (UserID) REFERENCES User_Login(UserID) ON
UPDATE CASCADE ON DELETE CASCADE,
     FOREIGN KEY (BusID) REFERENCES Bus(BusID) ON UPDATE
CASCADE ON DELETE RESTRICT,
     CHECK (Person_Role = 1 or Person_Role = 2 or Person_Role
= 3)
);


CREATE TABLE Station
(
     StationID ID_DOMAIN ,
     Station_name NAME_DOMAIN NOT NULL,
     District NAME_DOMAIN NOT NULL,
     State_name NAME_DOMAIN  NOT NULL,
     PRIMARY KEY (StationID),
     UNIQUE (Station_name, District, State_name)
);



CREATE TABLE Payment
```

```
(
    PaymentID ID_DOMAIN ,
    Payment_mode SMALLINT NOT NULL,
    Date_of_payment TIMESTAMP ,
    Amount_Paid MONEY_DOMAIN NOT NULL,
    Payment_Gateway VARCHAR(30) NOT NULL,
    BookingID ID_DOMAIN NOT NULL,
    PRIMARY KEY (PaymentID),
    FOREIGN KEY (BookingID) REFERENCES Booking(BookingID) ON
DELETE RESTRICT
);

CREATE TABLE Customer
(
    CustomerID USER_DOMAIN ,
    UserID USER_DOMAIN NOT NULL,
    Gender CHAR(1) NOT NULL CHECK(Gender = 'M' or Gender =
'F' or Gender = 'O'),
    DOB DATE NOT NULL,
    PaymentID ID_DOMAIN NOT NULL,
    BookingID ID_DOMAIN NOT NULL,
    PRIMARY KEY (CustomerID),
    FOREIGN KEY (PaymentID) REFERENCES Payment(PaymentID) ON
UPDATE CASCADE ON DELETE RESTRICT,
    FOREIGN KEY (UserID) REFERENCES User_Login(UserID) ON
UPDATE CASCADE ON DELETE CASCADE,
    FOREIGN KEY (BookingID) REFERENCES Booking(BookingID) ON
UPDATE CASCADE ON DELETE RESTRICT
);
```

```
CREATE TABLE Connects
(
    RouteID ID_DOMAIN NOT NULL,
    StationID ID_DOMAIN NOT NULL,
    PRIMARY KEY (RouteID, StationID),
    FOREIGN KEY (RouteID) REFERENCES Route(RouteID) ON UPDATE
CASCADE ON DELETE CASCADE,
    FOREIGN KEY (StationID) REFERENCES Station(StationID) ON
UPDATE CASCADE ON DELETE CASCADE
);
```