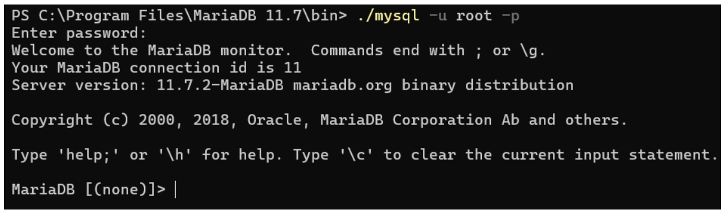
Name: Natalie Poche
Assignment: Homework 6
Due: April 23, 2025

Homework 6

Problem Statement: This Assignment uses the following Travel Agency database schema with the specified primary and foreign key constrains:

- Booking(<u>agents: String</u>, <u>traveler_ssn: integer</u>, <u>trip_id: integer</u>)
    - *Foreign Keys*: traveler_ssn references Traveler(ssn), trip_id references Trip(id), agent references TravelAgent(name)
- GoesOn(<u>ssn: integer</u>, <u>id: integer</u>)
    - *Foreign Keys*: ssn references Traveler(ssn), id references Trip(id)
- Leg(<u>Trip_id: integer</u>, <u>startLocation: String</u>, <u>endLocation: String</u>, startDate: Date, endDate: Date)
    - *Foreign Keys*: trip_id references Trip(id)
- Owns(ssn: integer, <u>passport number: integer</u>, <u>country: String</u>)
    - *Foreign keys*: ssn references Traveler(ssn)
- Passport(<u>passport number: integer</u>, <u>country: String</u>, expirationDate: Date, holderName: String)
- TravelAgent(<u>name: String</u>, years experience: integer, phone: String)
- Traveler(name: String, <u>ssn: integer</u>, dob: Date)
- Trip(<u>id: integer</u>, start location: String, end location: String, start date: Date, end date: Date)

Part 0: Start MariaDB



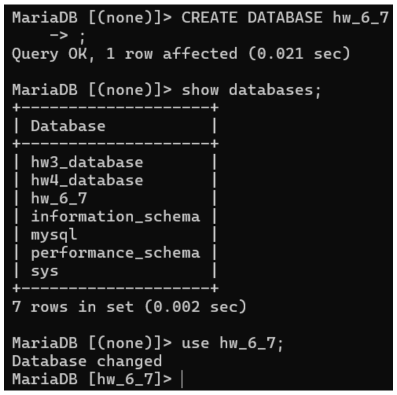
```
PS C:\Program Files\MariaDB 11.7\bin> ./mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 11
Server version: 11.7.2-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

Part 1: Create a new Database



```
MariaDB [(none)]> CREATE DATABASE hw_6_7
    -> ;
Query OK, 1 row affected (0.021 sec)

MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| hw3_database       |
| hw4_database       |
| hw_6_7             |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
7 rows in set (0.002 sec)

MariaDB [(none)]> use hw_6_7;
Database changed
MariaDB [hw_6_7]>
```

Part 2: Create Tables with Constraints

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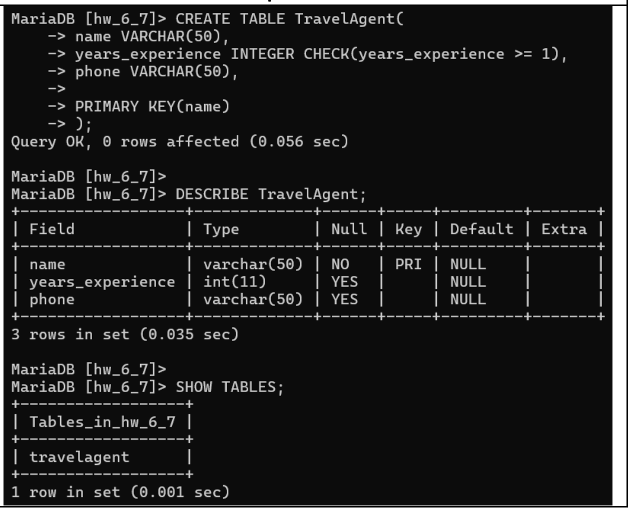
1. **Primary Keys and Foreign Keys:** Include primary keys for each table and establish foreign key constrains as specified in the schema
2. **Attribute-Based Constraints:** Define the following two attribute based constraints –
    a. years_experience in TravelAgent must be greater than or equal to 1.

SQL Statements	SQL Implementation

CREATE TABLE TravelAgent(
    name VARCHAR(50),
    years_experience INTEGER
    CHECK(years_experience >= 1),
    phone VARCHAR(50),
 	
    PRIMARY KEY(name)
);
 	
DESCRIBE TravelAgent;
 	
SHOW TABLES;
	

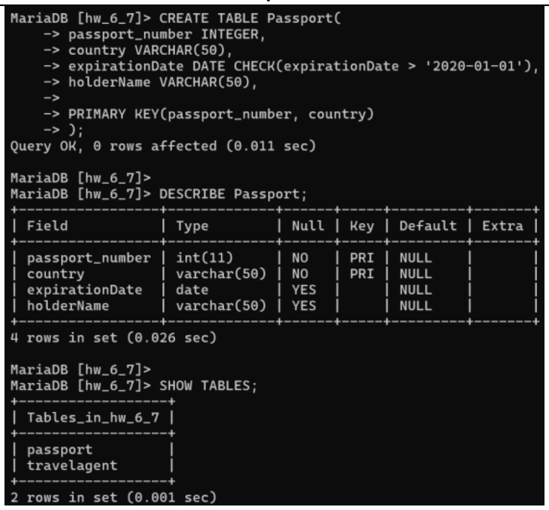
```
MariaDB [hw_6_7]> CREATE TABLE TravelAgent(
    -> name VARCHAR(50),
    -> years_experience INTEGER CHECK(years_experience >= 1),
    -> phone VARCHAR(50),
    ->
    -> PRIMARY KEY(name)
    -> );
Query OK, 0 rows affected (0.056 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE TravelAgent;
+------------------+-------------+------+-----+---------+-------+
| Field            | Type        | Null | Key | Default | Extra |
+------------------+-------------+------+-----+---------+-------+
| name             | varchar(50) | NO   | PRI | NULL    |       |
| years_experience | int(11)     | YES  |     | NULL    |       |
| phone            | varchar(50) | YES  |     | NULL    |       |
+------------------+-------------+------+-----+---------+-------+
3 rows in set (0.035 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+------------------+
| Tables_in_hw_6_7 |
+------------------+
| travelagent      |
+------------------+
1 row in set (0.001 sec)
```

    b. expirationDate in Passport must be after January 1, 2020.

SQL Statements	SQL Implementation

CREATE TABLE Passport(
    passport_number INTEGER,
    country VARCHAR(50),
    expirationDate DATE
    CHECK(expirationDate > '2020-01-01'),
    holderName VARCHAR(50),
 	
    PRIMARY KEY(passport_number, country)
);
 	
DESCRIBE Passport;
 	
SHOW TABLES;
	

```
MariaDB [hw_6_7]> CREATE TABLE Passport(
    -> passport_number INTEGER,
    -> country VARCHAR(50),
    -> expirationDate DATE CHECK(expirationDate > '2020-01-01'),
    -> holderName VARCHAR(50),
    ->
    -> PRIMARY KEY(passport_number, country)
    -> );
Query OK, 0 rows affected (0.011 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE Passport;
+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| passport_number | int(11)     | NO   | PRI | NULL    |       |
| country         | varchar(50) | NO   | PRI | NULL    |       |
| expirationDate  | date        | YES  |     | NULL    |       |
| holderName      | varchar(50) | YES  |     | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
4 rows in set (0.026 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+------------------+
| Tables_in_hw_6_7 |
+------------------+
| passport         |
| travelagent      |
+------------------+
2 rows in set (0.001 sec)
```

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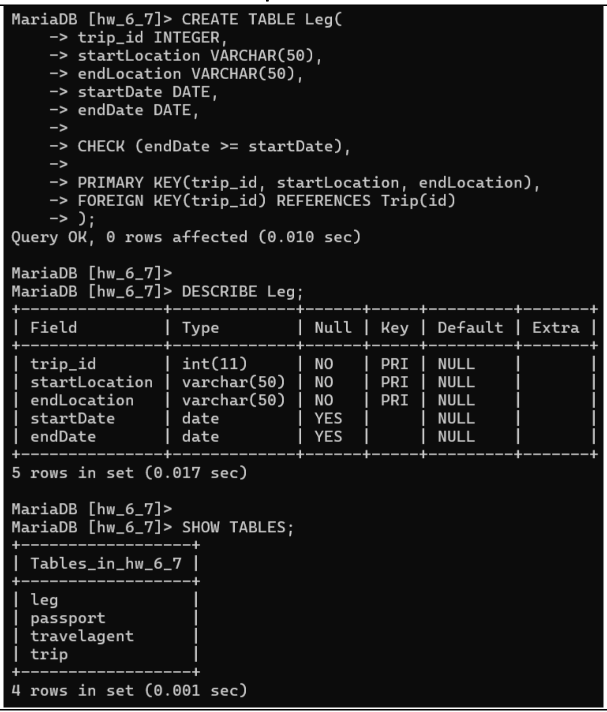
3. **Tuple-Based Constraints:** Define the following tuple-based constraints:
   a. In Leg, ensure endDate is not earlier than startDate

SQL Statements	SQL Implementation

CREATE TABLE Leg(
trip_id INTEGER,
startLocation VARCHAR(50),
endLocation VARCHAR(50),
startDate DATE,
endDate DATE,
 	
CHECK (endDate >= startDate),
 	
PRIMARY KEY(trip_id, startLocation, endLocation),
FOREIGN KEY(trip_id) REFERENCES Trip(id)
);
 	
DESCRIBE Leg;
 	
SHOW TABLES;
	

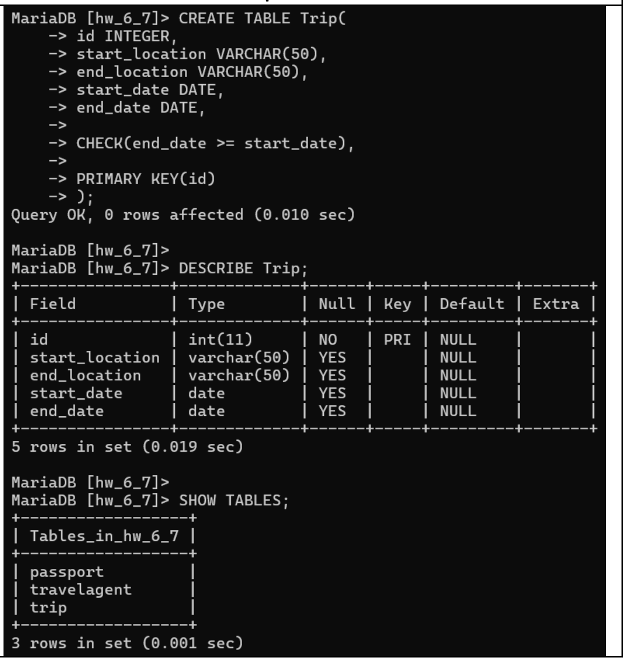
```
MariaDB [hw_6_7]> CREATE TABLE Leg(
    -> trip_id INTEGER,
    -> startLocation VARCHAR(50),
    -> endLocation VARCHAR(50),
    -> startDate DATE,
    -> endDate DATE,
    ->
    -> CHECK (endDate >= startDate),
    ->
    -> PRIMARY KEY(trip_id, startLocation, endLocation),
    -> FOREIGN KEY(trip_id) REFERENCES Trip(id)
    -> );
Query OK, 0 rows affected (0.010 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE Leg;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| trip_id       | int(11)     | NO   | PRI | NULL    |       |
| startLocation | varchar(50) | NO   | PRI | NULL    |       |
| endLocation   | varchar(50) | NO   | PRI | NULL    |       |
| startDate     | date        | YES  |     | NULL    |       |
| endDate       | date        | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
5 rows in set (0.017 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+------------------+
| Tables_in_hw_6_7 |
+------------------+
| leg              |
| passport         |
| travelagent      |
| trip             |
+------------------+
4 rows in set (0.001 sec)
```

   b. In Trip, ensure end_date is not earlier than start_date

SQL Statements	SQL Implementation

CREATE TABLE Trip(
id INTEGER,
start_location VARCHAR(50),
end_location VARCHAR(50),
start_date DATE,
end_date DATE,
 	
CHECK(end_date >= start_date),
 	
PRIMARY KEY(id)
);
 	
DESCRIBE Trip;
 	
SHOW TABLES;
	

```
MariaDB [hw_6_7]> CREATE TABLE Trip(
    -> id INTEGER,
    -> start_location VARCHAR(50),
    -> end_location VARCHAR(50),
    -> start_date DATE,
    -> end_date DATE,
    ->
    -> CHECK(end_date >= start_date),
    ->
    -> PRIMARY KEY(id)
    -> );
Query OK, 0 rows affected (0.010 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE Trip;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| id             | int(11)     | NO   | PRI | NULL    |       |
| start_location | varchar(50) | YES  |     | NULL    |       |
| end_location   | varchar(50) | YES  |     | NULL    |       |
| start_date     | date        | YES  |     | NULL    |       |
| end_date       | date        | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.019 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+------------------+
| Tables_in_hw_6_7 |
+------------------+
| passport         |
| travelagent      |
| trip             |
+------------------+
3 rows in set (0.001 sec)
```

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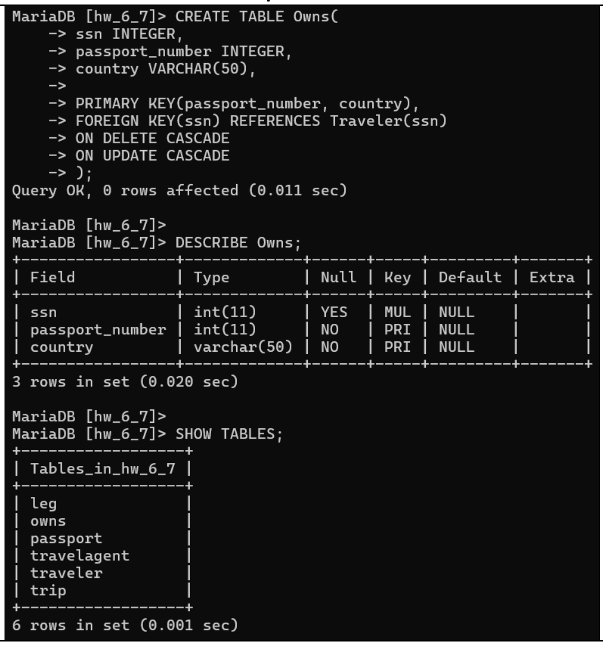
4. **Cascade on Update and Delete:** Set up a foreign key constrain such that updating and deleting a Traveler will automatically update and delete all related records in Booking, Owns, and GoesOn tables.

SQL Statements	SQL Implementation

CREATE TABLE Owns(
    ssn INTEGER,
    passport_number INTEGER,
    country VARCHAR(50),
 	
    PRIMARY KEY(passport_number, country),
    FOREIGN KEY(ssn) REFERENCES Traveler(ssn)
      ON DELETE CASCADE
      ON UPDATE CASCADE
);
 	
DESCRIBE Owns;
 	
SHOW TABLES;
	

```
MariaDB [hw_6_7]> CREATE TABLE Owns(
    -> ssn INTEGER,
    -> passport_number INTEGER,
    -> country VARCHAR(50),
    ->
    -> PRIMARY KEY(passport_number, country),
    -> FOREIGN KEY(ssn) REFERENCES Traveler(ssn)
    -> ON DELETE CASCADE
    -> ON UPDATE CASCADE
    -> );
Query OK, 0 rows affected (0.011 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE Owns;
+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| ssn             | int(11)     | YES  | MUL | NULL    |       |
| passport_number | int(11)     | NO   | PRI | NULL    |       |
| country         | varchar(50) | NO   | PRI | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
3 rows in set (0.020 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+------------------+
| Tables_in_hw_6_7 |
+------------------+
| leg              |
| owns             |
| passport         |
| travelagent      |
| traveler         |
| trip             |
+------------------+
6 rows in set (0.001 sec)
```

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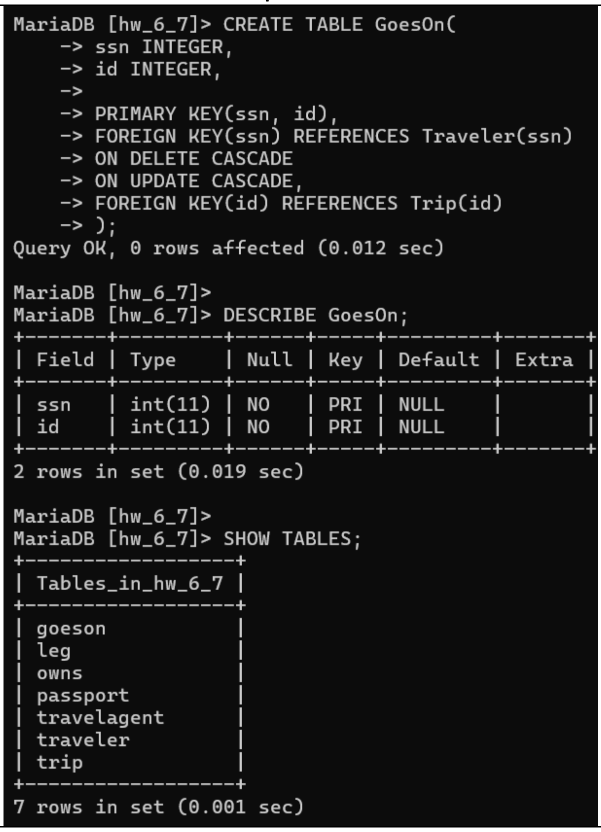
SQL Statements	SQL Implementation
CREATE TABLE GoesOn(ssn INTEGER, id INTEGER, PRIMARY KEY(ssn, id), FOREIGN KEY(ssn) REFERENCES Traveler(ssn) ON DELETE CASCADE ON UPDATE CASCADE, FOREIGN KEY(id) REFERENCES Trip(id)); DESCRIBE GoesOn; SHOW TABLES;	

```
MariaDB [hw_6_7]> CREATE TABLE GoesOn(
    -> ssn INTEGER,
    -> id INTEGER,
    ->
    -> PRIMARY KEY(ssn, id),
    -> FOREIGN KEY(ssn) REFERENCES Traveler(ssn)
    -> ON DELETE CASCADE
    -> ON UPDATE CASCADE,
    -> FOREIGN KEY(id) REFERENCES Trip(id)
    -> );
Query OK, 0 rows affected (0.012 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE GoesOn;
+-------+---------+------+-----+---------+-------+
| Field | Type    | Null | Key | Default | Extra |
+-------+---------+------+-----+---------+-------+
| ssn   | int(11) | NO   | PRI | NULL    |       |
| id    | int(11) | NO   | PRI | NULL    |       |
+-------+---------+------+-----+---------+-------+
2 rows in set (0.019 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+-------------------+
| Tables_in_hw_6_7 |
+-------------------+
| goeson            |
| leg               |
| owns              |
| passport          |
| travelagent       |
| traveler          |
| trip              |
+-------------------+
7 rows in set (0.001 sec)
```

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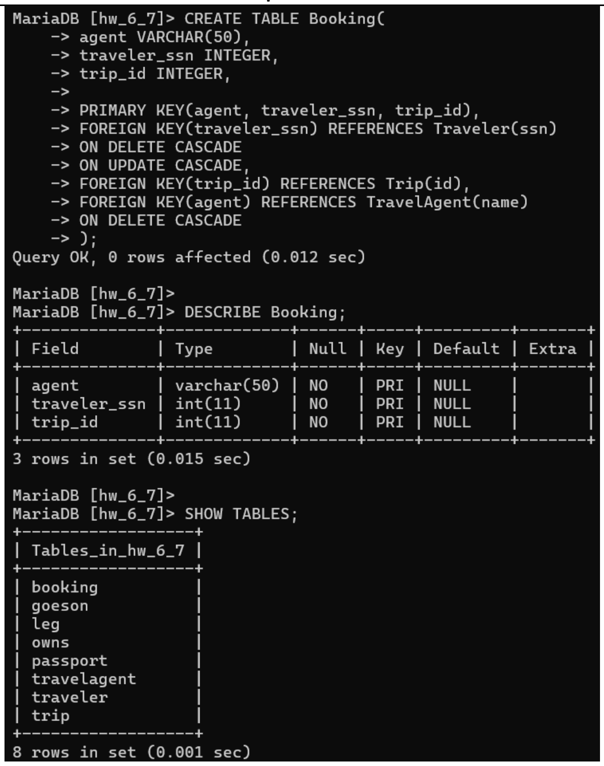
5. **Cascade on Delete:** Implement a foreign key constraint in Booking such that if an agent in TravelAgent is deleted the agent attribute in any related Booking records is deleted.

SQL Statements	SQL Implementation

CREATE TABLE Booking(
    agent VARCHAR(50),
    traveler_ssn INTEGER,
    trip_id INTEGER,
 	
    PRIMARY KEY(agent, traveler_ssn, trip_id),
    FOREIGN KEY(traveler_ssn) REFERENCES Traveler(ssn)
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY(trip_id) REFERENCES Trip(id),
    FOREIGN KEY(agent) REFERENCES TravelAgent(name)
        ON DELETE CASCADE
);
 	
DESCRIBE Booking;
 	
SHOW TABLES;
	

```
MariaDB [hw_6_7]> CREATE TABLE Booking(
    -> agent VARCHAR(50),
    -> traveler_ssn INTEGER,
    -> trip_id INTEGER,
    ->
    -> PRIMARY KEY(agent, traveler_ssn, trip_id),
    -> FOREIGN KEY(traveler_ssn) REFERENCES Traveler(ssn)
    -> ON DELETE CASCADE
    -> ON UPDATE CASCADE,
    -> FOREIGN KEY(trip_id) REFERENCES Trip(id),
    -> FOREIGN KEY(agent) REFERENCES TravelAgent(name)
    -> ON DELETE CASCADE
    -> );
Query OK, 0 rows affected (0.012 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE Booking;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| agent        | varchar(50) | NO   | PRI | NULL    |       |
| traveler_ssn | int(11)     | NO   | PRI | NULL    |       |
| trip_id      | int(11)     | NO   | PRI | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
3 rows in set (0.015 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+------------------+
| Tables_in_hw_6_7 |
+------------------+
| booking          |
| goeson           |
| leg              |
| owns             |
| passport         |
| travelagent      |
| traveler         |
| trip             |
+------------------+
8 rows in set (0.001 sec)
```

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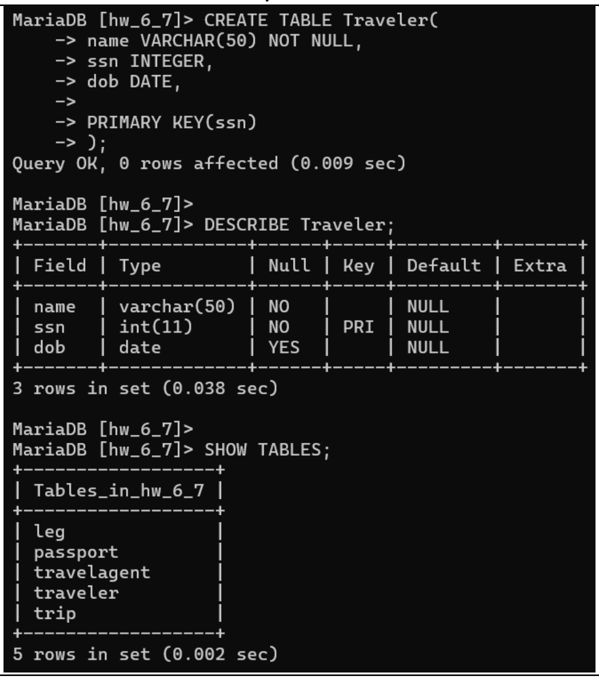
6. **NOT NULL Constraints:** Add a NOT NULL constrain to the name column in Traveler.

SQL Statements	SQL Implementation

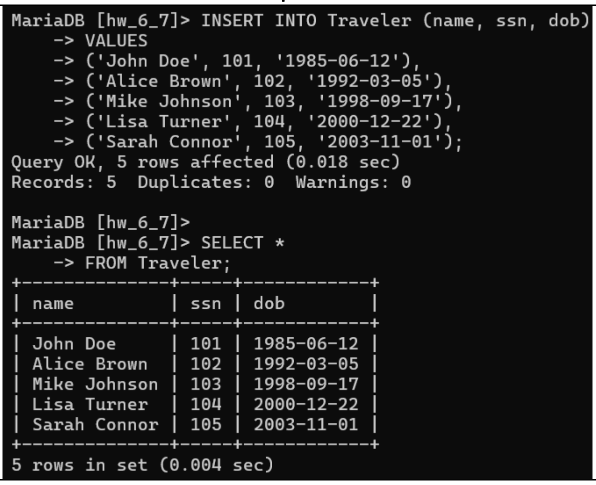
CREATE TABLE Traveler(
    name VARCHAR(50) NOT NULL,
    ssn INTEGER,
    dob DATE,
 	
    PRIMARY KEY(ssn)
);
 	
DESCRIBE Traveler;
 	
SHOW TABLES;
	

```
MariaDB [hw_6_7]> CREATE TABLE Traveler(
    -> name VARCHAR(50) NOT NULL,
    -> ssn INTEGER,
    -> dob DATE,
    ->
    -> PRIMARY KEY(ssn)
    -> );
Query OK, 0 rows affected (0.009 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE Traveler;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| name  | varchar(50) | NO   |     | NULL    |       |
| ssn   | int(11)     | NO   | PRI | NULL    |       |
| dob   | date        | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
3 rows in set (0.038 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+------------------+
| Tables_in_hw_6_7 |
+------------------+
| leg              |
| passport         |
| travelagent      |
| traveler         |
| trip             |
+------------------+
5 rows in set (0.002 sec)
```

Part 3: Insert Data

1. ** Insert Into ‘Traveler’, ‘TravelAgent’, ‘Trip’, and ‘Passport’ **:

SQL Statements	SQL Implementation

INSERT INTO Traveler (name, ssn, dob)
VALUES
('John Doe', 101, '1985-06-12'),
('Alice Brown', 102, '1992-03-05'),
('Mike Johnson', 103, '1998-09-17'),
('Lisa Turner', 104, '2000-12-22'),
('Sarah Connor', 105, '2003-11-01');
 	
SELECT *
FROM Traveler;
	

```
MariaDB [hw_6_7]> INSERT INTO Traveler (name, ssn, dob)
    -> VALUES
    -> ('John Doe', 101, '1985-06-12'),
    -> ('Alice Brown', 102, '1992-03-05'),
    -> ('Mike Johnson', 103, '1998-09-17'),
    -> ('Lisa Turner', 104, '2000-12-22'),
    -> ('Sarah Connor', 105, '2003-11-01');
Query OK, 5 rows affected (0.018 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Alice Brown  | 102 | 1992-03-05 |
| Mike Johnson | 103 | 1998-09-17 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
+--------------+-----+------------+
5 rows in set (0.004 sec)
```

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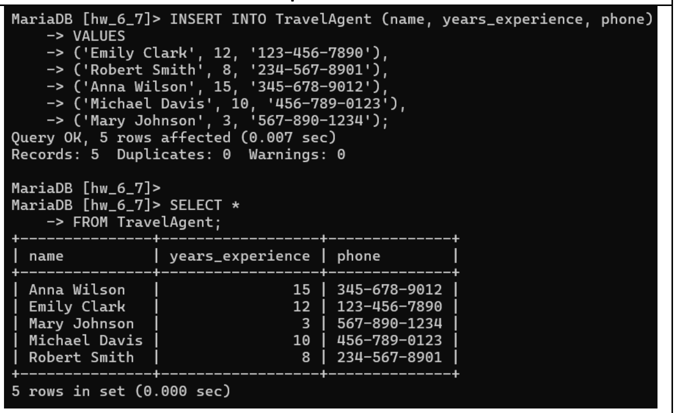
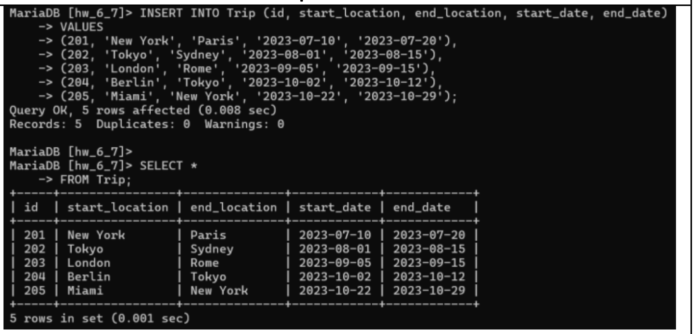
SQL Statements	SQL Implementation

INSERT INTO TravelAgent (name, years_experience, phone)
VALUES
('Emily Clark', 12, '123-456-7890'),
('Robert Smith', 8, '234-567-8901'),
('Anna Wilson', 15, '345-678-9012'),
('Michael Davis', 10, '456-789-0123'),
('Mary Johnson', 3, '567-890-1234');
 	
SELECT *
FROM TravelAgent;
	

```
MariaDB [hw_6_7]> INSERT INTO TravelAgent (name, years_experience, phone)
    -> VALUES
    -> ('Emily Clark', 12, '123-456-7890'),
    -> ('Robert Smith', 8, '234-567-8901'),
    -> ('Anna Wilson', 15, '345-678-9012'),
    -> ('Michael Davis', 10, '456-789-0123'),
    -> ('Mary Johnson', 3, '567-890-1234');
Query OK, 5 rows affected (0.007 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM TravelAgent;
+---------------+------------------+--------------+
| name          | years_experience | phone        |
+---------------+------------------+--------------+
| Anna Wilson   |               15 | 345-678-9012 |
| Emily Clark   |               12 | 123-456-7890 |
| Mary Johnson  |                3 | 567-890-1234 |
| Michael Davis |               10 | 456-789-0123 |
| Robert Smith  |                8 | 234-567-8901 |
+---------------+------------------+--------------+
5 rows in set (0.000 sec)
```

SQL Statements	SQL Implementation

INSERT INTO Trip (id, start_location, end_location, start_date, end_date)
VALUES
(201, 'New York', 'Paris', '2023-07-10', '2023-07-20'),
(202, 'Tokyo', 'Sydney', '2023-08-01', '2023-08-15'),
(203, 'London', 'Rome', '2023-09-05', '2023-09-15'),
(204, 'Berlin', 'Tokyo', '2023-10-02', '2023-10-12'),
(205, 'Miami', 'New York', '2023-10-22', '2023-10-29');
 	
SELECT *
FROM Trip;
	

```
MariaDB [hw_6_7]> INSERT INTO Trip (id, start_location, end_location, start_date, end_date)
    -> VALUES
    -> (201, 'New York', 'Paris', '2023-07-10', '2023-07-20'),
    -> (202, 'Tokyo', 'Sydney', '2023-08-01', '2023-08-15'),
    -> (203, 'London', 'Rome', '2023-09-05', '2023-09-15'),
    -> (204, 'Berlin', 'Tokyo', '2023-10-02', '2023-10-12'),
    -> (205, 'Miami', 'New York', '2023-10-22', '2023-10-29');
Query OK, 5 rows affected (0.008 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Trip;
+-----+----------------+--------------+------------+------------+
| id  | start_location | end_location | start_date | end_date   |
+-----+----------------+--------------+------------+------------+
| 201 | New York       | Paris        | 2023-07-10 | 2023-07-20 |
| 202 | Tokyo          | Sydney       | 2023-08-01 | 2023-08-15 |
| 203 | London         | Rome         | 2023-09-05 | 2023-09-15 |
| 204 | Berlin         | Tokyo        | 2023-10-02 | 2023-10-12 |
| 205 | Miami          | New York     | 2023-10-22 | 2023-10-29 |
+-----+----------------+--------------+------------+------------+
5 rows in set (0.001 sec)
```

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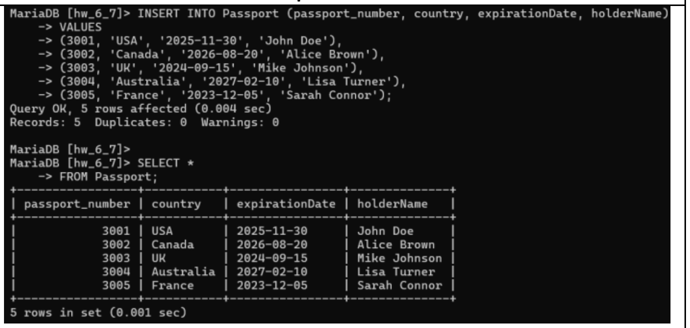
SQL Statements	SQL Implementation

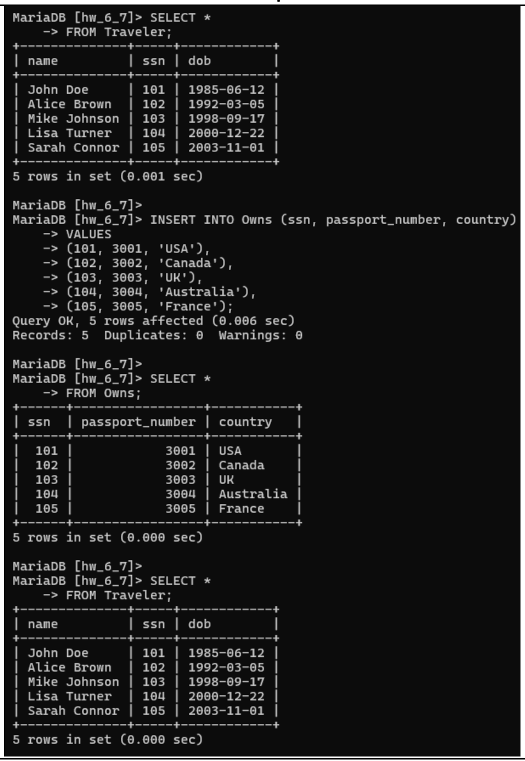
INSERT INTO Passport (passport_number, country, expirationDate, holderName)
VALUES
(3001, 'USA', '2025-11-30', 'John Doe'),
(3002, 'Canada', '2026-08-20', 'Alice Brown'),
(3003, 'UK', '2024-09-15', 'Mike Johnson'),
(3004, 'Australia', '2027-02-10', 'Lisa Turner'),
(3005, 'France', '2023-12-05', 'Sarah Connor');
 	
SELECT *
FROM Passport;
	

```
MariaDB [hw_6_7]> INSERT INTO Passport (passport_number, country, expirationDate, holderName)
    -> VALUES
    -> (3001, 'USA', '2025-11-30', 'John Doe'),
    -> (3002, 'Canada', '2026-08-20', 'Alice Brown'),
    -> (3003, 'UK', '2024-09-15', 'Mike Johnson'),
    -> (3004, 'Australia', '2027-02-10', 'Lisa Turner'),
    -> (3005, 'France', '2023-12-05', 'Sarah Connor');
Query OK, 5 rows affected (0.004 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Passport;
+-----------------+-----------+----------------+--------------+
| passport_number | country   | expirationDate | holderName   |
+-----------------+-----------+----------------+--------------+
|            3001 | USA       | 2025-11-30     | John Doe     |
|            3002 | Canada    | 2026-08-20     | Alice Brown  |
|            3003 | UK        | 2024-09-15     | Mike Johnson |
|            3004 | Australia | 2027-02-10     | Lisa Turner  |
|            3005 | France    | 2023-12-05     | Sarah Connor |
+-----------------+-----------+----------------+--------------+
5 rows in set (0.001 sec)
```

2. ** Insert into ‘Owns’ **:

SQL Statements	SQL Implementation

SELECT *
FROM Traveler;
 	
INSERT INTO Owns (ssn, passport_number, country)
VALUES
(101, 3001, 'USA'),
(102, 3002, 'Canada'),
(103, 3003, 'UK'),
(104, 3004, 'Australia'),
(105, 3005, 'France');
 	
SELECT *
FROM Owns;
 	
SELECT *
FROM Traveler;
	

```
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Alice Brown  | 102 | 1992-03-05 |
| Mike Johnson | 103 | 1998-09-17 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
+--------------+-----+------------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> INSERT INTO Owns (ssn, passport_number, country)
    -> VALUES
    -> (101, 3001, 'USA'),
    -> (102, 3002, 'Canada'),
    -> (103, 3003, 'UK'),
    -> (104, 3004, 'Australia'),
    -> (105, 3005, 'France');
Query OK, 5 rows affected (0.006 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Owns;
+------+-----------------+-----------+
| ssn  | passport_number | country   |
+------+-----------------+-----------+
|  101 |            3001 | USA       |
|  102 |            3002 | Canada    |
|  103 |            3003 | UK        |
|  104 |            3004 | Australia |
|  105 |            3005 | France    |
+------+-----------------+-----------+
5 rows in set (0.000 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Alice Brown  | 102 | 1992-03-05 |
| Mike Johnson | 103 | 1998-09-17 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
+--------------+-----+------------+
5 rows in set (0.000 sec)
```

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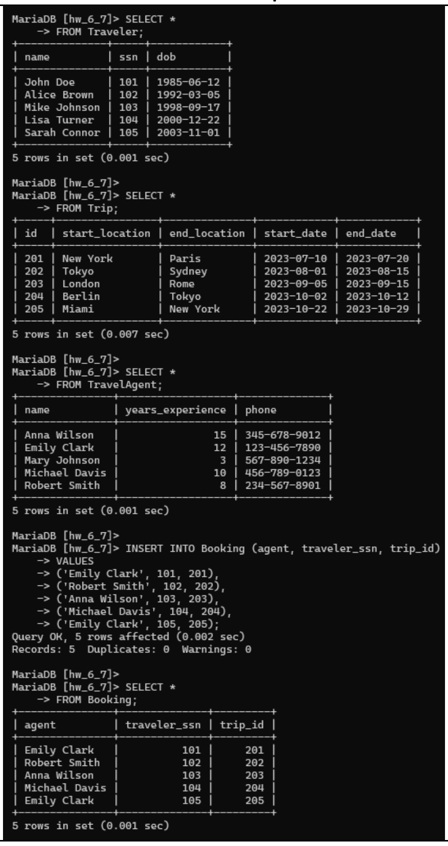
3. ** Insert into ‘Booking’ **:

SQL Statements	SQL Implementation

SELECT *
FROM Traveler;
 	
SELECT *
FROM Trip;
 	
SELECT *
FROM TravelAgent;
 	
INSERT INTO Booking (agent, traveler_ssn, trip_id)
VALUES
('Emily Clark', 101, 201),
('Robert Smith', 102, 202),
('Anna Wilson', 103, 203),
('Michael Davis', 104, 204),
('Emily Clark', 105, 205);
 	
SELECT *
FROM Booking;
	

```
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Alice Brown  | 102 | 1992-03-05 |
| Mike Johnson | 103 | 1998-09-17 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
+--------------+-----+------------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Trip;
+-----+----------------+--------------+------------+------------+
| id  | start_location | end_location | start_date | end_date   |
+-----+----------------+--------------+------------+------------+
| 201 | New York       | Paris        | 2023-07-10 | 2023-07-20 |
| 202 | Tokyo          | Sydney       | 2023-08-01 | 2023-08-15 |
| 203 | London         | Rome         | 2023-09-05 | 2023-09-15 |
| 204 | Berlin         | Tokyo        | 2023-10-02 | 2023-10-12 |
| 205 | Miami          | New York     | 2023-10-22 | 2023-10-29 |
+-----+----------------+--------------+------------+------------+
5 rows in set (0.007 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM TravelAgent;
+---------------+------------------+--------------+
| name          | years_experience | phone        |
+---------------+------------------+--------------+
| Anna Wilson   |               15 | 345-678-9012 |
| Emily Clark   |               12 | 123-456-7890 |
| Mary Johnson  |                3 | 567-890-1234 |
| Michael Davis |               10 | 456-789-0123 |
| Robert Smith  |                8 | 234-567-8901 |
+---------------+------------------+--------------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> INSERT INTO Booking (agent, traveler_ssn, trip_id)
    -> VALUES
    -> ('Emily Clark', 101, 201),
    -> ('Robert Smith', 102, 202),
    -> ('Anna Wilson', 103, 203),
    -> ('Michael Davis', 104, 204),
    -> ('Emily Clark', 105, 205);
Query OK, 5 rows affected (0.002 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Booking;
+---------------+--------------+---------+
| agent         | traveler_ssn | trip_id |
+---------------+--------------+---------+
| Emily Clark   |          101 |     201 |
| Robert Smith  |          102 |     202 |
| Anna Wilson   |          103 |     203 |
| Michael Davis |          104 |     204 |
| Emily Clark   |          105 |     205 |
+---------------+--------------+---------+
5 rows in set (0.001 sec)
```

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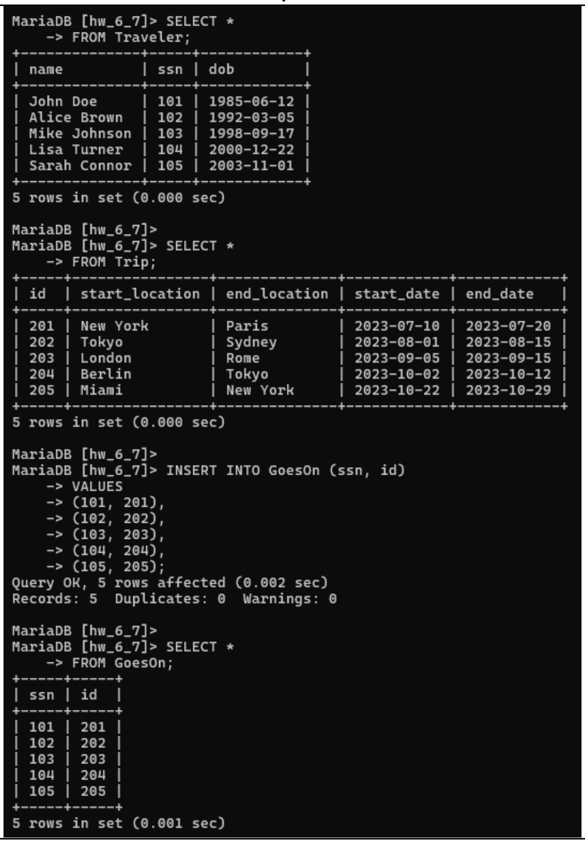
4. ** Inserts into ‘GoesOn’ **:

SQL Statements	SQL Implementation

SELECT *
FROM Traveler;
 	
SELECT *
FROM Trip;
 	
INSERT INTO GoesOn (ssn, id)
VALUES
(101, 201),
(102, 202),
(103, 203),
(104, 204),
(105, 205);
 	
SELECT *
FROM GoesOn;
	

```
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Alice Brown  | 102 | 1992-03-05 |
| Mike Johnson | 103 | 1998-09-17 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
+--------------+-----+------------+
5 rows in set (0.000 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Trip;
+-----+----------------+--------------+------------+------------+
| id  | start_location | end_location | start_date | end_date   |
+-----+----------------+--------------+------------+------------+
| 201 | New York       | Paris        | 2023-07-10 | 2023-07-20 |
| 202 | Tokyo          | Sydney       | 2023-08-01 | 2023-08-15 |
| 203 | London         | Rome         | 2023-09-05 | 2023-09-15 |
| 204 | Berlin         | Tokyo        | 2023-10-02 | 2023-10-12 |
| 205 | Miami          | New York     | 2023-10-22 | 2023-10-29 |
+-----+----------------+--------------+------------+------------+
5 rows in set (0.000 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> INSERT INTO GoesOn (ssn, id)
    -> VALUES
    -> (101, 201),
    -> (102, 202),
    -> (103, 203),
    -> (104, 204),
    -> (105, 205);
Query OK, 5 rows affected (0.002 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM GoesOn;
+-----+-----+
| ssn | id  |
+-----+-----+
| 101 | 201 |
| 102 | 202 |
| 103 | 203 |
| 104 | 204 |
| 105 | 205 |
+-----+-----+
5 rows in set (0.001 sec)
```

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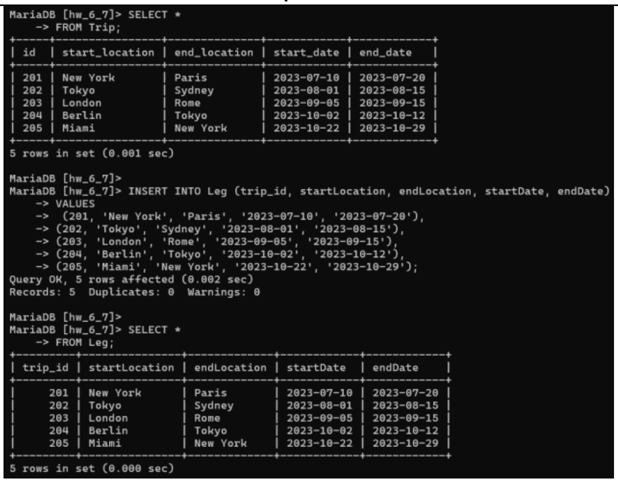
5. ** Insert into ‘Leg’ **:

SQL Statements	SQL Implementation

SELECT *
FROM Trip;
 	
INSERT INTO Leg (trip_id, startLocation, endLocation, startDate, endDate)
VALUES
 (201, 'New York', 'Paris', '2023-07-10', '2023-07-20'),
(202, 'Tokyo', 'Sydney', '2023-08-01', '2023-08-15'),
(203, 'London', 'Rome', '2023-09-05', '2023-09-15'),
(204, 'Berlin', 'Tokyo', '2023-10-02', '2023-10-12'),
(205, 'Miami', 'New York', '2023-10-22', '2023-10-29');
 	
SELECT *
FROM Leg;
	

```
MariaDB [hw_6_7]> SELECT *
    -> FROM Trip;
+-----+----------------+--------------+------------+------------+
| id  | start_location | end_location | start_date | end_date   |
+-----+----------------+--------------+------------+------------+
| 201 | New York       | Paris        | 2023-07-10 | 2023-07-20 |
| 202 | Tokyo          | Sydney       | 2023-08-01 | 2023-08-15 |
| 203 | London         | Rome         | 2023-09-05 | 2023-09-15 |
| 204 | Berlin         | Tokyo        | 2023-10-02 | 2023-10-12 |
| 205 | Miami          | New York     | 2023-10-22 | 2023-10-29 |
+-----+----------------+--------------+------------+------------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> INSERT INTO Leg (trip_id, startLocation, endLocation, startDate, endDate)
    -> VALUES
    ->  (201, 'New York', 'Paris', '2023-07-10', '2023-07-20'),
    -> (202, 'Tokyo', 'Sydney', '2023-08-01', '2023-08-15'),
    -> (203, 'London', 'Rome', '2023-09-05', '2023-09-15'),
    -> (204, 'Berlin', 'Tokyo', '2023-10-02', '2023-10-12'),
    -> (205, 'Miami', 'New York', '2023-10-22', '2023-10-29');
Query OK, 5 rows affected (0.002 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Leg;
+---------+---------------+-------------+------------+------------+
| trip_id | startLocation | endLocation | startDate  | endDate    |
+---------+---------------+-------------+------------+------------+
|     201 | New York      | Paris       | 2023-07-10 | 2023-07-20 |
|     202 | Tokyo         | Sydney      | 2023-08-01 | 2023-08-15 |
|     203 | London        | Rome        | 2023-09-05 | 2023-09-15 |
|     204 | Berlin        | Tokyo       | 2023-10-02 | 2023-10-12 |
|     205 | Miami         | New York    | 2023-10-22 | 2023-10-29 |
+---------+---------------+-------------+------------+------------+
5 rows in set (0.000 sec)
```

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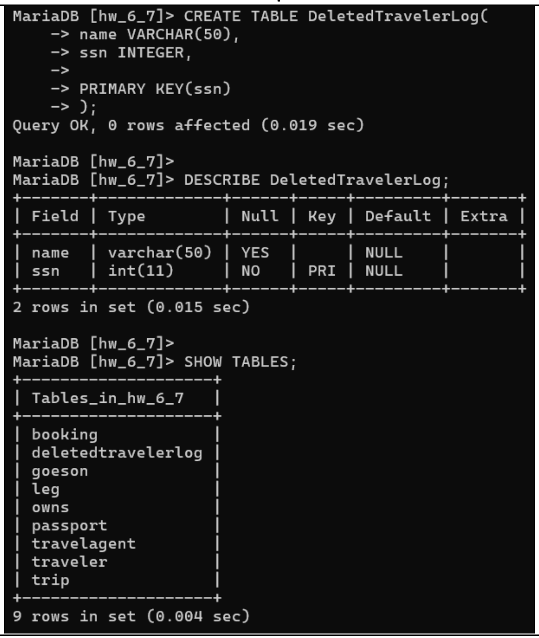
Part 4: Triggers

1. Trigger 1:
   a. First, create the DeletedTravelerLog table to store logs of deleted travelers. This table should include columns for name and ssn to record the details of each deleted traveler.

SQL Statements	SQL Implementation

CREATE TABLE DeletedTravelerLog(
    name VARCHAR(50),
    ssn INTEGER,
 	
    PRIMARY KEY(ssn)
);
 	
DESCRIBE DeletedTravelerLog;
 	
SHOW TABLES;
	

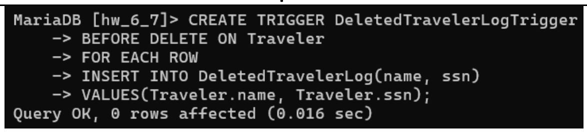
```
MariaDB [hw_6_7]> CREATE TABLE DeletedTravelerLog(
    -> name VARCHAR(50),
    -> ssn INTEGER,
    ->
    -> PRIMARY KEY(ssn)
    -> );
Query OK, 0 rows affected (0.019 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE DeletedTravelerLog;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| name  | varchar(50) | YES  |     | NULL    |       |
| ssn   | int(11)     | NO   | PRI | NULL    |       |
+-------+-------------+------+-----+---------+-------+
2 rows in set (0.015 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+--------------------+
| Tables_in_hw_6_7   |
+--------------------+
| booking            |
| deletedtravelerlog |
| goeson             |
| leg                |
| owns               |
| passport           |
| travelagent        |
| traveler           |
| trip               |
+--------------------+
9 rows in set (0.004 sec)
```

   b. Next, create a trigger on the Traveler table. Before a record is deleted, this trigger should log the name and ssn of the traveler to the DeletedTravelerLog table.

SQL Statements	SQL Implementation

CREATE TRIGGER DeletedTravelerLogTrigger
BEFORE DELETE ON Traveler
FOR EACH ROW
INSERT INTO DeletedTravelerLog(name, ssn)
VALUES(OLD.name, OLD.ssn);
	

```
MariaDB [hw_6_7]> CREATE TRIGGER DeletedTravelerLogTrigger
    -> BEFORE DELETE ON Traveler
    -> FOR EACH ROW
    -> INSERT INTO DeletedTravelerLog(name, ssn)
    -> VALUES(Traveler.name, Traveler.ssn);
Query OK, 0 rows affected (0.016 sec)
```

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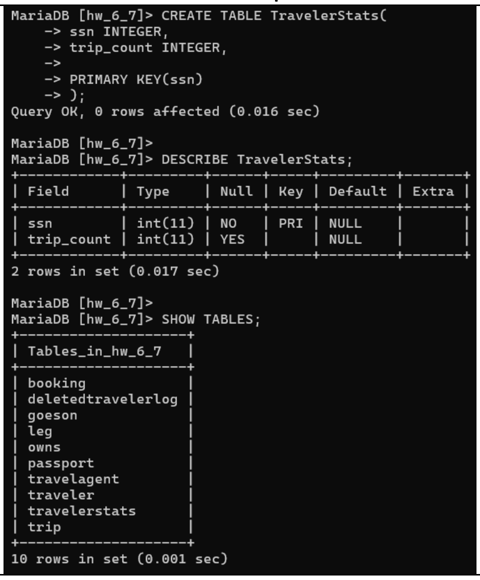
2. Trigger 2:
    a. First, create the TravelerStats table. This table should include a column for the traveler's ssn and a column for the total trip count to store the number of trips each traveler has taken.

SQL Statements	SQL Implementation

CREATE TABLE TravelerStats(
    ssn INTEGER,
    trip_count INTEGER DEFAULT 1,
 	
    PRIMARY KEY(ssn)
);
 	
DESCRIBE TravelerStats;
 	
SHOW TABLES;
	

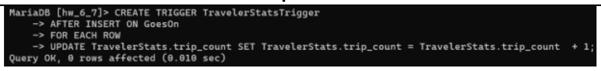
```
MariaDB [hw_6_7]> CREATE TABLE TravelerStats(
    -> ssn INTEGER,
    -> trip_count INTEGER,
    ->
    -> PRIMARY KEY(ssn)
    -> );
Query OK, 0 rows affected (0.016 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> DESCRIBE TravelerStats;
+------------+---------+------+-----+---------+-------+
| Field      | Type    | Null | Key | Default | Extra |
+------------+---------+------+-----+---------+-------+
| ssn        | int(11) | NO   | PRI | NULL    |       |
| trip_count | int(11) | YES  |     | NULL    |       |
+------------+---------+------+-----+---------+-------+
2 rows in set (0.017 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SHOW TABLES;
+--------------------+
| Tables_in_hw_6_7   |
+--------------------+
| booking            |
| deletedtravelerlog |
| goeson             |
| leg                |
| owns               |
| passport           |
| travelagent        |
| traveler           |
| travelerstats      |
| trip               |
+--------------------+
10 rows in set (0.001 sec)
```

    b. Next, create a trigger on the GoesOn table. After a new record is inserted into GoesOn, this trigger should update the trip count in the TravelerStats table for the traveler's ssn to reflect the total number of trips.

SQL Statements	SQL Implementation

CREATE TRIGGER TravelerStatsTrigger
AFTER INSERT ON GoesOn
FOR EACH ROW
INSERT INTO TravelerStats(ssn)
VALUES(NEW.ssn)
ON DUPLICATE KEY UPDATE
trip_count = trip_count + 1;
	

```
MariaDB [hw_6_7]> CREATE TRIGGER TravelerStatsTrigger
    -> AFTER INSERT ON GoesOn
    -> FOR EACH ROW
    -> UPDATE TravelerStats.trip_count SET TravelerStats.trip_count = TravelerStats.trip_count  + 1;
Query OK, 0 rows affected (0.010 sec)
```

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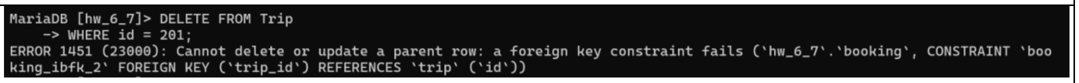
Part 5: Constraint Scenarios

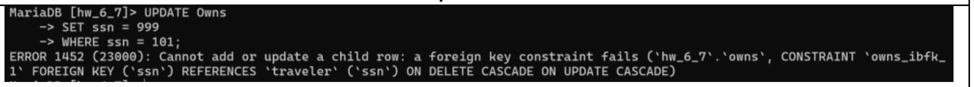
1. **Delete a Trip ID in Trip (3 points):** Attempt to delete a Trip entry where the id is 201. Observe and describe the violation that occurs due to the foreign key constraints.

SQL Statements	SQL Implementation
DELETE FROM Trip WHERE id = 201;	

```
MariaDB [hw_6_7]> DELETE FROM Trip
    -> WHERE id = 201;
ERROR 1451 (23000): Cannot delete or update a parent row: a foreign key constraint fails (`hw_6_7`.`booking`, CONSTRAINT `boo
king_ibfk_2` FOREIGN KEY (`trip_id`) REFERENCES `trip` (`id`))
```

The violation that occurs due to foreign key constraints is because there are multiple references to other child tables such as Booking, GoesOn, and Leg from which the parent table Trip references with no specification on how to handle deletions, so if there's no specification foreign keys will reject the command if the value is being referenced in a child table. In the specific command, it says that the constraint is from the Booking table which indicates that the data that is attempted to be deleted is 201 which is used in the child table Booking.

2. **Update an SSN in Owns (3 points):** Attempt to update the ssn in Owns that has the value 101 to 999. Describe the violation and explain how the foreign key constraint prevents this update.

SQL Statements	SQL Implementation
UPDATE Owns SET ssn = 999 WHERE ssn = 101;	

```
MariaDB [hw_6_7]> UPDATE Owns
    -> SET ssn = 999
    -> WHERE ssn = 101;
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails (`hw_6_7`.`owns`, CONSTRAINT `owns_ibfk_
1` FOREIGN KEY (`ssn`) REFERENCES `traveler` (`ssn`) ON DELETE CASCADE ON UPDATE CASCADE)
```

The foreign key violation is triggered because the foreign key ssn in the child table Owns is connected to the parent table Traveler(ssn) and it rejected because the update attempts to change the value on a child row, which it rejects because there is not an equivalent value that is already in the parent table Traveler.

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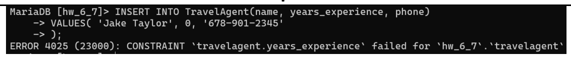
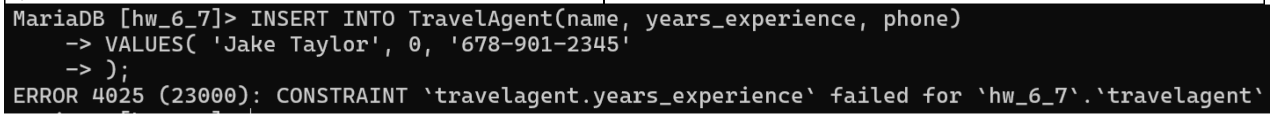
3. **Insert a Travel Agent with 0 Years of Experience (3 points):** Try to insert a new TravelAgent ('Jake Taylor', 0, '678-901-2345'). Describe the result and explain how the attribute-based constraint enforces data validity.

SQL Statements	SQL Implementation

INSERT INTO TravelAgent(name, years_experience, phone)
VALUES('Jake Taylor', 0, '678-901-2345'
);
	
	MariaDB [hw_6_7]> INSERT INTO TravelAgent(name, years_experience, phone)
	-> VALUES('Jake Taylor', 0, '678-901-2345'
	->);
	ERROR 4025 (23000): CONSTRAINT \`travelagent.years_experience\` failed for \`hw_6_7\`.\`travelagent\`

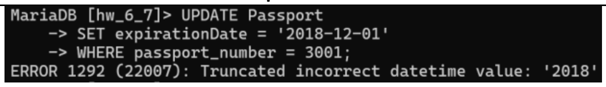


```
MariaDB [hw_6_7]> INSERT INTO TravelAgent(name, years_experience, phone)
    -> VALUES( 'Jake Taylor', 0, '678-901-2345'
    -> );
ERROR 4025 (23000): CONSTRAINT `travelagent.years_experience` failed for `hw_6_7`.`travelagent`
```

The insertion into TravelAgent fails because of the constraint CHECK(years_experience >= 1) on the TravelAgent table. This attribute based constraint enforces data validity because if a travel agent has no experience, there's a good chance they aren't a travel agent. It essentially insures that invalid or nonsensical data isn't stored. The error shows that it was due to the constraint travelagent.years_experience since it make sure there is a least 1 year od experience for each entry, but the attempt was for 0.

4. **Update Passport Expiration Date to an Invalid Date (3 points):** Attempt to update the Passport with the number 3001 to have an expiration date '2018-12- 01'. Describe the result and explain the purpose of the attribute-based constraint on expiration dates.

SQL Statements	SQL Implementation

UPDATE Passport
SET expirationDate = '2018-12-01'
WHERE passport_number = 3001;
	
	MariaDB [hw_6_7]> UPDATE Passport
	-> SET expirationDate = '2018-12-01'
	-> WHERE passport_number = 3001;
	ERROR 1292 (22007): Truncated incorrect datetime value: '2018'

The reason why the Update Failed is because of the Constraint CHECK(expirationDate > '2020-01-01'), this is important because it ensure only passports that are valid unexpired passports are being included in the data. The data in the error message said it was from the value 2018, which is less than the checked value 2020.

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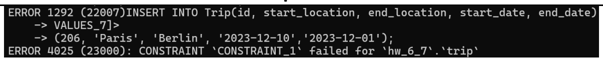
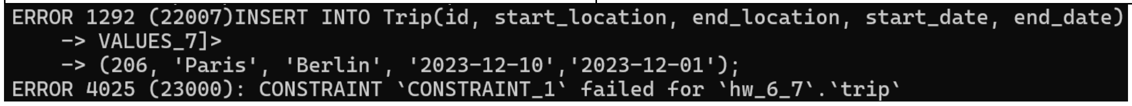
5. **Insert a Trip with an Invalid Date Range (3 points):** Try to insert a new Trip with the following values (206, ’Paris’, ’Berlin’, ’2023-12-10’, ’2023-12-01’). Describe the violation and explain how the tuple-based constraint ensures logical date ranges.

SQL Statements	SQL Implementation

INSERT INTO Trip(id, start_location, end_location, start_date, end_date) VALUES (206, 'Paris', 'Berlin', '2023-12-10','2023-12-01');	 `ERROR 1292 (22007)INSERT INTO Trip(id, start_location, end_location, start_date, end_date)`
	`    -> VALUES_7]>`
	`    -> (206, 'Paris', 'Berlin', '2023-12-10','2023-12-01');`
	``ERROR 4025 (23000): CONSTRAINT `CONSTRAINT_1` failed for `hw_6_7`.`trip` ``



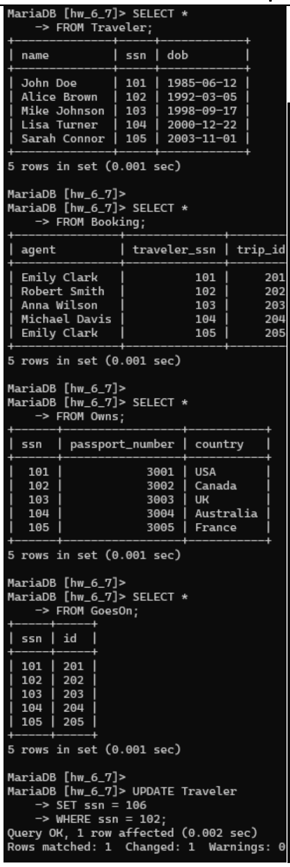
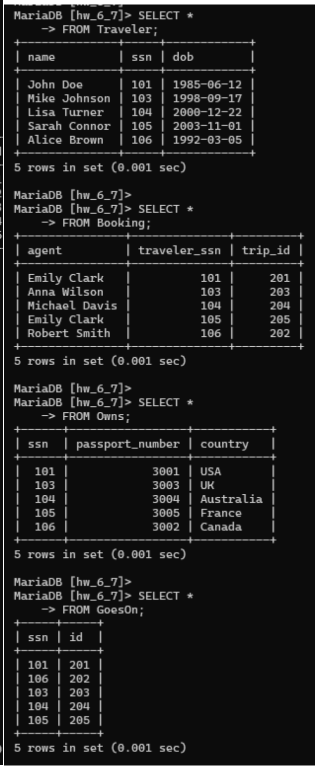
```
ERROR 1292 (22007)INSERT INTO Trip(id, start_location, end_location, start_date, end_date)
    -> VALUES_7]>
    -> (206, 'Paris', 'Berlin', '2023-12-10','2023-12-01');
ERROR 4025 (23000): CONSTRAINT `CONSTRAINT_1` failed for `hw_6_7`.`trip`
```

The violation occurred because of the constraint CHECK(end_date >= start_date) which indicates that the end date has to be after the start date, which makes sense because there’s no reason for a start date to be after an end date, so this can prevent nonsensical information from accidentally being entered.

Name: Natalie Poche
Assignment: Homework 6
Due: April 23, 2025

6. **Update a Traveler to Cascade Changes (3 points):** Update the ssn of Traveler 102 to have the value 106 and observe how the update cascades to the Booking , Owns and GoesOn tables. Describe the effect and explain how the cascade on update policy maintains referential integrity.

SQL Statements	SQL Implementation

SELECT *
FROM Traveler;
 	
SELECT *
FROM Booking;
 	
SELECT *
FROM Owns;
 	
SELECT *
FROM GoesOn;
 	
UPDATE Traveler
SET ssn = 106
WHERE ssn = 102;
 	
SELECT *
FROM Traveler;
 	
SELECT *
FROM Booking;
 	
SELECT *
FROM Owns;
 	
SELECT *
FROM GoesOn;
	 

```
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Alice Brown  | 102 | 1992-03-05 |
| Mike Johnson | 103 | 1998-09-17 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
+--------------+-----+------------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Booking;
+---------------+--------------+--------
| agent         | traveler_ssn | trip_id
+---------------+--------------+--------
| Emily Clark   |          101 |      201
| Robert Smith  |          102 |      202
| Anna Wilson   |          103 |      203
| Michael Davis |          104 |      204
| Emily Clark   |          105 |      205
+---------------+--------------+--------
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Owns;
+-----+-----------------+-----------+
| ssn | passport_number | country   |
+-----+-----------------+-----------+
| 101 |            3001 | USA       |
| 102 |            3002 | Canada    |
| 103 |            3003 | UK        |
| 104 |            3004 | Australia |
| 105 |            3005 | France    |
+-----+-----------------+-----------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM GoesOn;
+-----+-----+
| ssn | id  |
+-----+-----+
| 101 | 201 |
| 102 | 202 |
| 103 | 203 |
| 104 | 204 |
| 105 | 205 |
+-----+-----+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> UPDATE Traveler
    -> SET ssn = 106
    -> WHERE ssn = 102;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

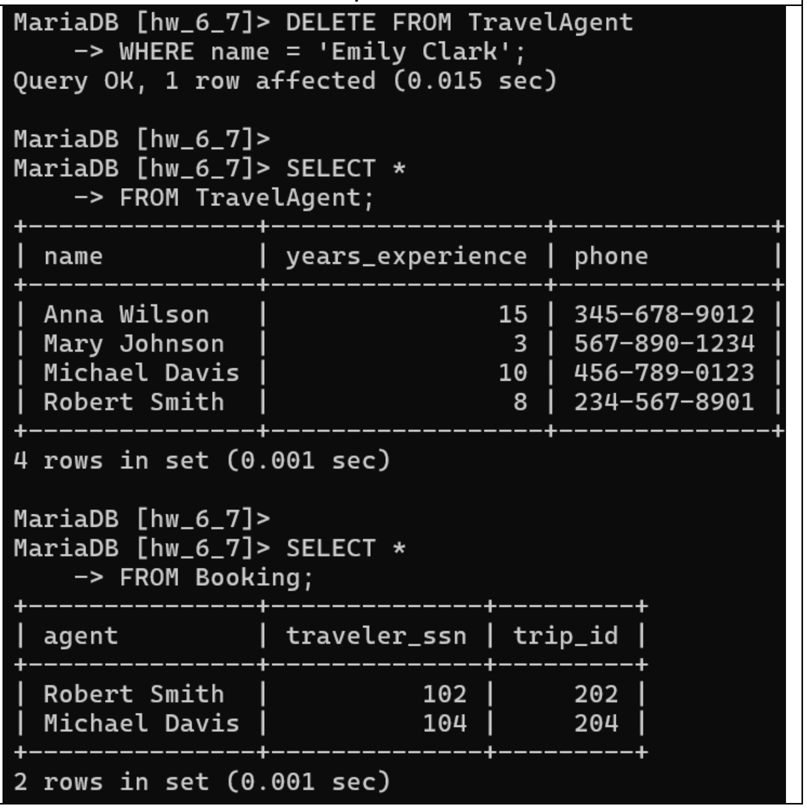
```
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Mike Johnson | 103 | 1998-09-17 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
| Alice Brown  | 106 | 1992-03-05 |
+--------------+-----+------------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Booking;
+---------------+--------------+---------+
| agent         | traveler_ssn | trip_id |
+---------------+--------------+---------+
| Emily Clark   |          101 |     201 |
| Anna Wilson   |          103 |     203 |
| Michael Davis |          104 |     204 |
| Emily Clark   |          105 |     205 |
| Robert Smith  |          106 |     202 |
+---------------+--------------+---------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Owns;
+-----+-----------------+-----------+
| ssn | passport_number | country   |
+-----+-----------------+-----------+
| 101 |            3001 | USA       |
| 103 |            3003 | UK        |
| 104 |            3004 | Australia |
| 105 |            3005 | France    |
| 106 |            3002 | Canada    |
+-----+-----------------+-----------+
5 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM GoesOn;
+-----+-----+
| ssn | id  |
+-----+-----+
| 101 | 201 |
| 106 | 202 |
| 103 | 203 |
| 104 | 204 |
| 105 | 205 |
+-----+-----+
5 rows in set (0.001 sec)
```

The CASCADE ON UPDATE policy maintains referential integrity as if there is an update in the parent table, such as an update to the ssn in Traveler, then the child tables that use Traveler.ssn as a foreign key for their own ssn values is automatically updated if the corresponding ssn value is referenced in that table. For example, by changing ssn from 102 to 106 in the parent table Traveler, the children tbales Booking, Owns, and GoesOn also changes the ssn value where 102 was previously referenced to 106.

Name: Natalie Poche
Assignment: Homework 6
Due: April 23, 2025

7. **Delete a Travel Agent to Cascade changes in Booking (3 points):** Delete the TravelAgent 'Emily Clark' and observe how the delete cascades to the Booking. Describe the effect and explain how the cascade on update policy maintains referential integrity.

SQL Statements	SQL Implementation

DELETE FROM TravelAgent
WHERE name = 'Emily Clark';
 	
SELECT *
FROM TravelAgent;
 	
SELECT *
FROM Booking;
	

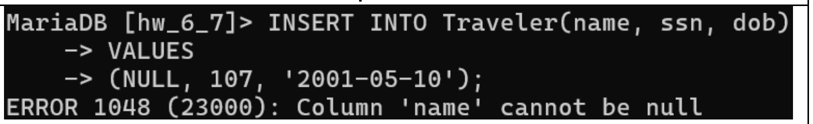
```
MariaDB [hw_6_7]> DELETE FROM TravelAgent
    -> WHERE name = 'Emily Clark';
Query OK, 1 row affected (0.015 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM TravelAgent;
+---------------+------------------+--------------+
| name          | years_experience | phone        |
+---------------+------------------+--------------+
| Anna Wilson   |               15 | 345-678-9012 |
| Mary Johnson  |                3 | 567-890-1234 |
| Michael Davis |               10 | 456-789-0123 |
| Robert Smith  |                8 | 234-567-8901 |
+---------------+------------------+--------------+
4 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Booking;
+---------------+--------------+---------+
| agent         | traveler_ssn | trip_id |
+---------------+--------------+---------+
| Robert Smith  |          102 |     202 |
| Michael Davis |          104 |     204 |
+---------------+--------------+---------+
2 rows in set (0.001 sec)
```

When deleting the name Emily Clark from the parent table TravelAgent, it automatically deletes all the rows that reference TravelAgent.name for their own agent name attributes, so the rows that previously held information with the agent Emily Clark are now deleted from the children tables as well as the parent table, so it maintains consistency as a foreign key so there are no references in the children tables for the foreign key for the agent name attribute that is not in the parent table in order to maintain referential integrity.

Name: Natalie Poche
Assignment: Homework 6
Due: April 23, 2025

8. **Insert a Traveler with a NULL Name (3 points):** Attempt to insert a Traveler with the following values (NULL, 107, ’2001-05-10’) to test the NOT NULL constraint. Describe the result and explain why a NOT NULL constraint is important for certain fields.

SQL Statements	SQL Implementation

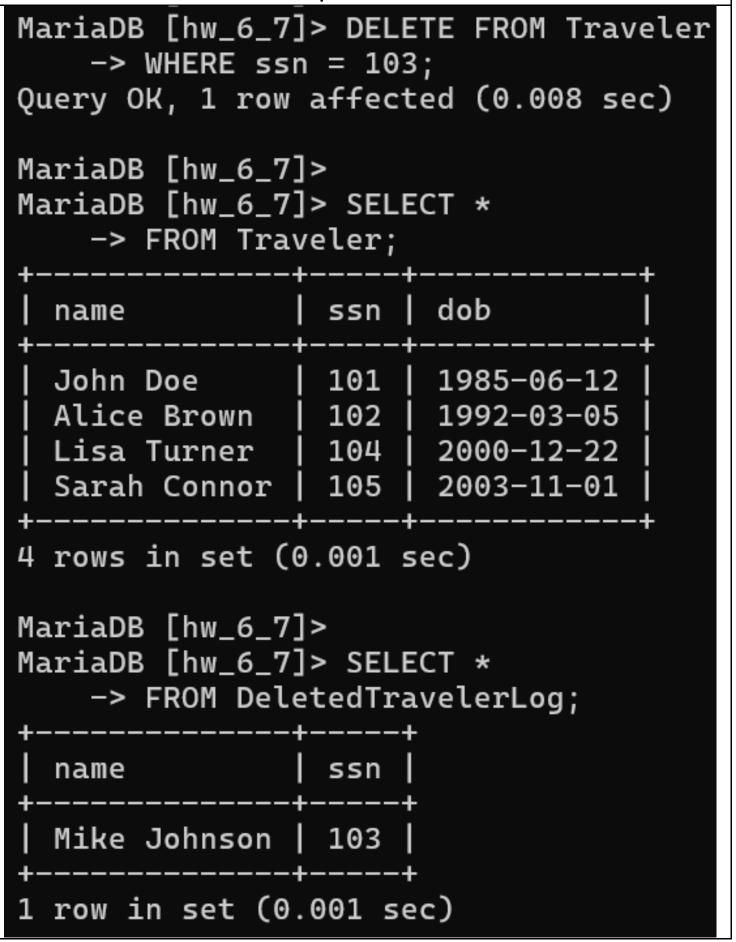
INSERT INTO Traveler(name, ssn, dob)
VALUES
(NULL, 107, '2001-05-10');
	
	MariaDB [hw_6_7]> INSERT INTO Traveler(name, ssn, dob)
	    -> VALUES
	    -> (NULL, 107, '2001-05-10');
	ERROR 1048 (23000): Column 'name' cannot be null

As the result of trying to insert a value in the Traveler Table that has NULL in the name it creates the error that name cannot be null, which make sense because in the Traveler creation there was a specification for name to be NOT NULL. NOT NULL is important for certain fields because it enforces data validity, for this scenario specifically, it wouldn’t make sense for a travler to have no name but they have a social security number and date of birth which is much more sensitive information than a name.

Name: Natalie Poche
Assignment: Homework 6
Due: April 23, 2025

9. **Trigger 1: Deletion of Traveler (3 points):** Delete a Traveler with ssn 103 and verify that the trigger logs the deleted traveler's name and ssn to the DeletedTravelerLog table. Describe the effect of the trigger.

SQL Statements	SQL Implementation

SELECT *
FROM Traveler;
 	
DELETE FROM Traveler
WHERE ssn = 103;
 	
SELECT *
FROM Traveler;
 	
SELECT *
FROM DeletedTravelerLog;
	

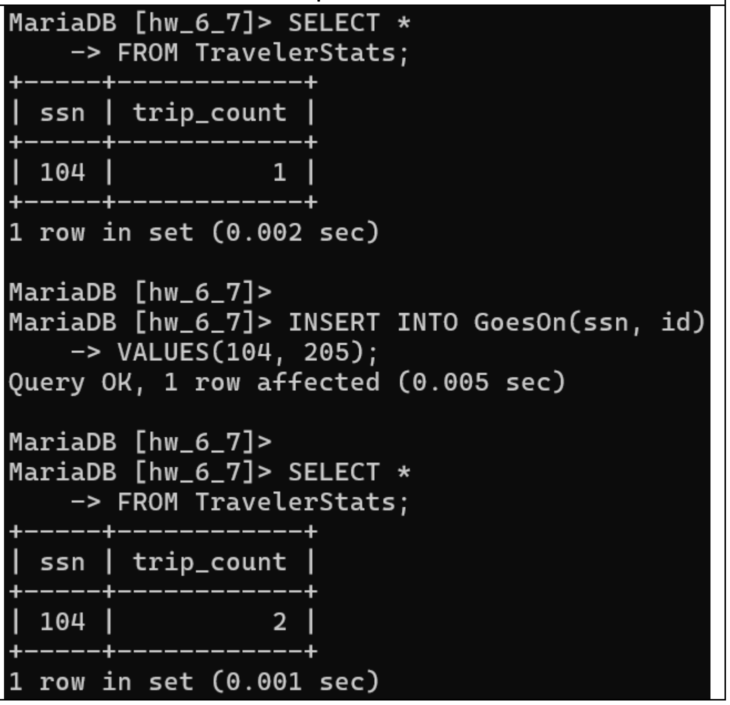
```
MariaDB [hw_6_7]> DELETE FROM Traveler
    -> WHERE ssn = 103;
Query OK, 1 row affected (0.008 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM Traveler;
+--------------+-----+------------+
| name         | ssn | dob        |
+--------------+-----+------------+
| John Doe     | 101 | 1985-06-12 |
| Alice Brown  | 102 | 1992-03-05 |
| Lisa Turner  | 104 | 2000-12-22 |
| Sarah Connor | 105 | 2003-11-01 |
+--------------+-----+------------+
4 rows in set (0.001 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM DeletedTravelerLog;
+--------------+-----+
| name         | ssn |
+--------------+-----+
| Mike Johnson | 103 |
+--------------+-----+
1 row in set (0.001 sec)
```

Due to the trigger, when the person with the ssn 103 is deleted from the Traveler table as instructed, but the added result of a trigger automates the process of adding the name and social security number of the deleted row to be added to a DeletedTravelerLog table.

Name: Natalie Poche
Assignment: Homework 6
Due: April 23, 2025

10. **Trigger 2: Insert into GoesOn to Update TravelerStats (3 points):** Insert a new record with the values (104, 205) into GoesOn and check the TravelerStats table to confirm the trip count updates as expected. Describe the result and explain how the trigger maintains the TravelerStats table

SQL Statements	SQL Implementation

INSERT INTO GoesOn(ssn, id)
VALUES(104, 204);
 	
SELECT *
FROM TravelerStats;
 	
INSERT INTO GoesOn(ssn, id)
VALUES(104, 205);
 	
SELECT *
FROM TravelerStats;
	

```
MariaDB [hw_6_7]> SELECT *
    -> FROM TravelerStats;
+-----+------------+
| ssn | trip_count |
+-----+------------+
| 104 |          1 |
+-----+------------+
1 row in set (0.002 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> INSERT INTO GoesOn(ssn, id)
    -> VALUES(104, 205);
Query OK, 1 row affected (0.005 sec)

MariaDB [hw_6_7]>
MariaDB [hw_6_7]> SELECT *
    -> FROM TravelerStats;
+-----+------------+
| ssn | trip_count |
+-----+------------+
| 104 |          2 |
+-----+------------+
1 row in set (0.001 sec)
```

The when values are inserted into goes in, under the assumption that there is already a duplicated value in the TravelerStats table, when there is a value entered into the GoesOn table. I inserted the values for GoesOn(ssn, id) with (104, 204) to mimic the first time the ssn 104 with trip is being entered in order for TravelerStats to be set to 1 for the trip count, and then added the example trip (104, 205) for it to count another trip and bring the TravlerStats.trip_count added to 2 when values are inserted into GoesOn.