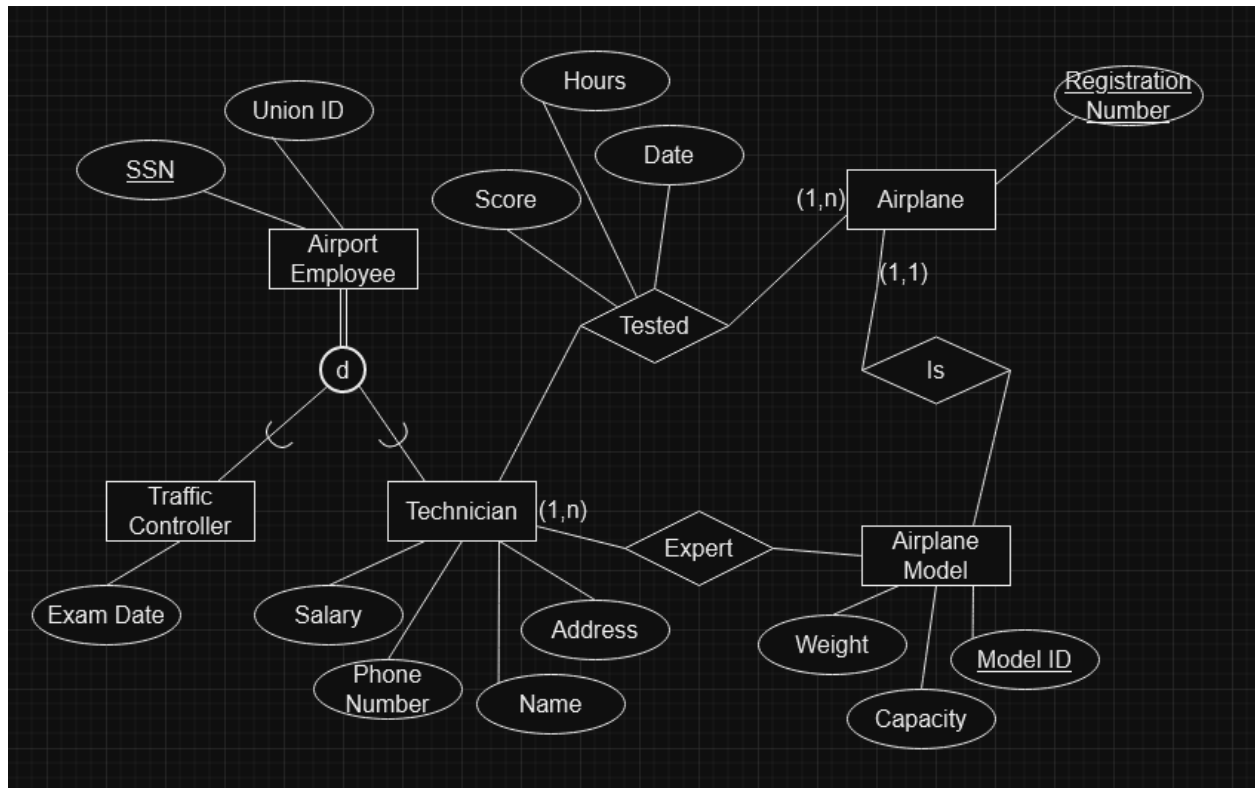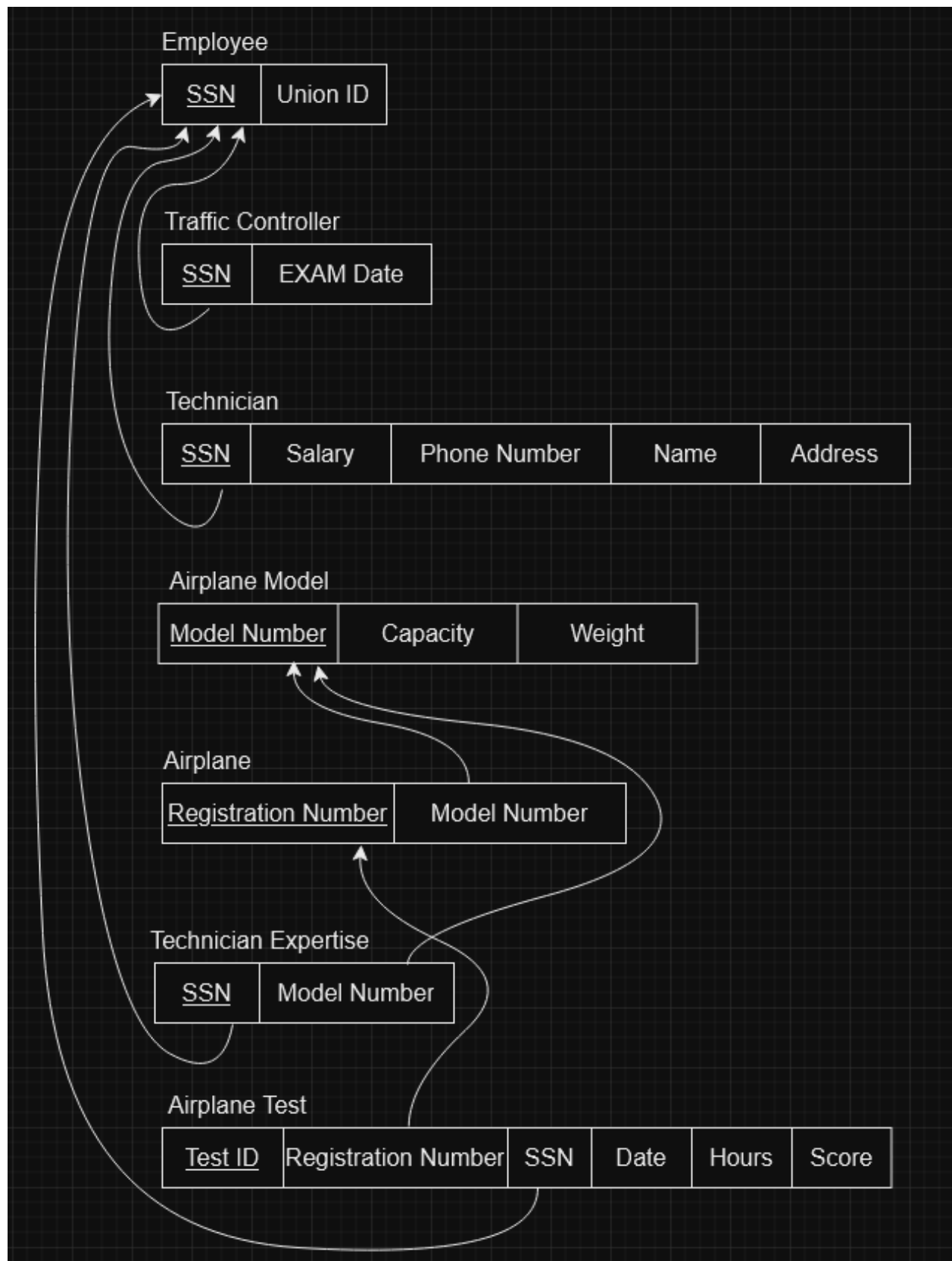# _Airport Database Project_

Brian Tang

ER Diagram

Assumptions:
1. The registration number and model ID are unique.
2. Each plane is tested at least once by any technician.
3. There could be no plane at the airport that matches a model.

Database Schema Diagram

Employee

SSN	Union ID

Traffic Controller

SSN	EXAM Date

Technician

SSN	Salary	Phone Number	Name	Address

Airplane Model

Model Number	Capacity	Weight

Airplane

Registration Number	Model Number

Technician Expertise

SSN	Model Number

Airplane Test

Test ID	Registration Number	SSN	Date	Hours	Score

SQL Tables

```sql
CREATE TABLE Employee (
    SSN VARCHAR(15) PRIMARY KEY,
    UnionMembershipNumber VARCHAR(20) NOT NULL
);

CREATE TABLE Technician (
    SSN VARCHAR(15) PRIMARY KEY,
    Name VARCHAR(50) NOT NULL,
    Address VARCHAR(100),
    PhoneNumber VARCHAR(15),
    Salary DECIMAL(10, 2),
    FOREIGN KEY (SSN) REFERENCES Employee(SSN) ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE TrafficController (
    SSN VARCHAR(15) PRIMARY KEY,
    LastMedicalExam DATE,
    FOREIGN KEY (SSN) REFERENCES Employee(SSN) ON DELETE CASCADE ON
UPDATE
    CASCADE
);

CREATE TABLE AirplaneModel (
    ModelNumber VARCHAR(20) PRIMARY KEY,
    Capacity INT,
    Weight INT
);

CREATE TABLE Airplane (
    RegistrationNumber VARCHAR(20) PRIMARY KEY,
    ModelNumber VARCHAR(20),
    FOREIGN KEY (ModelNumber) REFERENCES AirplaneModel(ModelNumber) ON
DELETE
    CASCADE ON UPDATE CASCADE
);
```

```sql
CREATE TABLE TechnicianExpertise (
    SSN VARCHAR(15),
    ModelNumber VARCHAR(20),
    PRIMARY KEY (SSN, ModelNumber),
    FOREIGN KEY (SSN) REFERENCES Technician(SSN) ON DELETE CASCADE ON UPDATE
    CASCADE,
    FOREIGN KEY (ModelNumber) REFERENCES AirplaneModel(ModelNumber)  ON DELETE
    CASCADE ON UPDATE CASCADE
);

CREATE TABLE AirplaneTest (
    TestID INT PRIMARY KEY,
    RegistrationNumber VARCHAR(20),
    TechnicianSSN VARCHAR(15),
    TestDate DATE,
    HoursSpent INT,
    Score INT,
    FOREIGN KEY (RegistrationNumber) REFERENCES Airplane(RegistrationNumber) ON DELETE
    CASCADE ON UPDATE CASCADE,
    FOREIGN KEY (TechnicianSSN) REFERENCES Technician(SSN) ON DELETE CASCADE ON
    UPDATE CASCADE
);
```

Functions:

model_experts():
DECLARE
   num_experts INT;
BEGIN
   SELECT COUNT(*) INTO num_experts
   FROM TechnicianExpertise
   WHERE ModelNumber = model_num;
   RETURN num_experts;
END;

Airplane_tests():
BEGIN
   RETURN QUERY
   SELECT T.SSN AS TechnicianSSN, T.Name AS TechnicianName
   FROM AirplaneTest AT
   JOIN Technician T ON AT.TechnicianSSN = T.SSN
   WHERE AT.RegistrationNumber = p_registration_num;
END;

Triggers:

```
test_restrict_trigger_function():
DECLARE
    test_count INT;
BEGIN
    SELECT COUNT(*) INTO test_count
    FROM AirplaneTest
    WHERE TechnicianSSN = NEW.TechnicianSSN;

    IF test_count >= 3 THEN
        RAISE EXCEPTION 'Technician can test no more than 3 airplanes.';
    END IF;

    RETURN NEW;
END;

CREATE TRIGGER test_restrict
BEFORE INSERT ON airplanetest
FOR EACH ROW
EXECUTE procedure test_restrict_trigger_function();

remove_model_trigger_function():
BEGIN
    DELETE FROM AirplaneModel
    WHERE ModelNumber = OLD.ModelNumber
      AND NOT EXISTS (
        SELECT 1
        FROM Airplane
        WHERE ModelNumber = OLD.ModelNumber
      );

    RETURN OLD;
END;

CREATE TRIGGER remove_model
AFTER DELETE ON Airplane
FOR EACH ROW
EXECUTE PROCEDURE remove_model_trigger_function();
```