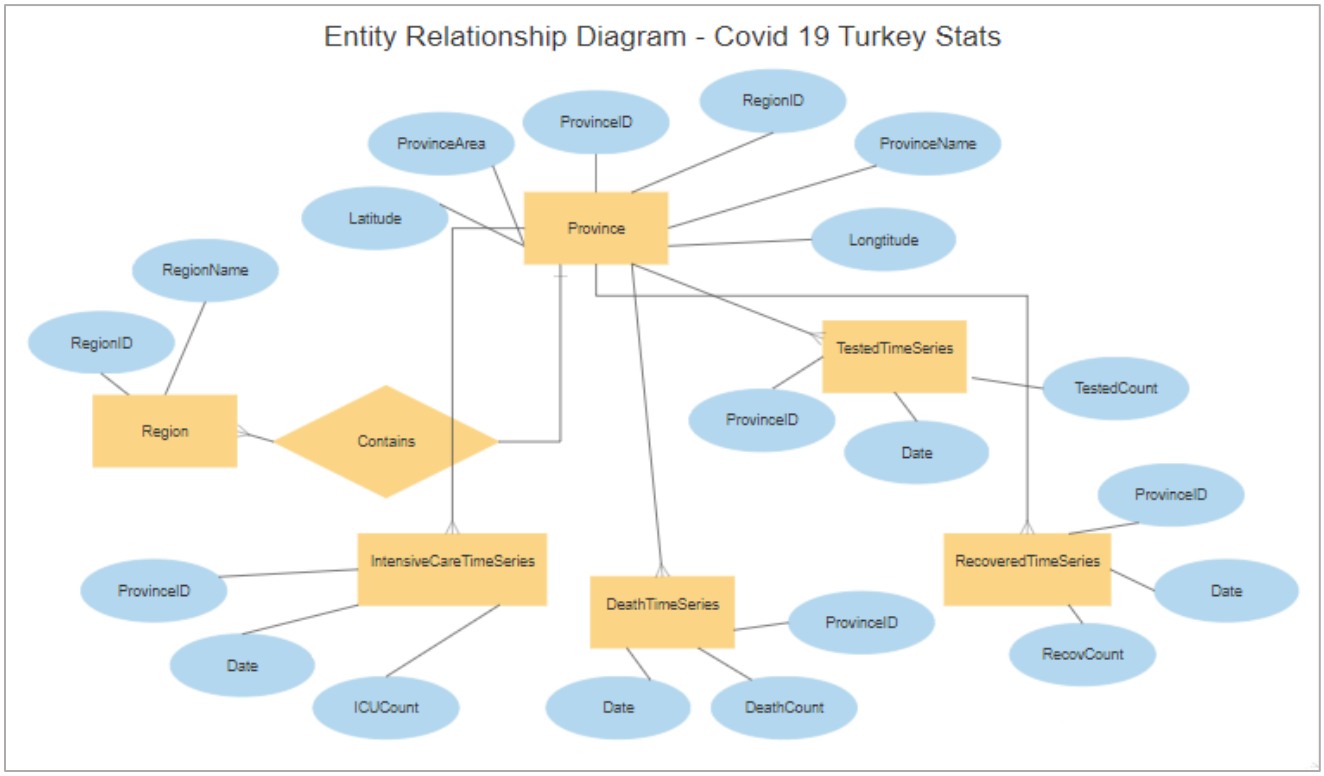
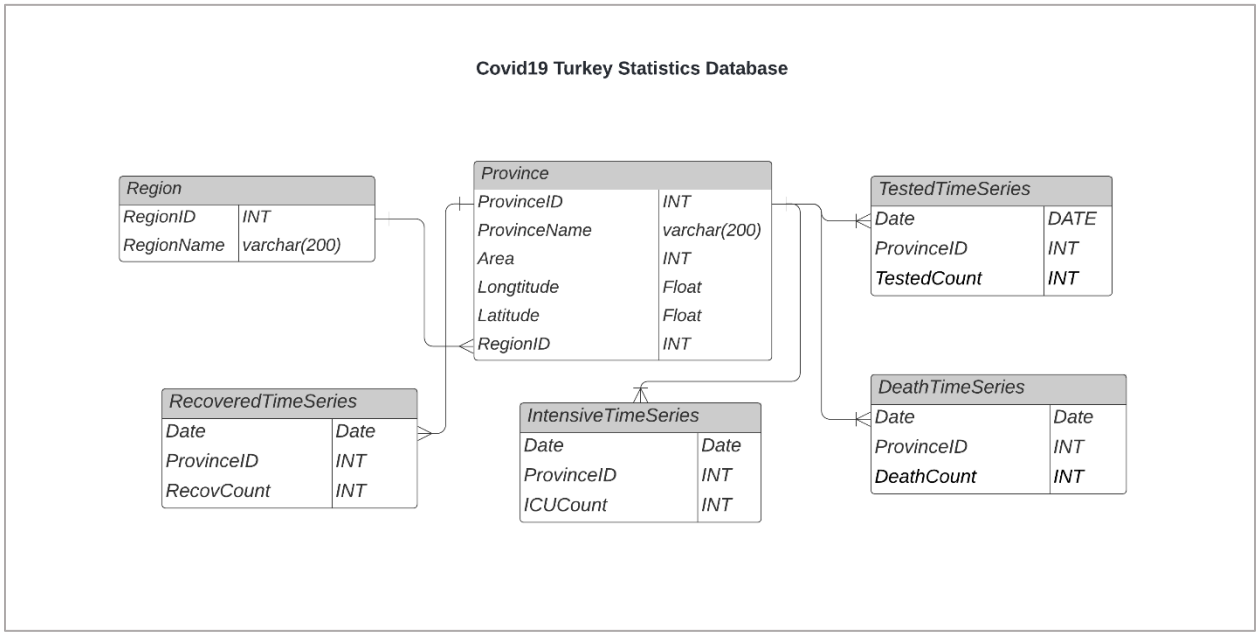
Design an E-R diagram based on your project topic.



Draw a database schema diagram according to your E-R design. Ensure that every relation satisfies at least Boyce-Codd normal form.



Write necessary CREATE TABLE statements (including constraint definitions) for all relations in your schema.

```
CREATE DATABASE IF NOT EXISTS CovidTurkey;
-- To show that database was created --
SHOW DATABASES;

-- create players table
USE CovidTurkey;
CREATE TABLE TestedTimeSeries (
Dates date,
ProvinceID INT,
TestCount INT
);
CREATE TABLE RecoveredTimeSeries (
Dates date,
ProvinceID INT,
RecovCount INT
);
CREATE TABLE DeathsTimeSeries (
Dates date,
ProvinceID INT,
DeathCount INT
);
CREATE TABLE IntensiveCareTimeSeries (
Dates date,
ProvinceID INT,
ICUCount INT
);
CREATE TABLE Province (
ProvinceID INT NOT NULL primary key,
ProvinceName varchar (200),
ProvinceArea INT,
Latitude float,
Longtitude float
);
CREATE TABLE Region (
RegionID INT NOT NULL primary key,
RegionName varchar (200)
);

USE CovidTurkey;

SHOW TABLES;
```

Write 3 different INSERT INTO statements for each of your tables.

```
--Insert into Region--
INSERT INTO Region VALUES
(001, 'Akdeniz'), (002, 'Doguc'), (003,'Ege'), (004,'Guney Dogu Anadolu'),(005,'Ic Anadolu'),
(006,'Karadeniz'),(007,'Marmara');

-- Insert into Province ---
INSERT INTO Province VALUES
(123,'Adana',1,13844,37,35.32133300),
(124,'Adiyaman',4,7337,37.764751,38.278561),
(125,'Afyonkarahisar',3,14016,38.750714,30.556692);

-- Insert into TestedTimeSeries --
INSERT INTO TestedTimeSeries VALUES
('2020-02-04',123,600),('2020-02-04',126,300),('2020-02-03',125,100);

-- Insert into DeathsTimeSeries --
INSERT INTO DeathsTimeSeries VALUES
('2020-02-05',123,1600),('2020-02-04',126,1900),('2020-04-03',125,1100);

-- Insert into RecoveredTimeSeries --
INSERT INTO RecoveredTimeSeries VALUES
('2020-02-03',123,20),('2020-02-04',126,100),('2020-02-03',125,50);

-- Insert into IntensiveCareTimeSeries --
INSERT INTO IntensiveCareTimeSeries VALUES
('2020-02-04',123,100),('2020-02-04',126,30),('2020-02-03',125,200);
```

Write 9 different SQL queries with their descriptions for the database you created. You must write the queries based on the specified approaches below:

- 3 Joins

- Inner join to retrieve region name with province information

```
SELECT p.ProvinceID, p.ProvinceName, p.ProvinceArea, r.RegionName
FROM Province p
INNER JOIN Region r
ON p.RegionID = r.RegionID
```

- Retrieve provinces that do not have any data available

```
SELECT t.Dates, t.TestCount, p.ProvinceName
FROM Province p
LEFT JOIN TestedTimeSeries t
ON t.ProvinceID = p.ProvinceID
WHERE t.TestCount IS NULL;
```

- Retrieve sum of recovered patient for each region

```
SELECT r.RegionID, Sum(re.RecovCount), r.RegionName, p.ProvinceName
FROM Region r INNER JOIN Province p ON p.RegionID = r.RegionID
INNER JOIN RecoveredTimeSeries re ON re.ProvinceID = p.ProvinceID
GROUP BY r.RegionID, r.RegionName, p.ProvinceName
```

- 2 Nested Queries

- Find count of a province in a region based on region's name

```
SELECT COUNT(ProvinceID) FROM Province WHERE RegionID IN
(SELECT RegionID FROM Region WHERE RegionName = 'Ic Anadolu');
```

- Find provinces for which cumulative death count is greater than 200

```
SELECT ProvinceID, RegionID, ProvinceName from Province
WHERE ProvinceID IN
(SELECT p.ProvinceID FROM Province p INNER JOIN DeathsTimeSeries d
ON p.ProvinceID = d.ProvinceID
HAVING SUM(d.DeathCount) > 200)
```

- 2 Set Operations

■ Find the dates and provinces for which both recovery and ICU data is available

```
SELECT Dates, ProvinceID FROM IntensiveCareTimeSeries
UNION
SELECT Dates, ProvinceID FROM RecoveredTimeSeries
```

■ SELECT all the values from ICU and Death

```
SELECT Dates, ICUCOUNT as COUNT FROM IntensiveCareTimeSeries
UNION ALL SELECT DATES, DeathCOUNT as COUNT FROM DeathsTimeSeries;
```

- 2 Aggregate Operations

■ Average tests done in each province

```
SELECT AVG(TestCount) FROM TestedTimeSeries
GROUP BY ProvinceID
```

■ Maximum cases recovered on any day for a specific province

```
SELECT MAX(RecovCount), ProvinceID FROM RecoveredTimeSeries
GROUP BY   ProvinceID
```