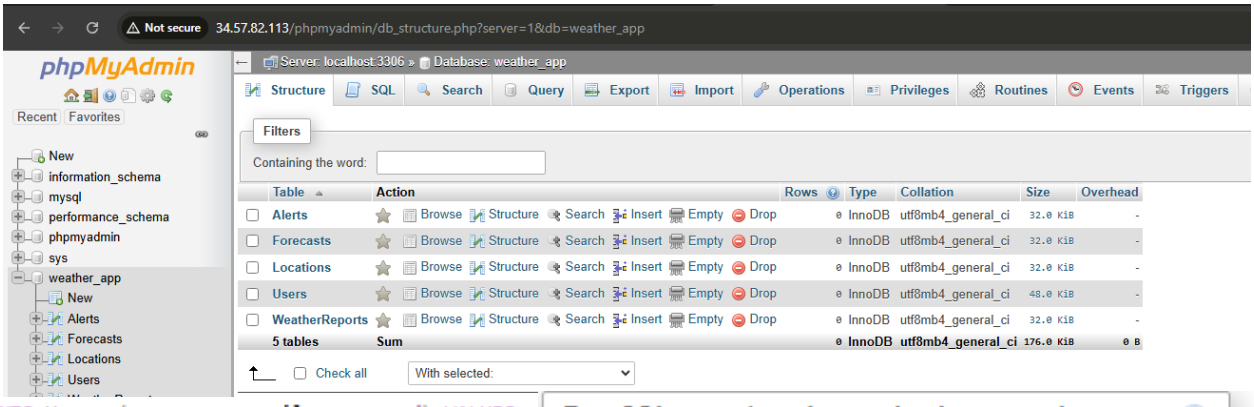
Thomas Hoerger

Project 1

2/24/2025

1. Define your database topic: have at least 5 tables with 30 records for each table:




```
INSERT INTO Users (username, email, password) VALUES
('john_doe', 'john@example.com', 'pass123'),
('alice_smith', 'alice@example.com', 'pass456'),
('bob_jones', 'bob@example.com', 'pass789'),
('charlie_adams', 'charlie@example.com', 'pass234'),
('david_lee', 'david@example.com', 'pass567'),
('emma_watson', 'emma@example.com', 'pass890'),
('frank_miller', 'frank@example.com', 'pass345'),
('grace_hill', 'grace@example.com', 'pass678'),
('henry_clark', 'henry@example.com', 'pass901'),
('isabel_roberts', 'isabel@example.com', 'pass012'),
('jason_moore', 'jason@example.com', 'pass123'),
('karen_white', 'karen@example.com', 'pass456'),
('lucas_johnson', 'lucas@example.com', 'pass789'),
('maria_wilson', 'maria@example.com', 'pass234'),
('nathan_brown', 'nathan@example.com', 'pass567'),
('olivia_davis', 'olivia@example.com', 'pass890'),
('paul_anderson', 'paul@example.com', 'pass345'),
('quincy_evans', 'quincy@example.com', 'pass678'),
('rachel_harris', 'rachel@example.com', 'pass901'),
('samuel_clark', 'samuel@example.com', 'pass012'),
('tina_green', 'tina@example.com', 'pass123'),
('ursula_hall', 'ursula@example.com', 'pass456'),
('victor_james', 'victor@example.com', 'pass789'),
('wendy_kim', 'wendy@example.com', 'pass234'),
('xander_lopez', 'xander@example.com', 'pass567'),
('yvonne_martin', 'yvonne@example.com', 'pass890'),
('zack_nelson', 'zack@example.com', 'pass345'),
('leo_perez', 'leo@example.com', 'pass678'),
('mia_quinn', 'mia@example.com', 'pass901'),
('noah_reed', 'noah@example.com', 'pass012');
```

Run SQL query/queries on database weather_app:

```
INSERT INTO Locations (city, country, latitude, longitude) VALUES
('New York', 'USA', 40.7128, -74.0060),
('Los Angeles', 'USA', 34.0522, -118.2437),
('Chicago', 'USA', 41.8781, -87.6298),
('Houston', 'USA', 29.7604, -95.3698),
('Phoenix', 'USA', 33.4484, -112.0740),
('Philadelphia', 'USA', 39.9526, -75.1652),
('San Antonio', 'USA', 29.4241, -98.4936),
('San Diego', 'USA', 32.7157, -117.1611),
('Dallas', 'USA', 32.7767, -96.7970),
('San Jose', 'USA', 37.3382, -121.8863),
('Toronto', 'Canada', 43.6532, -79.3832),
('Vancouver', 'Canada', 49.2827, -123.1207),
('Montreal', 'Canada', 45.5017, -73.5673),
('Mexico City', 'Mexico', 19.4326, -99.1332),
('London', 'UK', 51.5074, -0.1278),
('Manchester', 'UK', 53.4808, -2.2426),
('Paris', 'France', 48.8566, 2.3522),
('Berlin', 'Germany', 52.5200, 13.4050),
('Madrid', 'Spain', 40.4168, -3.7038),
('Rome', 'Italy', 41.9028, 12.4964),
('Tokyo', 'Japan', 35.6895, 139.6917),
('Osaka', 'Japan', 34.6937, 135.5023),
('Seoul', 'South Korea', 37.5665, 126.9780),
('Beijing', 'China', 39.9042, 116.4074),
('Sydney', 'Australia', -33.8688, 151.2093),
('Melbourne', 'Australia', -37.8136, 144.9631),
('Dubai', 'UAE', 25.276987, 55.296249),
('Moscow', 'Russia', 55.7558, 37.6173),
('Minneapolis', 'USA', 44.9778, -93.2650),
('Saint Cloud', 'USA', 45.5602, -94.1621);
```

```sql
INSERT INTO WeatherReports (location_id, temperature, humidity, wind_speed, weather_condition) VALUES
(1, 25.3, 60, 12.5, 'Sunny'),
(2, 30.1, 55, 8.2, 'Cloudy'),
(3, 22.4, 70, 5.6, 'Rainy'),
(4, 18.9, 80, 3.3, 'Stormy'),
(5, 27.2, 50, 9.8, 'Sunny'),
(6, 15.6, 90, 20.0, 'Snowy'),
(7, 35.4, 40, 7.5, 'Sunny'),
(8, 21.0, 65, 6.3, 'Cloudy'),
(9, 19.5, 75, 11.0, 'Rainy'),
(10, 24.8, 60, 10.5, 'Sunny'),
(11, 28.1, 50, 9.2, 'Clear'),
(12, 12.4, 85, 4.8, 'Snowy'),
(13, 29.0, 45, 6.7, 'Hot'),
(14, 33.6, 30, 5.5, 'Sunny'),
(15, 10.2, 92, 3.9, 'Foggy'),
(16, 14.5, 88, 4.3, 'Rainy'),
(17, 31.2, 35, 8.0, 'Sunny'),
(18, 26.8, 60, 6.5, 'Cloudy'),
(19, 22.1, 75, 7.1, 'Rainy'),
(20, 20.5, 80, 4.4, 'Stormy'),
(21, 16.7, 85, 12.0, 'Snowy'),
(22, 34.2, 40, 5.8, 'Sunny'),
(23, 29.5, 45, 10.1, 'Cloudy'),
(24, 18.3, 90, 4.9, 'Rainy'),
(25, 24.1, 55, 8.9, 'Clear'),
(26, 27.6, 50, 11.3, 'Hot'),
(27, 14.8, 93, 3.7, 'Foggy'),
(28, 32.4, 35, 9.7, 'Sunny'),
(29, 19.0, 70, 6.0, 'Cloudy'),
(30, 23.7, 65, 7.4, 'Rainy');
```

```sql
INSERT INTO Forecasts (location_id, forecast_date, expected_temp, expected_condition) VALUES
(1, '2025-02-25', 27.0, 'Sunny'),
(2, '2025-02-26', 31.5, 'Cloudy'),
(3, '2025-02-27', 23.0, 'Rainy'),
(4, '2025-02-28', 19.5, 'Stormy'),
(5, '2025-03-01', 28.0, 'Sunny'),
(6, '2025-03-02', 16.0, 'Snowy'),
(7, '2025-03-03', 36.0, 'Sunny'),
(8, '2025-03-04', 22.0, 'Cloudy'),
(9, '2025-03-05', 20.0, 'Rainy'),
(10, '2025-03-06', 25.0, 'Sunny'),
(11, '2025-03-07', 29.0, 'Clear'),
(12, '2025-03-08', 13.0, 'Snowy'),
(13, '2025-03-09', 30.0, 'Hot'),
(14, '2025-03-10', 34.0, 'Sunny'),
(15, '2025-03-11', 11.0, 'Foggy'),
(16, '2025-03-12', 15.0, 'Rainy'),
(17, '2025-03-13', 32.0, 'Sunny'),
(18, '2025-03-14', 27.0, 'Cloudy'),
(19, '2025-03-15', 23.0, 'Rainy'),
(20, '2025-03-16', 21.0, 'Stormy'),
(21, '2025-03-17', 17.0, 'Snowy'),
(22, '2025-03-18', 35.0, 'Sunny'),
(23, '2025-03-19', 30.0, 'Cloudy'),
(24, '2025-03-20', 19.0, 'Rainy'),
(25, '2025-03-21', 25.0, 'Clear'),
(26, '2025-03-22', 28.0, 'Hot'),
(27, '2025-03-23', 15.0, 'Foggy'),
(28, '2025-03-24', 33.0, 'Sunny'),
(29, '2025-03-25', 20.0, 'Cloudy'),
(30, '2025-03-26', 24.0, 'Rainy');
```

```sql
INSERT INTO Alerts (location_id, alert_message, alert_level, issued_at) VALUES
(1, 'Heat Advisory: Temperatures expected to reach 95°F. Stay hydrated.', 'Severe', '2025-02-20 10:00:00'),
(2, 'Air Quality Alert: High levels of ozone detected. Limit outdoor activities.', 'Moderate', '2025-02-21
09:00:00'),
(3, 'Flood Watch: Heavy rainfall expected. Be prepared for possible flooding.', 'Severe', '2025-02-22
08:30:00'),
(4, 'Hurricane Warning: Category 2 hurricane approaching. Evacuate if advised.', 'Extreme', '2025-02-23
07:45:00'),
(5, 'Excessive Heat Warning: Heat index values up to 110°F.', 'Severe', '2025-02-24 11:00:00'),
(6, 'Winter Storm Watch: Significant snowfall and ice accumulation possible.', 'Moderate', '2025-02-25
12:15:00'),
(7, 'Tornado Watch: Conditions favorable for tornado development.', 'Severe', '2025-02-26 13:00:00'),
(8, 'High Wind Warning: Sustained winds of 40 mph with gusts up to 60 mph.', 'Severe', '2025-02-27
14:30:00'),
(9, 'Flash Flood Warning: Rapid flooding imminent. Seek higher ground immediately.', 'Extreme', '2025-02-28
15:45:00'),
(10, 'Frost Advisory: Temperatures expected to drop to 32°F overnight.', 'Moderate', '2025-03-01
16:00:00'),
(11, 'Dense Fog Advisory: Visibility reduced to 1/4 mile or less.', 'Moderate', '2025-03-02 17:30:00'),
(12, 'Severe Thunderstorm Warning: Expect damaging winds and large hail.', 'Severe', '2025-03-03
18:45:00'),
(13, 'Blizzard Warning: Whiteout conditions expected. Travel will be very dangerous.', 'Extreme', '2025-03-
04 19:00:00'),
(14, 'Heat Advisory: High temperatures and humidity expected. Stay cool.', 'Severe', '2025-03-05
20:15:00'),
(15, 'Air Quality Alert: Elevated particulate matter levels. Consider wearing masks.', 'Moderate', '2025-
03-06 21:00:00'),
(16, 'Flood Watch: River levels rising. Monitor local forecasts.', 'Severe', '2025-03-07 22:30:00'),
(17, 'Hurricane Watch: Tropical storm strengthening. Prepare for possible hurricane.', 'Extreme', '2025-03-
08 23:45:00'),
(18, 'Excessive Heat Warning: Prolonged period of dangerously hot temperatures.', 'Severe', '2025-03-09
06:00:00'),
(19, 'Winter Weather Advisory: Light snow expected. Plan for slippery roads.', 'Moderate', '2025-03-10
07:15:00'),
(20, 'Tornado Warning: Tornado sighted. Take shelter immediately.', 'Extreme', '2025-03-11 08:00:00'),
(21, 'High Wind Watch: Potential for strong winds. Secure loose objects.', 'Severe', '2025-03-12
09:30:00'),
(22, 'Flash Flood Watch: Heavy rain may lead to flash flooding. Stay alert.', 'Severe', '2025-03-13
10:45:00'),
(23, 'Frost Warning: Early-season frost expected. Protect sensitive plants.', 'Moderate', '2025-03-14
11:00:00'),
(24, 'Dense Fog Warning: Visibility near zero in some areas. Use caution.', 'Severe', '2025-03-15
12:30:00'),
(25, 'Severe Thunderstorm Watch: Conditions are ripe for severe storms.', 'Severe', '2025-03-16 13:45:00'),
(26, 'Blizzard Watch: Heavy snow and strong winds possible. Monitor updates.', 'Severe', '2025-03-17
14:00:00'),
(27, 'Heat Warning: Unusually high temperatures expected. Stay indoors if possible.', 'Severe', '2025-03-18
15:15:00'),
(28, 'Air Quality Watch: Potential for poor air quality due to wildfires.', 'Moderate', '2025-03-19
16:00:00'),
(29, 'Flood Advisory: Minor flooding in low-lying areas. Exercise caution.', 'Moderate', '2025-03-20
17:30:00'),
(30, 'Hurricane Advisory: Tropical storm likely to become a hurricane. Stay prepared.', 'Extreme', '2025-
03-21 18:45:00');
```

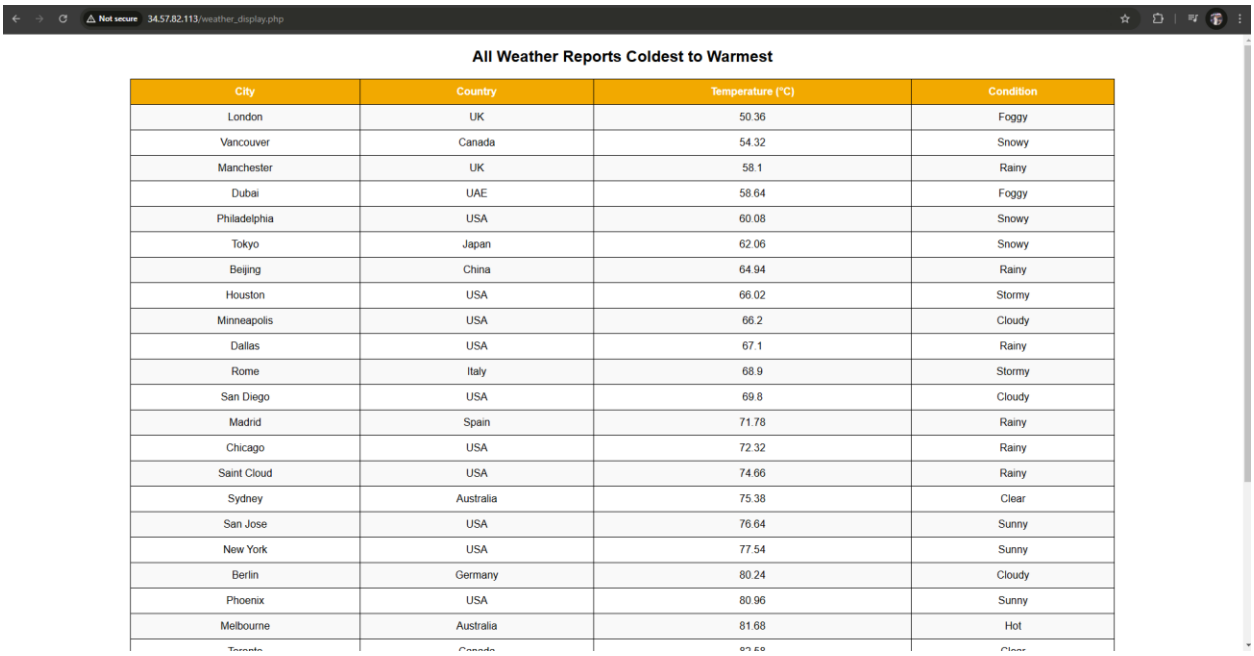
```sql
UPDATE WeatherReports
SET temperature = (temperature * 9/5) + 32;
```

2. Create a connection with your database: have a query displaying the results on the client side e.g. with html, react-native, QML, or xml:
   db_connect.php

```php
<?php
$servername = "localhost";  // Change to VPS IP if accessing remotely
$username = "root";         // Use your MySQL username
$password = "Password"; // Use your MySQL root password
$dbname = "weather_app";    // Your database name

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
?>
```

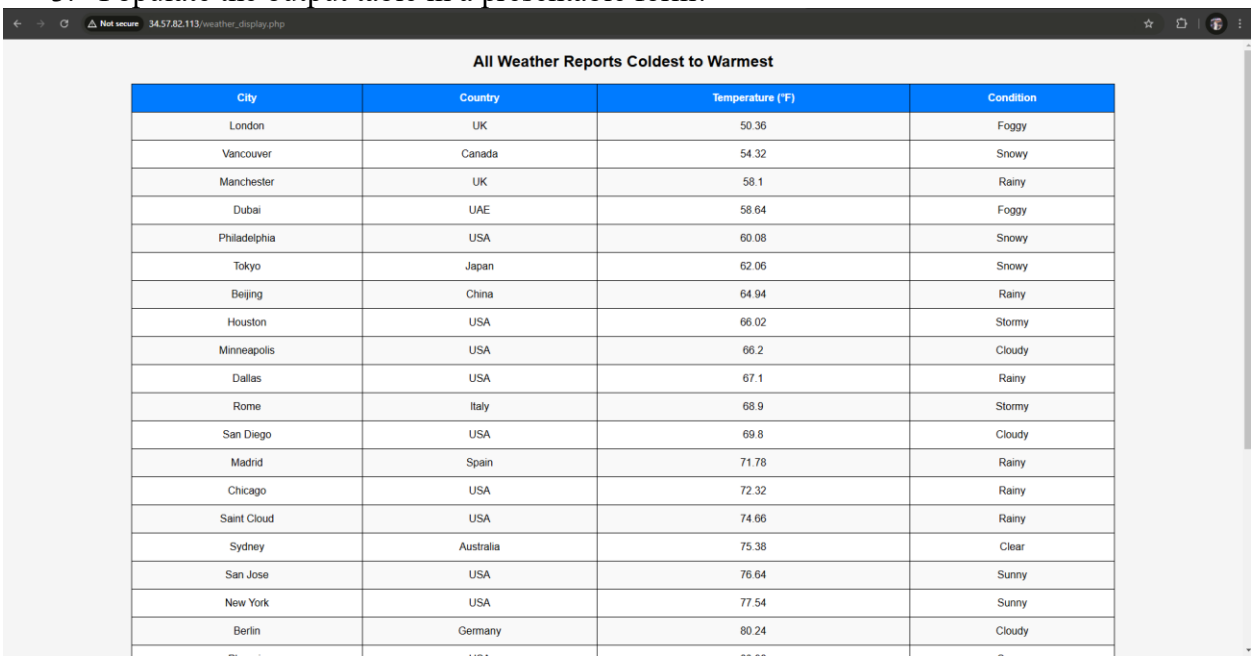
   weather_display.php

```php
<?php
include 'db_connect.php';

// Fetch weather reports with locations
$sql = "SELECT Locations.city, Locations.country, WeatherReports.temperature, WeatherReports.weather_condition
        FROM WeatherReports
        INNER JOIN Locations USING(location_id)
        ORDER BY WeatherReports.temperature ASC";

// Execute query
$result = $conn->query($sql);

// Check for errors
if (!$result) {
    die("Query failed: " . $conn->error);
}
?>

<!DOCTYPE html>
<html lang="en">
<head>
    <title>Weather Reports</title>
    <style>
        body { font-family: Arial, sans-serif; text-align: center; }
        table { width: 80%; margin: auto; border-collapse: collapse; }
        th, td { padding: 10px; border: 1px solid black; }
        th { background-color: #f2a900; color: white; }
        tr:nth-child(even) { background-color: #f9f9f9; }
    </style>
</head>
<body>
    <h2>All Weather Reports Coldest to Warmest</h2>

    <?php if ($result->num_rows > 0): ?>
    <table>
        <tr>
            <th>City</th>
            <th>Country</th>
            <th>Temperature (°C)</th>
            <th>Condition</th>
        </tr>
        <?php while ($row = $result->fetch_assoc()): ?>
        <tr>
            <td><?php echo htmlspecialchars($row['city']); ?></td>
            <td><?php echo htmlspecialchars($row['country']); ?></td>
            <td><?php echo htmlspecialchars($row['temperature']); ?></td>
            <td><?php echo htmlspecialchars($row['weather_condition']); ?></td>
        </tr>
        <?php endwhile; ?>
    </table>
    <?php else: ?>
        <p>No weather reports found.</p>
    <?php endif; ?>

</body>
</html>
```



City	Country	Temperature (°C)	Condition
London	UK	50.36	Foggy
Vancouver	Canada	54.32	Snowy
Manchester	UK	58.1	Rainy
Dubai	UAE	58.64	Foggy
Philadelphia	USA	60.08	Snowy
Tokyo	Japan	62.06	Snowy
Beijing	China	64.94	Rainy
Houston	USA	66.02	Stormy
Minneapolis	USA	66.2	Cloudy
Dallas	USA	67.1	Rainy
Rome	Italy	68.9	Stormy
San Diego	USA	69.8	Cloudy
Madrid	Spain	71.78	Rainy
Chicago	USA	72.32	Rainy
Saint Cloud	USA	74.66	Rainy
Sydney	Australia	75.38	Clear
San Jose	USA	76.64	Sunny
New York	USA	77.54	Sunny
Berlin	Germany	80.24	Cloudy
Phoenix	USA	80.96	Sunny
Melbourne	Australia	81.68	Hot

3. Populate the output table in a presentable form:



City	Country	Temperature (°F)	Condition
London	UK	50.36	Foggy
Vancouver	Canada	54.32	Snowy
Manchester	UK	58.1	Rainy
Dubai	UAE	58.64	Foggy
Philadelphia	USA	60.08	Snowy
Tokyo	Japan	62.06	Snowy
Beijing	China	64.94	Rainy
Houston	USA	66.02	Stormy
Minneapolis	USA	66.2	Cloudy
Dallas	USA	67.1	Rainy
Rome	Italy	68.9	Stormy
San Diego	USA	69.8	Cloudy
Madrid	Spain	71.78	Rainy
Chicago	USA	72.32	Rainy
Saint Cloud	USA	74.66	Rainy
Sydney	Australia	75.38	Clear
San Jose	USA	76.64	Sunny
New York	USA	77.54	Sunny
Berlin	Germany	80.24	Cloudy

New style: (Also changed C to F in the temp collum)

```
<style>
    body { font-family: Arial, sans-serif; text-align: center; background-color: #f5f5f5; }
    h2 { font-weight: bold; color: black; }
    table { width: 80%; margin: auto; border-collapse: collapse; background-color: white; }
    th, td { padding: 12px; border: 1px solid black; text-align: center; }
    th { background-color: #007BFF; color: white; }
    tr:nth-child(even) { background-color: #f9f9f9; }
    tr:hover { background-color: #ddd; }
</style>
```

4. Demonstrate the functionality of your database running at least 3 different queries on it:

Showing rows 0 - 4 (5 total, Query took 0.0011 seconds.)

```
SELECT city, country, temperature FROM Locations INNER JOIN WeatherReports USING(location_id) ORDER BY temperature ASC LIMIT 5
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

+ Options

city	country	temperature ▲ 1
London	UK	50.36
Vancouver	Canada	54.32
Manchester	UK	58.1
Dubai	UAE	58.64
Philadelphia	USA	60.08

This retrieves the 5 coldest locations.

```
SELECT COUNT(*) AS RainyDays FROM WeatherReports WHERE weather_condition = 'Rainy'
```

Profiling [Edit inline]

+ Options

RainyDays
6

This counts how many days were recorded as "Rainy".

```
SELECT Locations.city, Locations.country, WeatherReports.wind_speed FROM WeatherReports INNER JOIN Locations USING(location_id) ORDER BY WeatherReports.wind_speed DESC LIMIT 5
```

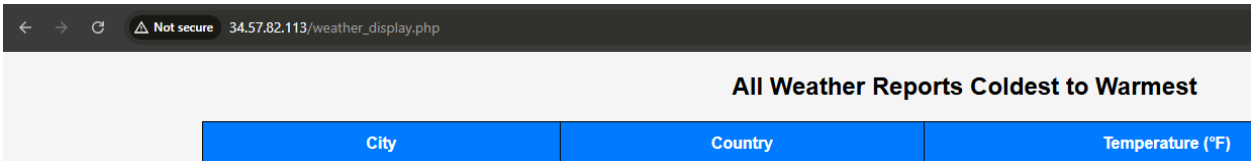
+ Options

city	country	wind_speed ▼ 1
Philadelphia	USA	20
New York	USA	12.5
Tokyo	Japan	12
Melbourne	Australia	11.3
Dallas	USA	11

Retrieves the 5 windiest locations.

5. Show that you are running your database on your VPS in Linux:

```
tehergs@csci-411-linux:~$ sudo systemctl status mysql
● mysql.service - MySQL Community Server
     Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
     Active: active (running) since Mon 2025-02-24 21:12:01 UTC; 40min ago
    Process: 2554 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
   Main PID: 2562 (mysqld)
     Status: "Server is operational"
      Tasks: 39 (limit: 1134)
     Memory: 411.0M
     CGroup: /system.slice/mysql.service
             └─2562 /usr/sbin/mysqld

Feb 24 21:11:59 csci-411-linux systemd[1]: Starting MySQL Community Server...
Feb 24 21:12:01 csci-411-linux systemd[1]: Started MySQL Community Server.
tehergs@csci-411-linux:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Mon 2025-02-24 21:19:27 UTC; 33min ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 2673 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 2677 (apache2)
      Tasks: 11 (limit: 1134)
     Memory: 50.1M
     CGroup: /system.slice/apache2.service
             ├─2677 /usr/sbin/apache2 -k start
             ├─2678 /usr/sbin/apache2 -k start
             ├─2679 /usr/sbin/apache2 -k start
             ├─2680 /usr/sbin/apache2 -k start
             ├─2681 /usr/sbin/apache2 -k start
             ├─2682 /usr/sbin/apache2 -k start
             ├─2690 /usr/sbin/apache2 -k start
             ├─2691 /usr/sbin/apache2 -k start
             ├─2692 /usr/sbin/apache2 -k start
             ├─2693 /usr/sbin/apache2 -k start
             └─2803 /usr/sbin/apache2 -k start

Feb 24 21:19:27 csci-411-linux systemd[1]: Starting The Apache HTTP Server...
Feb 24 21:19:27 csci-411-linux systemd[1]: Started The Apache HTTP Server.
tehergs@csci-411-linux:~$
```


Not secure
34.57.82.113/weather_display.php
All Weather Reports Coldest to Warmest
City
Country
Temperature (°F)