--Retrieve all energy consumption data

SELECT * FROM energy_consumption;

	consumption_id [PK] integer	region_id integer	date date	hour_of_day integer	energy_consumed_mwh numeric (10,2)
1	4	2	2024-03-01	0	175.50
2	5	2	2024-03-01	1	160.20
3	6	2	2024-03-01	2	158.75
4	7	3	2024-03-01	0	130.60
5	8	3	2024-03-01	1	145.90
6	9	3	2024-03-01	2	140.10
7	12	2	2024-03-02	0	178.40
8	13	2	2024-03-02	1	162.50
9	14	3	2024-03-02	0	135.75
10	15	3	2024-03-02	1	147.20
11	1	1	2024-03-01	0	800.00
12	2	1	2024-03-01	1	800.00
13	3	1	2024-03-01	2	800.00
14	10	1	2024-03-02	0	800.00
15	11	1	2024-03-02	1	800.00
16	16	1	2024-03-02	14	800.00

--Find all records for a specific date (e.g., March 1, 2024)

SELECT * FROM energy_consumption WHERE date = '2024-03-01';

	consumption_id [PK] integer	region_id integer	date date	hour_of_day integer	energy_consumed_mwh numeric (10,2)
1	4	2	2024-03-01	0	175.50
2	5	2	2024-03-01	1	160.20
3	6	2	2024-03-01	2	158.75
4	7	3	2024-03-01	0	130.60
5	8	3	2024-03-01	1	145.90
6	9	3	2024-03-01	2	140.10
7	1	1	2024-03-01	0	800.00
8	2	1	2024-03-01	1	800.00
9	3	1	2024-03-01	2	800.00

--Retrieve energy consumption for a specific region (e.g., "North")

```
SELECT *
FROM energy_consumption ec
JOIN regions r ON ec.region_id = r.region_id
WHERE r.region_name = 'North';
```

	consumption_id integer	region_id integer	date date	hour_of_day integer	energy_consumed_mwh numeric (10,2)	region_id integer	region_name character varying (50)	population integer
1	1	1	2024-03-01	0	800.00	1	North	500000
2	2	1	2024-03-01	1	800.00	1	North	500000
3	3	1	2024-03-01	2	800.00	1	North	500000
4	10	1	2024-03-02	0	800.00	1	North	500000
5	11	1	2024-03-02	1	800.00	1	North	500000
6	16	1	2024-03-02	14	800.00	1	North	500000

--Find total energy consumed per region

```
SELECT r.region_name, SUM(ec.energy_consumed_mwh) AS total_energy
FROM energy_consumption ec
JOIN regions r ON ec.region_id = r.region_id
GROUP BY r.region_name;
```

	region_name character varying (50)	total_energy numeric
1	East	699.55
2	South	835.35
3	North	4800.00

--Find average energy consumption per hour for each region

```
SELECT r.region_name, AVG(ec.energy_consumed_mwh) AS Avg_energy
FROM energy_consumption ec
JOIN regions r ON ec.region_id = r.region_id
GROUP BY r.region_name;
```

	region_name character varying (50)	avg_energy numeric
1	East	139.9100000000000000
2	South	167.0700000000000000
3	North	800.0000000000000000

--List energy records ordered by consumption in descending order.

SELECT * FROM energy_consumption ORDER BY energy_consumed_mwh DESC;

	consumption_id [PK] integer	region_id integer	date date	hour_of_day integer	energy_consumed_mwh numeric (10,2)
1	1	1	2024-03-01	0	800.00
2	16	1	2024-03-02	14	800.00
3	11	1	2024-03-02	1	800.00
4	10	1	2024-03-02	0	800.00
5	3	1	2024-03-01	2	800.00
6	2	1	2024-03-01	1	800.00
7	12	2	2024-03-02	0	178.40
8	4	2	2024-03-01	0	175.50
9	13	2	2024-03-02	1	162.50
10	5	2	2024-03-01	1	160.20
11	6	2	2024-03-01	2	158.75
12	15	3	2024-03-02	1	147.20
13	8	3	2024-03-01	1	145.90
14	9	3	2024-03-01	2	140.10
15	14	3	2024-03-02	0	135.75
16	7	3	2024-03-01	0	130.60

-- Find energy consumption between 500 and 1000 MWh.

SELECT * FROM energy_consumption WHERE energy_consumed_mwh BETWEEN 500 AND 1000;

	consumption_id [PK] integer	region_id integer	date date	hour_of_day integer	energy_consumed_mwh numeric (10,2)
1	1	1	2024-03-01	0	800.00
2	2	1	2024-03-01	1	800.00
3	3	1	2024-03-01	2	800.00
4	10	1	2024-03-02	0	800.00
5	11	1	2024-03-02	1	800.00
6	16	1	2024-03-02	14	800.00

-- Find regions containing "South" in the name.

SELECT * FROM regions WHERE region_name LIKE '%South%';

	region_id [PK] integer	region_name character varying (50)	population integer
1	2	South	700000

-- Retrieve the top 5 highest energy consumption records.

SELECT * FROM energy_consumption

ORDER BY(energy_consumed_mwh) DESC LIMIT 5;

	consumption_id [PK] integer	region_id integer	date date	hour_of_day integer	energy_consumed_mwh numeric (10,2)
1	10	1	2024-03-02	0	800.00
2	1	1	2024-03-01	0	800.00
3	2	1	2024-03-01	1	800.00
4	3	1	2024-03-01	2	800.00
5	11	1	2024-03-02	1	800.00

-- Count the total number of energy consumption records.

SELECT COUNT(*) FROM energy_consumption;

	count bigint
1	16

-- Find regions where total energy consumption is above 500 MWh.

SELECT r.region_name, SUM(ec.energy_consumed_mwh) AS total_energy

FROM energy_consumption ec

JOIN regions r ON ec.region_id = r.region_id

GROUP BY r.region_name

HAVING SUM(ec.energy_consumed_mwh) > 500;

	region_name character varying (50)	total_energy numeric
1	East	699.55
2	South	835.35
3	North	4800.00

-- Find energy consumption per region.

SELECT ec.date, r.region_name, ec.energy_consumed_mwh

FROM energy_consumption ec

INNER JOIN regions r ON ec.region_id = r.region_id;

	date date	region_name character varying (50)	energy_consumed_mwh numeric (10,2)
1	2024-03-01	South	175.50
2	2024-03-01	South	160.20
3	2024-03-01	South	158.75
4	2024-03-01	East	130.60
5	2024-03-01	East	145.90
6	2024-03-01	East	140.10
7	2024-03-02	South	178.40
8	2024-03-02	South	162.50
9	2024-03-02	East	135.75
10	2024-03-02	East	147.20
11	2024-03-01	North	800.00
12	2024-03-01	North	800.00
13	2024-03-01	North	800.00
14	2024-03-02	North	800.00
15	2024-03-02	North	800.00
16	2024-03-02	North	800.00

-- Show all regions even if they have no energy data (LEFT JOIN).

SELECT r.region_name, ec.energy_consumed_mwh

FROM regions r

LEFT JOIN energy_consumption ec ON r.region_id = ec.region_id;

	region_name character varying (50)	energy_consumed_mwh numeric (10,2)
2	South	160.20
3	South	158.75
4	East	130.60
5	East	145.90
6	East	140.10
7	South	178.40
8	South	162.50
9	East	135.75
10	East	147.20
11	North	800.00
12	North	800.00
13	North	800.00
14	North	800.00
15	North	800.00
16	North	800.00

-- Find the region with the highest energy consumption.

```
SELECT region_name FROM regions WHERE region_id = (
   SELECT region_id FROM energy_consumption
   GROUP BY region_id
   ORDER BY SUM(energy_consumed_mwh) DESC
   LIMIT 1
);
```

	region_name character varying (50)
1	North

-- Find energy records above the daily average.

```
SELECT * FROM energy_consumption ec
```

```
WHERE ec.energy_consumed_mwh > (
    SELECT AVG(energy_consumed_mwh) FROM energy_consumption WHERE ec.date = date
);
```

	consumption_id [PK] integer	region_id integer	date date	hour_of_day integer	energy_consumed_mwh numeric (10,2)
1	1	1	2024-03-01	0	800.00
2	2	1	2024-03-01	1	800.00
3	3	1	2024-03-01	2	800.00
4	10	1	2024-03-02	0	800.00
5	11	1	2024-03-02	1	800.00
6	16	1	2024-03-02	14	800.00

```
-- Find the top 3 energy-consuming regions.
WITH region_totals AS (
    SELECT r.region_name, SUM(ec.energy_consumed_mwh) AS total_energy
    FROM energy_consumption ec
    JOIN regions r ON ec.region_id = r.region_id
    GROUP BY r.region_name
)
SELECT * FROM region_totals ORDER BY total_energy DESC LIMIT 3;
```

	region_name character varying (50)	total_energy numeric
1	North	4800.00
2	South	835.35
3	East	699.55

```
-- Rank regions based on total energy consumption.
SELECT r.region_name, SUM(ec.energy_consumed_mwh) AS total_energy,
RANK() OVER (ORDER BY SUM(ec.energy_consumed_mwh) DESC) AS rank
FROM energy_consumption ec
JOIN regions r ON ec.region_id = r.region_id
```

GROUP BY r.region_name;

	region_name character varying (50)	total_energy numeric	rank bigint
1	North	4800.00	1
2	South	835.35	2
3	East	699.55	3

-- Update energy consumption value.

UPDATE energy_consumption

SET energy_consumed_mwh = 800

WHERE region_id = 1;

Data Output Messages Notifications

```
UPDATE 6

Query returned successfully in 394 msec.
```

-- Insert new energy consumption data.

INSERT INTO energy_consumption (region_id, date, hour_of_day, energy_consumed_mwh)

VALUES (1, '2024-03-02', 14, 750.5);

Data Output Messages Notifications

```
INSERT 0 1

Query returned successfully in 213 msec.
```

-- Delete all energy data before 2020.

DELETE FROM energy_consumption WHERE date < '2020-01-01';

Data Output Messages Notifications

```
DELETE 0

Query returned successfully in 501 msec.
```

```
-- Add a new column to store population.
ALTER TABLE regions ADD COLUMN population INT;


-- Drop the regions table.
DROP TABLE regions;
```