Class Assignment 1

1. Find all employees whose first names start with a vowel and whose last names end with a consonant

```
SELECT *
FROM employees
WHERE first_name REGEXP '^[aeiouAEIOU]'
AND last_name REGEXP '[^aeiouAEIOU]$';
```

2. For each department, display the total salary expenditure, the average salary, and the highest salary. Use window functions to calculate the total, average, and max salary, but show each result for all employees in that department.

```
SELECT
  department_id,
  employee_id,
  salary,
  SUM(salary) OVER (PARTITION BY department_id) AS total_salary_expenditure,
  AVG(salary) OVER (PARTITION BY department_id) AS avg_salary,
  MAX(salary) OVER (PARTITION BY department_id) AS max_salary
FROM employees;
```

3. Write a query that fetches the following:

All employees, their department name, their manager's name (if they have one), and their salary.

You will need to:

Join employees with their department.

Perform a self-join to fetch the manager's name.

```
SELECT
```

```
  e.employee_id,
  e.first_name || ' ' || e.last_name AS employee_name,
  d.department_name,
  e.salary,
  m.first_name || ' ' || m.last_name AS manager_name
FROM employees e
JOIN departments d ON e.department_id = d.department_id
LEFT JOIN employees m ON e.manager_id = m.employee_id;
```

4. Create a query using a recursive CTE to list all employees and their respective reporting chains (i.e., list the manager's manager and so on).

```
WITH RECURSIVE ReportingChain AS (
  SELECT
    employee_id,
    first_name || ' ' || last_name AS employee_name,
    manager_id,
    CAST(first_name || ' ' || last_name AS VARCHAR(255)) AS reporting_chain
  FROM employees
  WHERE manager_id IS NULL

  UNION ALL

  SELECT
    e.employee_id,
    e.first_name || ' ' || e.last_name AS employee_name,
    e.manager_id,
    rc.reporting_chain || ' -> ' || e.first_name || ' ' || e.last_name AS reporting_chain
  FROM employees e
  JOIN ReportingChain rc ON e.manager_id = rc.employee_id
```

```
)

SELECT
  employee_id,
  employee_name,
  reporting_chain
FROM ReportingChain;
```

5. Write a query to fetch the details of employees earning above a certain salary threshold. Investigate the performance of this query and suggest improvements, including the use of indexes

```
SELECT employee_id, first_name, last_name, department_id, salary
FROM employees
WHERE salary > 50000;
```

6. You need to create a detailed sales report. First, create a temporary table to store interim sales data for each product, including total sales, average sales per customer, and the top salesperson for each product.

Hint:

Use temporary tables and insert data from subqueries.

```
CREATE TEMPORARY TABLE temp_sales_report (
  product_id INT,
  product_name VARCHAR(255),
  total_sales DECIMAL(10, 2),
  average_sales_per_customer DECIMAL(10, 2),
  top_salesperson_id INT,
  top_salesperson_name VARCHAR(255)
);

INSERT INTO temp_sales_report (product_id, product_name, total_sales, average_sales_per_customer,
top_salesperson_id, top_salesperson_name)
```

```
SELECT
  p.product_id,
  p.product_name,
  SUM(s.amount) AS total_sales,
  AVG(s.amount) AS average_sales_per_customer,
  sp.salesperson_id AS top_salesperson_id,
  sp.first_name || ' ' || sp.last_name AS top_salesperson_name
FROM products p
JOIN sales s ON p.product_id = s.product_id
JOIN (
  SELECT
    s1.product_id,
    s1.salesperson_id,
    SUM(s1.amount) AS total_sales_by_salesperson
  FROM sales s1
  GROUP BY s1.product_id, s1.salesperson_id
  HAVING SUM(s1.amount) = (
    SELECT MAX(SUM(s2.amount))
    FROM sales s2
    WHERE s2.product_id = s1.product_id
    GROUP BY s2.salesperson_id
  )
) top_sp ON p.product_id = top_sp.product_id AND s.salesperson_id = top_sp.salesperson_id
JOIN salespeople sp ON top_sp.salesperson_id = sp.salesperson_id
GROUP BY p.product_id, p.product_name, sp.salesperson_id, sp.first_name, sp.last_name;

SELECT * FROM temp_sales_report;
```

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