

10 advanced
SQL interview
practical
query
questions
along with
their solutions

1. Question: Retrieve the top 5 highest-paid employees for each department, sorted by salary in descending order.

Solution

```
1  SELECT
2      department,
3      employee_name,
4      salary
5  FROM
6  (
7      SELECT
8          department,
9          employee_name,
10         salary,
11     ROW_NUMBER() OVER (
12         PARTITION BY department
13         ORDER BY
14             salary DESC
15     ) AS rank
16  FROM
17      employees
18  ) ranked
19 WHERE
20     rank <= 5;
```

2. Question: Calculate the total sales for each month of the current year, including months with zero sales.

```
1  SELECT
2      to_char(sale_date, 'YYYY-MM') AS month,
3  COALESCE(
4      SUM(sales_amount),
5      0
6  ) AS total_sales
7  FROM
8  generate_series(
9      DATE_TRUNC('YEAR', CURRENT_DATE),
10     DATE_TRUNC('YEAR', CURRENT_DATE) + INTERVAL '1 year' - INTERVAL '1 day',
11     INTERVAL '1 month'
12 ) AS months(sale_date)
13 LEFT JOIN sales ON to_char(sale_date, 'YYYY-MM') = to_char(sales_date, 'YYYY-MM')
14 GROUP BY
15     month;
```

3. Question: Find customers who have made a purchase every month for the last six months.

```
1  SELECT
2    customer_id
3  FROM
4    customers
5 WHERE
6+   date_trunc('month', CURRENT_DATE) - INTERVAL '6 months' <= ALL (
7    SELECT
8      date_trunc('month', purchase_date)
9    FROM
10   purchases
11 WHERE
12   customer_id = customers.customer_id
13 );
```

4. Question: Calculate the running total of sales for each day within the past month.

```
SELECT
  date,
  SUM(sales_amount) OVER (
    ORDER BY
      date
  ) AS running_total
FROM
  generate_series(
    DATE_TRUNC('MONTH', CURRENT_DATE) - INTERVAL '1 month',
    DATE_TRUNC('MONTH', CURRENT_DATE) - INTERVAL '1 day',
    INTERVAL '1 day'
  ) AS dates(date)
  LEFT JOIN sales ON dates.date = sales.sales_date;
```

5. Question: List the products that have been sold in all cities where the company operates.

```
1 SELECT
2   product_id,
3   product_name
4 FROM
5   products
6 WHERE
7   product_id NOT IN (
8     SELECT
9       DISTINCT product_id
10    FROM
11      sales
12    WHERE
13      city NOT IN (
14        SELECT
15          DISTINCT city
16        FROM
17          locations
18      )
19 );
```

6. Question: Retrieve the top 10 customers who have spent the most on their single purchase.

```
1 SELECT
2   customer_id,
3   MAX(purchase_amount) AS max_purchase_amount
4 FROM
5   purchases
6 GROUP BY
7   customer_id
8 ORDER BY
9   max_purchase_amount DESC
10 LIMIT
11  10;
```

7. Question: Find the employees who manage the same number of employees as their manager.

```
1 SELECT
2   e1.employee_name AS employee,
3   e1.managed_count AS direct_reports
4 FROM
5   employees e1
6   JOIN employees e2 ON e1.manager_id = e2.employee_id
7 WHERE
8   e1.managed_count = e2.managed_count;
```

8. Question: Calculate the 30-day moving average of sales for each product.

```
1 SELECT
2   product_id,
3   sales_date,
4   sales_amount,
5   AVG(sales_amount) OVER (
6     PARTITION BY product_id
7     ORDER BY
8       sales_date RANGE BETWEEN INTERVAL '30 days' PRECEDING
9       AND CURRENT ROW
10    ) AS moving_avg
11 FROM
12   sales;
```

9. Question: List the departments where the average salary is higher than the company's overall average salary.

```
1  SELECT
2      department
3  FROM
4      employees
5  GROUP BY
6      department
7  HAVING
8  AVG(salary) > (
9      SELECT
10         AVG(salary)
11     FROM
12         employees
13 );
```

10. Question: Retrieve the top 3 most recent orders for each customer.

```
1  SELECT
2      customer_id,
3      order_id,
4      order_date
5  FROM
6  (
7      SELECT
8          customer_id,
9          order_id,
10         order_date,
11     ROW_NUMBER() OVER (
12         PARTITION BY customer_id
13         ORDER BY
14             order_date DESC
15     ) AS rank
16     FROM
17         orders
18 ) ranked
19 WHERE
20     rank <= 3;
```