

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;
```