Retail Sales Case Study SQL Queries

1. Query aggregate daily sales into monthly total,using Common Table Expressions (CTE).

```sql
--query to aggregate daily sales into monthly totals
WITH MonthlyData AS (
    SELECT DATE_TRUNC('month', sale_date) AS month_start,
        SUM(sales) AS monthly_sales,
        SUM(cost_of_sales) AS monthly_cos
    FROM salesdata
    GROUP BY month_start)
    SELECT *
    FROM monthlydata;
```

```
2    --query to aggregate daily sales into monthly totals
3    WITH MonthlyData AS (
4        SELECT DATE_TRUNC('month', sale_date) AS month_start,
5            SUM(sales) AS monthly_sales,
6            SUM(cost_of_sales) AS monthly_cos
7        FROM salesdata
8        GROUP BY month_start)
9        SELECT *
10       FROM monthlydata;
```

Add parameter

Table +

month_start	monthly_sales	monthly_cos
1	2013-12-01T00:00:00.000+00:...	524283.4525	537065.7415
2	2014-01-01T00:00:00.000+00:...	4008180.4888699995	3995719.8435100005
3	2014-02-01T00:00:00.000+00:...	5780487.17536	5913478.56083
4	2014-03-01T00:00:00.000+00:...	8279517.1759399995	8415654.01925
5	2014-04-01T00:00:00.000+00:...	6435743.274010001	6479643.625130001
6	2014-05-01T00:00:00.000+00:...	7694906.153390001	8017240.417160001
7	2014-06-01T00:00:00.000+00:...	6456943.6466999985	6645843.656900001

2. Query to calculate MoM % Sales Growth

```sql
-- query to calculate growth rates using LAG() MoM % Sales Growth
SELECT
    month_start,
    monthly_sales,
    monthly_cos,
    ROUND( (monthly_sales - LAG(monthly_sales, 1) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_sales, 1) OVER (ORDER BY month_start), 0)
    , 2) AS MoM_Sales_Growth_Pct
    FROM
    MonthlyData
ORDER BY
    month_start;
```

	month_start	monthly_sales	monthly_cos	MoM_Sales_Growth_Pct
1	2013-12-01T00:00:00.000+00:...	524283.4525	537065.7415	null
2	2014-01-01T00:00:00.000+00:...	4008180.4888699995	3995719.8435100005	664.51
3	2014-02-01T00:00:00.000+00:...	5780487.17536	5913478.56083	44.22
4	2014-03-01T00:00:00.000+00:...	8279517.1759399995	8415654.01925	43.23
5	2014-04-01T00:00:00.000+00:...	6435743.274010001	6479643.625130001	-22.27
6	2014-05-01T00:00:00.000+00:...	7694906.153390001	8017240.417160001	19.57
7	2014-06-01T00:00:00.000+00:...	6456943.6466999985	6645843.656900001	-16.09
8	2014-07-01T00:00:00.000+00:...	4933710.80073	5004894.90187	-23.59
9	2014-08-01T00:00:00.000+00:...	10010378.287800001	10524432.424649999	102.9
10	2014-09-01T00:00:00.000+00:...	7643452.68558	8193560.03927	-23.64
11	2014-10-01T00:00:00.000+00:...	5924683.381159999	6038461.31732	-22.49

3. Query to calculate YoY% Sales Growth

```sql
--query to determine YoY % Sales Growth

SELECT
    month_start,
    monthly_sales,
    monthly_cos,
    ROUND((monthly_sales - LAG(monthly_sales, 12) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_sales, 12) OVER (ORDER BY month_start), 0)
    , 2) AS YoY_Sales_Growth_Pct
 FROM
    MonthlyData
ORDER BY
    month_start;
```

	month_start	monthly_sales	monthly_cos	YoY_Sales_Growth_Pct
17	2015-04-01T00:00:00.000+00:...	5963993.967710001	6286673.6644399995	-7.33
18	2015-05-01T00:00:00.000+00:...	8384367.24117	8973701.89859	8.96
19	2015-06-01T00:00:00.000+00:...	5332108.3231999995	5520925.368850001	-17.42
20	2015-07-01T00:00:00.000+00:...	3677692.39401	3829188.5650899997	-25.46
21	2015-08-01T00:00:00.000+00:...	3934668.40828	4210927.33506	-60.69
22	2015-09-01T00:00:00.000+00:...	4669899.858689999	5024494.695	-38.9
23	2015-10-01T00:00:00.000+00:...	4828975.079689999	5175494.07743	-18.49
24	2015-11-01T00:00:00.000+00:...	6538148.883440001	7138833.454579999	148.47
25	2015-12-01T00:00:00.000+00:...	6820689.677790002	7154317.320400001	21.46
26	2016-01-01T00:00:00.000+00:...	5403090.50947	5657342.715229999	46.18
27	2016-02-01T00:00:00.000+00:...	4891882.30803	4889303.643619999	-0.2

4. Query to calculate MoM % Cost of Sales Growth

```sql
--query to calculate MoM Growth CoS
SELECT
    month_start,
    monthly_sales,
    monthly_cos,
ROUND((monthly_cos - LAG(monthly_cos, 1) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_cos, 1) OVER (ORDER BY month_start), 0)
    , 2) AS MoM_COS_Growth_Pct
    FROM
    MonthlyData
ORDER BY
    month_start;
```

	month_start		monthly_sales	monthly_cos	MoM_COS_Growth_Pct
17	2015-04-01T00:00:00.000+00:...		5963993.967710001	6286673.6644399995	12.27
18	2015-05-01T00:00:00.000+00:...		8384367.24117	8973701.89859	42.74
19	2015-06-01T00:00:00.000+00:...		5332108.3231999995	5520925.368850001	-38.48
20	2015-07-01T00:00:00.000+00:...		3677692.39401	3829188.5650899997	-30.64
21	2015-08-01T00:00:00.000+00:...		3934668.40828	4210927.33506	9.97
22	2015-09-01T00:00:00.000+00:...		4669899.858689999	5024494.695	19.32
23	2015-10-01T00:00:00.000+00:...		4828975.079689999	5175494.07743	3.01
24	2015-11-01T00:00:00.000+00:...		6538148.883440001	7138833.454579999	37.94
25	2015-12-01T00:00:00.000+00:...		6820689.677790002	7154317.320400001	0.22
26	2016-01-01T00:00:00.000+00:...		5403090.50947	5657342.715229999	-20.92
27	2016-02-01T00:00:00.000+00:...		4891882.30803	4889303.643619999	-13.58
28	2016-03-01T00:00:00.000+00:...		2951856.00567	2917801.49129	-40.32

5. Query to calculate YoY % Cost of Sales Growth

```sql
--query to calculate YoY Growth CoS

SELECT
    month_start,
    monthly_sales,
    monthly_cos,
    ROUND(
        (monthly_cos - LAG(monthly_cos, 12) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_cos, 12) OVER (ORDER BY month_start), 0)
    , 2) AS YoY_COS_Growth_Pct
    FROM
    MonthlyData
ORDER BY
    month_start;
```

	month_start	monthly_sales	monthly_cos	YoY_COS_Growth_Pct
17	2015-04-01T00:00:00.000+00:...	5963993.967710001	6286673.6644399995	-2.98
18	2015-05-01T00:00:00.000+00:...	8384367.24117	8973701.89859	11.93
19	2015-06-01T00:00:00.000+00:...	5332108.3231999995	5520925.368850001	-16.93
20	2015-07-01T00:00:00.000+00:...	3677692.39401	3829188.5650899997	-23.49
21	2015-08-01T00:00:00.000+00:...	3934668.40828	4210927.33506	-59.99
22	2015-09-01T00:00:00.000+00:...	4669899.858689999	5024494.695	-38.68
23	2015-10-01T00:00:00.000+00:...	4828975.079689999	5175494.07743	-14.29
24	2015-11-01T00:00:00.000+00:...	6538148.883440001	7138833.454579999	183.61
25	2015-12-01T00:00:00.000+00:...	6820689.677790002	7154317.320400001	20.55
26	2016-01-01T00:00:00.000+00:...	5403090.50947	5657342.715229999	46.9
27	2016-02-01T00:00:00.000+00:...	4891882.30803	4889303.643619999	-5.09
28	2016-03-01T00:00:00.000+00:...	2951856.00567	2917801.49129	-47.89

6. Query to create a new transformed, inclusive table of MoM % and YoY% for both Sales and Cost of Sales respectively.

```
SELECT
    month_start,
    monthly_sales,
    monthly_cos,
    ROUND((monthly_sales - LAG(monthly_sales, 1) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_sales, 1) OVER (ORDER BY month_start), 0)
    , 2) AS MoM_Sales_Growth_Pct,
    ROUND((monthly_sales - LAG(monthly_sales, 12) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_sales, 12) OVER (ORDER BY month_start), 0)
    , 2) AS YoY_Sales_Growth_Pct,
    ROUND((monthly_cos - LAG(monthly_cos, 1) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_cos, 1) OVER (ORDER BY month_start), 0)
    , 2) AS MoM_COS_Growth_Pct,
    ROUND((monthly_cos - LAG(monthly_cos, 12) OVER (ORDER BY month_start)) * 100.0 /
        NULLIF(LAG(monthly_cos, 12) OVER (ORDER BY month_start), 0)
    , 2) AS YoY_COS_Growth_Pct
FROM
    MonthlyData
ORDER BY
    month_start;
```

Table ∨ +

	monthly_cos	MoM_Sales_Growth_Pct	YoY_Sales_Growth_Pct	MoM_COS_Growth_Pct	YoY_COS_Growth_Pct
13	5934796.059359998	113.41	971.1	135.78	1005.04
14	3851260.466549999	-34.18	-7.78	-35.11	-3.62
15	5151756.26786	32.61	-15.21	33.77	-12.88
16	5599630.720349998	7.5	-36.36	8.69	-33.46
17	6286673.6644399995	13.18	-7.33	12.27	-2.98
18	8973701.89859	40.58	8.96	42.74	11.93
19	5520925.368850001	-36.4	-17.42	-38.48	-16.93
20	3829188.5650899997	-31.03	-25.46	-30.64	-23.49
21	4210927.33506	6.99	-60.69	9.97	-59.99
22	5024494.695	18.69	-38.9	19.32	-38.68