

# **Basis Data Lanjut**

## **Window Ranking, Offset, dan Fungsi Agregat**

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**2021**

## Praktikum 1: Menulis Query Menggunakan Fungsi RANKING

1. Tulislah pernyataan SELECT untuk mengambil kolom orderid, orderdate, dan val serta kolom hasil perhitungan bernama rowno dari view Sales.OrderValues! Gunakan fungsi ROW\_NUMBER untuk mengembalikan rowno, urutkan nomor baris berdasarkan kolom orderdate!

**Jawaban:**

```
51 - Lab Exercise 1...aulana Bintang (51))  ➦ ✕  
-- Maulana Bintang Irfansyah - 15 - TI 2H  
SELECT  
    orderid, orderdate, val,  
    ROW_NUMBER() OVER (ORDER BY orderdate) AS rowno  
FROM Sales.OrderValues;
```

|    | orderid | orderdate               | val     | rowno |
|----|---------|-------------------------|---------|-------|
| 1  | 10248   | 2006-07-04 00:00:00.000 | 440.00  | 1     |
| 2  | 10249   | 2006-07-05 00:00:00.000 | 1863.40 | 2     |
| 3  | 10250   | 2006-07-08 00:00:00.000 | 1552.60 | 3     |
| 4  | 10251   | 2006-07-08 00:00:00.000 | 654.06  | 4     |
| 5  | 10252   | 2006-07-09 00:00:00.000 | 3597.90 | 5     |
| 6  | 10253   | 2006-07-10 00:00:00.000 | 1444.80 | 6     |
| 7  | 10254   | 2006-07-11 00:00:00.000 | 556.62  | 7     |
| 8  | 10255   | 2006-07-12 00:00:00.000 | 2490.50 | 8     |
| 9  | 10256   | 2006-07-15 00:00:00.000 | 517.80  | 9     |
| 10 | 10257   | 2006-07-16 00:00:00.000 | 1119.90 | 10    |
| 11 | 10258   | 2006-07-17 00:00:00.000 | 1614.88 | 11    |
| 12 | 10259   | 2006-07-18 00:00:00.000 | 100.80  | 12    |
| 13 | 10260   | 2006-07-19 00:00:00.000 | 1504.65 | 13    |
| 14 | 10261   | 2006-07-19 00:00:00.000 | 448.00  | 14    |
| 15 | 10262   | 2006-07-22 00:00:00.000 | 584.00  | 15    |
| 16 | 10263   | 2006-07-23 00:00:00.000 | 1873.80 | 16    |
| 17 | 10264   | 2006-07-24 00:00:00.000 | 695.63  | 17    |
| 18 | 10265   | 2006-07-25 00:00:00.000 | 1176.00 | 18    |
| 19 | 10266   | 2006-07-26 00:00:00.000 | 346.56  | 19    |
| 20 | 10267   | 2006-07-29 00:00:00.000 | 3536.60 | 20    |

Query executed successfully. LAPTOP-39OHL046,DBMS2021 (1... LAPTOP-39OHL046,Maulan... TSQL 00:00:00 830 rows

2. Salin T-SQL pada soal no 1. Kemudian modifikasi dengan memasukkan kolom tambahan bernama rankno. Untuk membuat rankno gunakan fungsi RANK dengan urutan peringkat berdasarkan kolom orderdate!

**Jawaban:**

```
51 - Lab Exercise 1...aulana Bintang (51))  ➦ ✕  
-- Maulana Bintang Irfansyah - 15 - TI 2H  
SELECT  
    orderid, orderdate, val,  
    ROW_NUMBER() OVER (ORDER BY orderdate) AS rowno,  
    RANK() OVER (ORDER BY orderdate) AS rankno  
FROM Sales.OrderValues;
```

Results Messages

|    | orderid | orderdate               | val     | rowno | rankno |
|----|---------|-------------------------|---------|-------|--------|
| 1  | 10248   | 2006-07-04 00:00:00.000 | 440.00  | 1     | 1      |
| 2  | 10249   | 2006-07-05 00:00:00.000 | 1863.40 | 2     | 2      |
| 3  | 10250   | 2006-07-08 00:00:00.000 | 1552.60 | 3     | 3      |
| 4  | 10251   | 2006-07-08 00:00:00.000 | 654.06  | 4     | 3      |
| 5  | 10252   | 2006-07-09 00:00:00.000 | 3597.90 | 5     | 5      |
| 6  | 10253   | 2006-07-10 00:00:00.000 | 1444.80 | 6     | 6      |
| 7  | 10254   | 2006-07-11 00:00:00.000 | 556.62  | 7     | 7      |
| 8  | 10255   | 2006-07-12 00:00:00.000 | 2490.50 | 8     | 8      |
| 9  | 10256   | 2006-07-15 00:00:00.000 | 517.80  | 9     | 9      |
| 10 | 10257   | 2006-07-16 00:00:00.000 | 1119.90 | 10    | 10     |
| 11 | 10258   | 2006-07-17 00:00:00.000 | 1614.88 | 11    | 11     |
| 12 | 10259   | 2006-07-18 00:00:00.000 | 100.80  | 12    | 12     |
| 13 | 10260   | 2006-07-19 00:00:00.000 | 1504.65 | 13    | 13     |
| 14 | 10261   | 2006-07-19 00:00:00.000 | 448.00  | 14    | 13     |
| 15 | 10262   | 2006-07-22 00:00:00.000 | 584.00  | 15    | 15     |
| 16 | 10263   | 2006-07-23 00:00:00.000 | 1873.80 | 16    | 16     |
| 17 | 10264   | 2006-07-24 00:00:00.000 | 695.63  | 17    | 17     |
| 18 | 10265   | 2006-07-25 00:00:00.000 | 1176.00 | 18    | 18     |
| 19 | 10266   | 2006-07-26 00:00:00.000 | 346.56  | 19    | 19     |
| 20 | 10267   | 2006-07-29 00:00:00.000 | 3536.60 | 20    | 20     |

Query executed successfully.

LAPTOP-39OHL046\DBMS2021 (1...LAPTOP-39OHL046\Maulan...TSQL00:00:00830 rows

3. Apakah perbedaan antara fungsi RANK dan fungsi ROW\_NUMBER?

### Jawaban:

Fungsi RANK digunakan untuk menetapkan nomor unik ke setiap baris yang berbeda, tetapi meninggalkan pelompatan nomor atau gap di antara kedua kelompok, yaitu nilai akan berubah berdasarkan nilai *field* yang menjadi acuan. Sedangkan untuk fungsi ROW\_NUMBER digunakan untuk membuat urutan penomoran dari sebuah data berdasarkan *field* tertentu dan sifat baris datanya unik tidak ada nilai data yang sama karena berurutan.

4. Tuliskan pernyataan SELECT untuk mengambil kolom orderid, orderdate, custid, dan val serta hitung kolom bernama orderrankno dari view Sales.OrderValues. Kolom orderrankno harus menampilkan rangking per pelanggan secara independen, berdasarkan pemesanan val dalam urutan menurun!

### Jawaban:

```
-- Maulana Bintang Irfansyah - 15 - TI 2H
SELECT
    orderid, orderdate, custid, val,
    RANK() OVER (PARTITION BY custid ORDER BY val DESC) AS orderrankno
FROM Sales.OrderValues;
```

Results

Messages

|    | orderid | orderdate               | custid | val     | orderrankno |
|----|---------|-------------------------|--------|---------|-------------|
| 1  | 11011   | 2008-04-09 00:00:00.000 | 1      | 933.50  | 1           |
| 2  | 10692   | 2007-10-03 00:00:00.000 | 1      | 878.00  | 2           |
| 3  | 10836   | 2008-01-15 00:00:00.000 | 1      | 845.80  | 3           |
| 4  | 10643   | 2007-08-25 00:00:00.000 | 1      | 814.50  | 4           |
| 5  | 10952   | 2008-03-16 00:00:00.000 | 1      | 471.20  | 5           |
| 6  | 10702   | 2007-10-13 00:00:00.000 | 1      | 330.00  | 6           |
| 7  | 10926   | 2008-03-04 00:00:00.000 | 2      | 514.40  | 1           |
| 8  | 10625   | 2007-08-08 00:00:00.000 | 2      | 479.75  | 2           |
| 9  | 10759   | 2007-11-28 00:00:00.000 | 2      | 320.00  | 3           |
| 10 | 10308   | 2006-09-18 00:00:00.000 | 2      | 88.80   | 4           |
| 11 | 10573   | 2007-06-19 00:00:00.000 | 3      | 2082.00 | 1           |
| 12 | 10535   | 2007-05-13 00:00:00.000 | 3      | 1940.85 | 2           |
| 13 | 10677   | 2007-09-22 00:00:00.000 | 3      | 813.37  | 3           |
| 14 | 10507   | 2007-04-15 00:00:00.000 | 3      | 749.06  | 4           |
| 15 | 10856   | 2008-01-28 00:00:00.000 | 3      | 660.00  | 5           |
| 16 | 10365   | 2006-11-27 00:00:00.000 | 3      | 403.20  | 6           |
| 17 | 10682   | 2007-09-25 00:00:00.000 | 3      | 375.50  | 7           |
| 18 | 10953   | 2008-03-16 00:00:00.000 | 4      | 4441.25 | 1           |
| 19 | 10558   | 2007-06-04 00:00:00.000 | 4      | 2142.90 | 2           |
| 20 | 10707   | 2007-10-16 00:00:00.000 | 4      | 1641.00 | 3           |

Query executed successfully.

LAPTOP-39OHL046\DBMS2021 (1...

LAPTOP-39OHL046\Maulan...

TSQL

00:00:00

830 rows

5. Tuliskan pernyataan SELECT untuk mengambil kolom custid dan val dari view Sales.OrderValues. Tambahkan dua kolom berikut:

- orderyear sebagai tahun dari kolom orderdate
- orderrankno sebagai nomor urut, dipartisi berdasarkan pelanggan dan tahun pesanan, dan diurutkan berdasarkan nilai pesanan dalam urutan menurun!

**Jawaban:**

```
51 - Lab Exercise 1...aulana Bintang (51))
-- Maulana Bintang Irfansyah - 15 - TI 2H
SELECT
    custid, val,
    YEAR(orderdate) AS orderyear,
    RANK() OVER (PARTITION BY custid, YEAR(orderdate) ORDER BY val DESC)
    AS orderrankno
FROM Sales.OrderValues;
```

|    | custid | val     | orderyear | orderrankno |
|----|--------|---------|-----------|-------------|
| 1  | 1      | 878.00  | 2007      | 1           |
| 2  | 1      | 814.50  | 2007      | 2           |
| 3  | 1      | 330.00  | 2007      | 3           |
| 4  | 1      | 933.50  | 2008      | 1           |
| 5  | 1      | 845.80  | 2008      | 2           |
| 6  | 1      | 471.20  | 2008      | 3           |
| 7  | 2      | 88.80   | 2006      | 1           |
| 8  | 2      | 479.75  | 2007      | 1           |
| 9  | 2      | 320.00  | 2007      | 2           |
| 10 | 2      | 514.40  | 2008      | 1           |
| 11 | 3      | 403.20  | 2006      | 1           |
| 12 | 3      | 2082.00 | 2007      | 1           |
| 13 | 3      | 1940.85 | 2007      | 2           |
| 14 | 3      | 813.37  | 2007      | 3           |
| 15 | 3      | 749.06  | 2007      | 4           |
| 16 | 3      | 375.50  | 2007      | 5           |
| 17 | 3      | 660.00  | 2008      | 1           |
| 18 | 4      | 899.00  | 2006      | 1           |
| 19 | 4      | 480.00  | 2006      | 2           |
| 20 | 4      | 714.70  | 2007      | 1           |

6. Salin query jawaban soal nomor 5 dan modifikasi untuk memfilter hanya pesanan dengan dua peringkat paling awal berdasarkan kolom orderrankno!

**Jawaban:**

```
51 - Lab Exercise 1...aulana Bintang (51))*
-- Maulana Bintang Irfansyah - 15 - TI 2H
SELECT
    s.custid, s.orderyear, s.orderrankno, s.val
FROM
    (
        SELECT
            custid, val,
            YEAR(orderdate) AS orderyear,
            RANK() OVER (PARTITION BY custid, YEAR(orderdate) ORDER BY val DESC)
            AS orderrankno
        FROM Sales.OrderValues
    ) AS s
WHERE s.orderrankno <= 2;
```

Results Messages

|    | custid | orderyear | orderrankno | val     |
|----|--------|-----------|-------------|---------|
| 1  | 1      | 2007      | 1           | 878.00  |
| 2  | 1      | 2007      | 2           | 814.50  |
| 3  | 1      | 2008      | 1           | 933.50  |
| 4  | 1      | 2008      | 2           | 845.80  |
| 5  | 2      | 2006      | 1           | 88.80   |
| 6  | 2      | 2007      | 1           | 479.75  |
| 7  | 2      | 2007      | 2           | 320.00  |
| 8  | 2      | 2008      | 1           | 514.40  |
| 9  | 3      | 2006      | 1           | 403.20  |
| 10 | 3      | 2007      | 1           | 2082.00 |
| 11 | 3      | 2007      | 2           | 1940.85 |
| 12 | 3      | 2008      | 1           | 660.00  |
| 13 | 4      | 2006      | 1           | 899.00  |
| 14 | 4      | 2006      | 2           | 480.00  |
| 15 | 4      | 2007      | 1           | 2142.90 |
| 16 | 4      | 2007      | 2           | 1641.00 |
| 17 | 4      | 2008      | 1           | 4441.25 |

Query executed successfully.

LAPTOP-39OHL046\DBMS2021 (1...LAPTOP-39OHL046\Maulan...TSQL00:00:00418 rows

## Praktikum 2: Menulis Query Menggunakan Fungsi OFFSET

7. Buatlah (*common table expression*) CTE dengan nama OrderRows berdasarkan query yang mengambil kolomorderid, orderdate, and val dari view Sales.OrderValues. Tambahkan kolom hasil perhitungan dengan nama rowno menggunakan fungsi ROW\_NUMBER yang diurutkan berdasarkan kolom orderdate dan orderid!

**Jawaban:**

```
61 - Lab Exercise 2...aulana Bintang (52))* ➔ ✕
-- Maulana Bintang Irfansyah - 15 - TI 2H
WITH OrderRows AS
(
    SELECT
        orderid, orderdate,
        ROW_NUMBER() OVER (ORDER BY orderdate, orderid) AS rowno,
        val
    FROM Sales.OrderValues
)
```

8. Tuliskan pernyataan SELECT terhadap CTE dan gunakan LEFT JOIN dengan CTE yang sama untuk mengambil baris saat ini (*current row*) dan baris sebelumnya (*previous row*) berdasarkan kolom rowno. Kembalikan kolom orderid, orderdate, and val untuk baris saat ini dan kolom val untuk baris sebelumnya sebagai prevval. Tambahkan kolom hasil perhitungan dengan nama diffprev yang menunjukkan perbedaan antara val saat ini dengan sebelumnya!

**Jawaban:**

```

61 - Lab Exercise 2...aulana Bintang (52))* -# X
-- Maulana Bintang Irfansyah - 15 - TI 2H
WITH OrderRows AS
(
    SELECT
       orderid, orderdate,
        ROW_NUMBER() OVER (ORDER BY orderdate, orderid) AS rowno,
        val
    FROM Sales.OrderValues
)
SELECT
    o.orderid, o.orderdate, o.val, o2.val AS prevval,
    o.val - o2.val AS diffprev
FROM OrderRows AS o
LEFT OUTER JOIN OrderRows AS o2
ON o.rowno = o2.rowno + 1;

```

| orderid | orderdate               | val     | prevval | diffprev |
|---------|-------------------------|---------|---------|----------|
| 10248   | 2006-07-04 00:00:00.000 | 440.00  | NULL    | NULL     |
| 10249   | 2006-07-05 00:00:00.000 | 1863.40 | 440.00  | 1423.40  |
| 10250   | 2006-07-08 00:00:00.000 | 1552.60 | 1863.40 | -310.80  |
| 10251   | 2006-07-08 00:00:00.000 | 654.06  | 1552.60 | -898.54  |
| 10252   | 2006-07-09 00:00:00.000 | 3597.90 | 654.06  | 2943.84  |
| 10253   | 2006-07-10 00:00:00.000 | 1444.80 | 3597.90 | -2153.10 |
| 10254   | 2006-07-11 00:00:00.000 | 556.62  | 1444.80 | -888.18  |
| 10255   | 2006-07-12 00:00:00.000 | 2490.50 | 556.62  | 1933.88  |
| 10256   | 2006-07-15 00:00:00.000 | 517.80  | 2490.50 | -1972.70 |
| 10257   | 2006-07-16 00:00:00.000 | 1119.90 | 517.80  | 602.10   |
| 10258   | 2006-07-17 00:00:00.000 | 1614.88 | 1119.90 | 494.98   |
| 10259   | 2006-07-18 00:00:00.000 | 100.80  | 1614.88 | -1514.08 |
| 10260   | 2006-07-19 00:00:00.000 | 1504.65 | 100.80  | 1403.85  |
| 10261   | 2006-07-19 00:00:00.000 | 448.00  | 1504.65 | -1056.65 |
| 10262   | 2006-07-22 00:00:00.000 | 584.00  | 448.00  | 136.00   |
| 10263   | 2006-07-23 00:00:00.000 | 1873.80 | 584.00  | 1289.80  |
| 10264   | 2006-07-24 00:00:00.000 | 695.63  | 1873.80 | -1178.17 |

Query executed successfully. LAPTOP-39OHL046\DBMS2021 (1... LAPTOP-39OHL046\Maulan... TSQL 00:00:05 830 rows

9. Tuliskan pernyataan SELECT menggunakan fungsi LAG untuk mendapat hasil yang sama dengan query pada soal no.2! Query tidak yang dibuat pada soal ini tidak menggunakan CTE.

**Jawaban:**

```

61 - Lab Exercise 2...aulana Bintang (60))* -# X
-- Maulana Bintang Irfansyah - 15 - TI 2H
SELECT
   orderid, orderdate, val,
    LAG(val) OVER (ORDER BY orderdate, orderid) AS prevval,
    val - LAG(val) OVER (ORDER BY orderdate, orderid) AS diffprev
FROM Sales.OrderValues;

```

| orderid | orderdate               | val     | prevval | diffprev |
|---------|-------------------------|---------|---------|----------|
| 10248   | 2006-07-04 00:00:00.000 | 440.00  | NULL    | NULL     |
| 10249   | 2006-07-05 00:00:00.000 | 1863.40 | 440.00  | 1423.40  |
| 10250   | 2006-07-08 00:00:00.000 | 1552.60 | 1863.40 | -310.80  |
| 10251   | 2006-07-08 00:00:00.000 | 654.06  | 1552.60 | -898.54  |
| 10252   | 2006-07-09 00:00:00.000 | 3597.90 | 654.06  | 2943.84  |
| 10253   | 2006-07-10 00:00:00.000 | 1444.80 | 3597.90 | -2153.10 |
| 10254   | 2006-07-11 00:00:00.000 | 556.62  | 1444.80 | -888.18  |
| 10255   | 2006-07-12 00:00:00.000 | 2490.50 | 556.62  | 1933.88  |
| 10256   | 2006-07-15 00:00:00.000 | 517.80  | 2490.50 | -1972.70 |
| 10257   | 2006-07-16 00:00:00.000 | 1119.90 | 517.80  | 602.10   |
| 10258   | 2006-07-17 00:00:00.000 | 1614.88 | 1119.90 | 494.98   |
| 10259   | 2006-07-18 00:00:00.000 | 100.80  | 1614.88 | -1514.08 |
| 10260   | 2006-07-19 00:00:00.000 | 1504.65 | 100.80  | 1403.85  |
| 10261   | 2006-07-19 00:00:00.000 | 448.00  | 1504.65 | -1056.65 |
| 10262   | 2006-07-22 00:00:00.000 | 584.00  | 448.00  | 136.00   |
| 10263   | 2006-07-23 00:00:00.000 | 1873.80 | 584.00  | 1289.80  |
| 10264   | 2006-07-24 00:00:00.000 | 695.63  | 1873.80 | -1178.17 |

Query executed successfully. LAPTOP-39OHL046\DBMS2021 (1... LAPTOP-39OHL046\Maulan... TSQL 00:00:00 830 rows

10. Buatlah sebuah CTE bernama SalesMonth2007 yang membuat dua kolom yaitu, monthno (jumlah bulan dari kolom orderdate) dan val (agregat dari kolom val)! Kemudian filter hasilnya hanya untuk tahun pesanan 2007 dan dikelompokkan berdasarkan monthno!

**Jawaban:**

```
61 - Lab Exercise 2...aulana Bintang (60))* ✕
-- Maulana Bintang Irfansyah - 15 - TI 2H
WITH SalesMonth2007 AS
(
    SELECT
        MONTH(orderdate) AS monthno,
        SUM(val) AS val
    FROM Sales.OrderValues
    WHERE orderdate >= '20070101' AND orderdate < '20080101'
    GROUP BY MONTH(orderdate)
)
SELECT
```

11. Tuliskan pernyataan SELECT yang akan mengambil kolom monthno dan val dari CTE dan tambahkan 3 kolom untuk ditampilkan, yaitu :

- avglast3months (jumlah penjualan rata-rata tiga bulan terakhir)
- diffjanuary (perbedaan antara val saat ini dengan val pada bulan januari, gunakan fungsi FIRST\_VALUE)
- nextval (nilai dari kolom val pada bulan selanjutnya)

Informasi: Jumlah rata-rata untuk tiga bulan terakhir tidak dihitung dengan benar karena jumlah total 2 bulan pertama dibagi dengan 3.

**Jawaban:**

```
61 - Lab Exercise 2...aulana Bintang (60))* ✕
-- Maulana Bintang Irfansyah - 15 - TI 2H
WITH SalesMonth2007 AS
(
    SELECT
        MONTH(orderdate) AS monthno,
        SUM(val) AS val
    FROM Sales.OrderValues
    WHERE orderdate >= '20070101' AND orderdate < '20080101'
    GROUP BY MONTH(orderdate)
)
SELECT
    monthno, val, (LAG(val, 1, 0) OVER (ORDER BY monthno) + LAG(val, 2, 0) OVER (ORDER BY monthno) +
        LAG(val, 3, 0) OVER (ORDER BY monthno)) / 3 AS avglast3months,
    val - FIRST_VALUE(val) OVER (ORDER BY monthno ROWS UNBOUNDED PRECEDING) AS diffjanuary,
    LEAD(val) OVER (ORDER BY monthno) AS nextval
FROM SalesMonth2007;
```

| monthno | val      | avglast3months | diffjanuary | nextval  |
|---------|----------|----------------|-------------|----------|
| 1       | 61258.08 | 0.000000       | 0.00        | 38483.64 |
| 2       | 38483.64 | 20419.360000   | -22774.44   | 38547.23 |
| 3       | 38547.23 | 33247.240000   | -22719.85   | 53032.95 |
| 4       | 53032.95 | 48096.316666   | -8225.13    | 53781.30 |
| 5       | 53781.30 | 43354.606666   | -7476.78    | 36362.82 |
| 6       | 36362.82 | 48453.826666   | -24895.26   | 51020.86 |
| 7       | 51020.86 | 47725.690000   | -10237.22   | 47287.68 |
| 8       | 47287.68 | 47054.993333   | -13970.40   | 55629.27 |
| 9       | 55629.27 | 44890.453333   | -5628.81    | 66749.23 |
| 10      | 66749.23 | 51312.603333   | 5491.15     | 43533.80 |
| 11      | 43533.80 | 56555.393333   | -17724.28   | 71398.44 |
| 12      | 71398.44 | 55304.100000   | 10140.36    | NULL     |

Query executed successfully.

### Praktikum 3: Menulis Query Menggunakan Fungsi Agregasi Window

12. Tuliskan pernyataan SELECT untuk mengambil kolom custid,orderid, orderdate, dan val dari view Sales.OrderValues. Tambahkan kolom bernama percoftotalcust yang berisi persentase nilai masing-masing jumlah pesanan penjualan dibandingkan dengan jumlah penjualan untuk pelanggan tersebut!

**Jawaban:**

```
-- Maulana Bintang Irfansyah - 15 - TI 2H
SELECT
    custid, orderid, orderdate, val,
    100. * val / SUM(val) OVER (PARTITION BY custid) AS percoftotalcust
FROM Sales.OrderValues
ORDER BY custid, percoftotalcust DESC;
```

Results

Messages

|    | custid | orderid | orderdate               | val     | percoftotalcust           |
|----|--------|---------|-------------------------|---------|---------------------------|
| 1  | 1      | 11011   | 2008-04-09 00:00:00.000 | 933.50  | 21.8464778843903580622513 |
| 2  | 1      | 10692   | 2007-10-03 00:00:00.000 | 878.00  | 20.5476246197051252047741 |
| 3  | 1      | 10835   | 2008-01-15 00:00:00.000 | 845.80  | 19.7940556985724315469225 |
| 4  | 1      | 10643   | 2007-08-25 00:00:00.000 | 814.50  | 19.0615492628130119354083 |
| 5  | 1      | 10952   | 2008-03-16 00:00:00.000 | 471.20  | 11.0273812309852562602387 |
| 6  | 1      | 10702   | 2007-10-13 00:00:00.000 | 330.00  | 7.72291130353381699904048 |
| 7  | 2      | 10026   | 2008-03-04 00:00:00.000 | 514.40  | 36.6856974910011048148544 |
| 8  | 2      | 10625   | 2007-08-08 00:00:00.000 | 479.75  | 34.1958017035532271285505 |
| 9  | 2      | 10799   | 2007-11-28 00:00:00.000 | 320.00  | 22.8090808653195053280587 |
| 10 | 2      | 10308   | 2006-09-18 00:00:00.000 | 88.80   | 6.3295199401261627285362  |
| 11 | 3      | 10573   | 2007-06-19 00:00:00.000 | 2082.00 | 29.6413144684352745879116 |
| 12 | 3      | 10535   | 2007-05-13 00:00:00.000 | 1940.85 | 27.6317700221242087819156 |
| 13 | 3      | 10677   | 2007-06-22 00:00:00.000 | 813.37  | 11.5799019928872234828625 |
| 14 | 3      | 10507   | 2007-04-15 00:00:00.000 | 749.08  | 10.6643242150461704048132 |
| 15 | 3      | 10856   | 2008-01-28 00:00:00.000 | 660.00  | 9.3963821081495106762832  |
| 16 | 3      | 10365   | 2006-11-27 00:00:00.000 | 403.20  | 5.7403352515240647040566  |
| 17 | 3      | 10682   | 2007-09-25 00:00:00.000 | 375.50  | 5.3459718418335473620369  |

Query executed successfully.

LAPTOP-39OHL046\DBMS2021 (1... LAPTOP-39OHL046\Maulan... TSQL 00:00:00 830 rows

13. Salin pernyataan SELECT sebelumnya dan modifikasi dengan menambahkan kolom yang baru dihitung bernama runval! Kolom ini harus berisi total penjualan yang sedang terjadi untuk setiap pelanggan berdasarkan tanggal pemesanan, menggunakan orderid sebagai tiebreaker.

**Jawaban:**



```

71 - Lab Exercise 3...aulana Bintang (58))* ➦ ✕
-- Maulana Bintang Irfansyah - 15 - TI 2H
SELECT
    custid,orderid,orderdate, val,
    100. * val / SUM(val) OVER (PARTITION BY custid) AS percoftotalcust,
    SUM(val) OVER (PARTITION BY custid ORDER BY orderdate, orderid
                    ROWS BETWEEN UNBOUNDED PRECEDING AND CURRENT ROW) AS runval
FROM Sales.OrderValues;

```

| Results |        | Messages |                         |         |                           |         |
|---------|--------|----------|-------------------------|---------|---------------------------|---------|
|         | custid | orderid  | orderdate               | val     | percoftotalcust           | runval  |
| 1       | 1      | 10643    | 2007-08-25 00:00:00.000 | 814.50  | 19.0615492628130119354083 | 814.50  |
| 2       | 1      | 10692    | 2007-10-03 00:00:00.000 | 878.00  | 20.5476246197051252047741 | 1692.50 |
| 3       | 1      | 10702    | 2007-10-13 00:00:00.000 | 330.00  | 7.7229113035338169904048  | 2022.50 |
| 4       | 1      | 10835    | 2008-01-15 00:00:00.000 | 845.80  | 19.7940556985724315469225 | 2868.30 |
| 5       | 1      | 10952    | 2008-03-16 00:00:00.000 | 471.20  | 11.0273812309852562602387 | 3339.50 |
| 6       | 1      | 11011    | 2008-04-09 00:00:00.000 | 933.50  | 21.8464778843903580622513 | 4273.00 |
| 7       | 2      | 10308    | 2006-09-18 00:00:00.000 | 88.80   | 6.3295199401261627285362  | 88.80   |
| 8       | 2      | 10625    | 2007-08-08 00:00:00.000 | 479.75  | 34.1958017035532271285505 | 568.55  |
| 9       | 2      | 10759    | 2007-11-28 00:00:00.000 | 320.00  | 22.8090808653195053280587 | 888.55  |
| 10      | 2      | 10926    | 2008-03-04 00:00:00.000 | 514.40  | 36.6655974910011048148544 | 1402.95 |
| 11      | 3      | 10365    | 2006-11-27 00:00:00.000 | 403.20  | 5.7403352515240647040566  | 403.20  |
| 12      | 3      | 10507    | 2007-04-15 00:00:00.000 | 749.06  | 10.664324150461704048132  | 1152.26 |
| 13      | 3      | 10535    | 2007-05-13 00:00:00.000 | 1940.85 | 27.6317700221242087819156 | 3093.11 |
| 14      | 3      | 10573    | 2007-06-19 00:00:00.000 | 2082.00 | 29.6413144684352745879116 | 5175.11 |
| 15      | 3      | 10677    | 2007-09-22 00:00:00.000 | 813.37  | 11.5799019928872234829825 | 5988.48 |
| 16      | 3      | 10682    | 2007-09-25 00:00:00.000 | 375.50  | 5.3459719418335473620369  | 6363.98 |
| 17      | 3      | 10856    | 2008-01-28 00:00:00.000 | 660.00  | 9.3963821081495106762832  | 7023.98 |

Query executed successfully.

LAPTOP-39OHL046\DBMS2021 (1... LAPTOP-39OHL046\Maulan... TSQL 00:00:00 830 rows

14. Salin CTE SalesMonth2007 dalam percobaan 2. Tuliskan pernyataan SELECT untuk mengambil kolom monthno dan val. Tambahkan dua kolom yang dihitung:

- avglast3months. Kolom ini harus berisi jumlah penjualan rata-rata untuk tiga bulan terakhir sebelum bulan saat ini menggunakan fungsi window agregat. Asumsikan bahwa tidak ada missing months.
- ytdval Kolom ini harus berisi nilai penjualan kumulatif sampai dengan bulan saat ini.

**Jawaban:**

```

71 - Lab Exercise 3...aulana Bintang (58))* ➦ ✕
-- Maulana Bintang Irfansyah - 15 - TI 2H
WITH SalesMonth2007 AS
(
    SELECT
        MONTH(orderdate) AS monthno,
        SUM(val) AS val
    FROM Sales.OrderValues
    WHERE orderdate >= '20070101' AND orderdate < '20080101'
    GROUP BY MONTH(orderdate)
)
SELECT
    monthno, val,
    AVG(val) OVER (ORDER BY monthno ROWS BETWEEN 3 PRECEDING AND CURRENT ROW)
    AS avglast3months,
    SUM(val) OVER (ORDER BY monthno ROWS BETWEEN UNBOUNDED PRECEDING AND CURRENT ROW)
    AS ytdval
FROM SalesMonth2007;

```

| Results Messages |         |          |                |           |
|------------------|---------|----------|----------------|-----------|
|                  | monthno | val      | avglast3months | ytdval    |
| 1                | 1       | 61258.08 | 61258.080000   | 61258.08  |
| 2                | 2       | 38483.64 | 49870.860000   | 99741.72  |
| 3                | 3       | 38547.23 | 46096.316666   | 138288.95 |
| 4                | 4       | 53032.95 | 47830.475000   | 191321.90 |
| 5                | 5       | 53781.30 | 45961.280000   | 245103.20 |
| 6                | 6       | 36362.82 | 45431.075000   | 281466.02 |
| 7                | 7       | 51020.86 | 48549.482500   | 332486.88 |
| 8                | 8       | 47287.68 | 47113.165000   | 379774.56 |
| 9                | 9       | 55629.27 | 47575.157500   | 435403.83 |
| 10               | 10      | 66749.23 | 55171.760000   | 502153.06 |
| 11               | 11      | 43533.80 | 53299.995000   | 545686.86 |
| 12               | 12      | 71398.44 | 59327.685000   | 617085.30 |

Query executed successfully. LAPTOP-39OHL046\DBMS2021 (1... LAPTOP-39OHL046\Maulan... TSQL 00:00:00 12 rows