# JOBSHEET

## PRAKTIKUM BASIS DATA LANJUT

**Jurusan Teknologi Informasi**

**POLITEKNIK NEGERI MALANG**

## Week 7

**SQL SERVER - Window Ranking, Offset, Fungsi Agregat**

Information Technology Department, State Polytechnic of Malang **Jobsheet Week -7 : Window Ranking, Offset, Aggregate Function Advanced Database Course (BDL)**

Supervisor: Database Teaching Team

# SAFRIZAL RAHMAN_19_SIB_2G

## Topics

1. Create a Window with OVER
2. Conducting Function exploration Windows

## Objective

1. Students understand how to explain the T-SQL components used to define windows and the relationship between the two. the
2. Students understand how to write queries using the OVER clause with *partitioning* , *ordering* , and *framing* to define window
3. Students understand how to write queries using window functions. aggregate
4. Students understand how to write queries using window functions. ranking
5. Students understand how to write queries using window functions. offset

## General Instructions

1. Follow the steps in the practical sections in the order given. given.
2. You can use SQL Server 2012 Standard Edition to try the practicum on this jobsheet. Adjust it to your computer's condition. You.
3. Answer all questions marked [Question-X] found in the specific steps in each section. practicum.
4. In each step of the practicum there is an explanation that will help you answer the questions in instruction number 3, so read and do all the practicum parts in the jobsheet. This.
5. Write the answers to the questions in the instructions number 3 in a report that is done using a word processing application (Word, OpenOffice, or other similar). Export as a **PDF file** with the name format as following:
   - **BDL_09_Your_Full_Name_Class** .pdf - Example:
     - **BDL_09_TI2U_Mukiyo** .pdf
   - Pay close attention to the format its naming.
   - Collect the PDF files as a practical report to the lecturer. guardian.
   - In addition to the file name, also include your identity on the first page of the report. the.

## Lab – Part 1: Writing Queries Using the RANKING Function

| **Step** | **Information** |
|---|---|

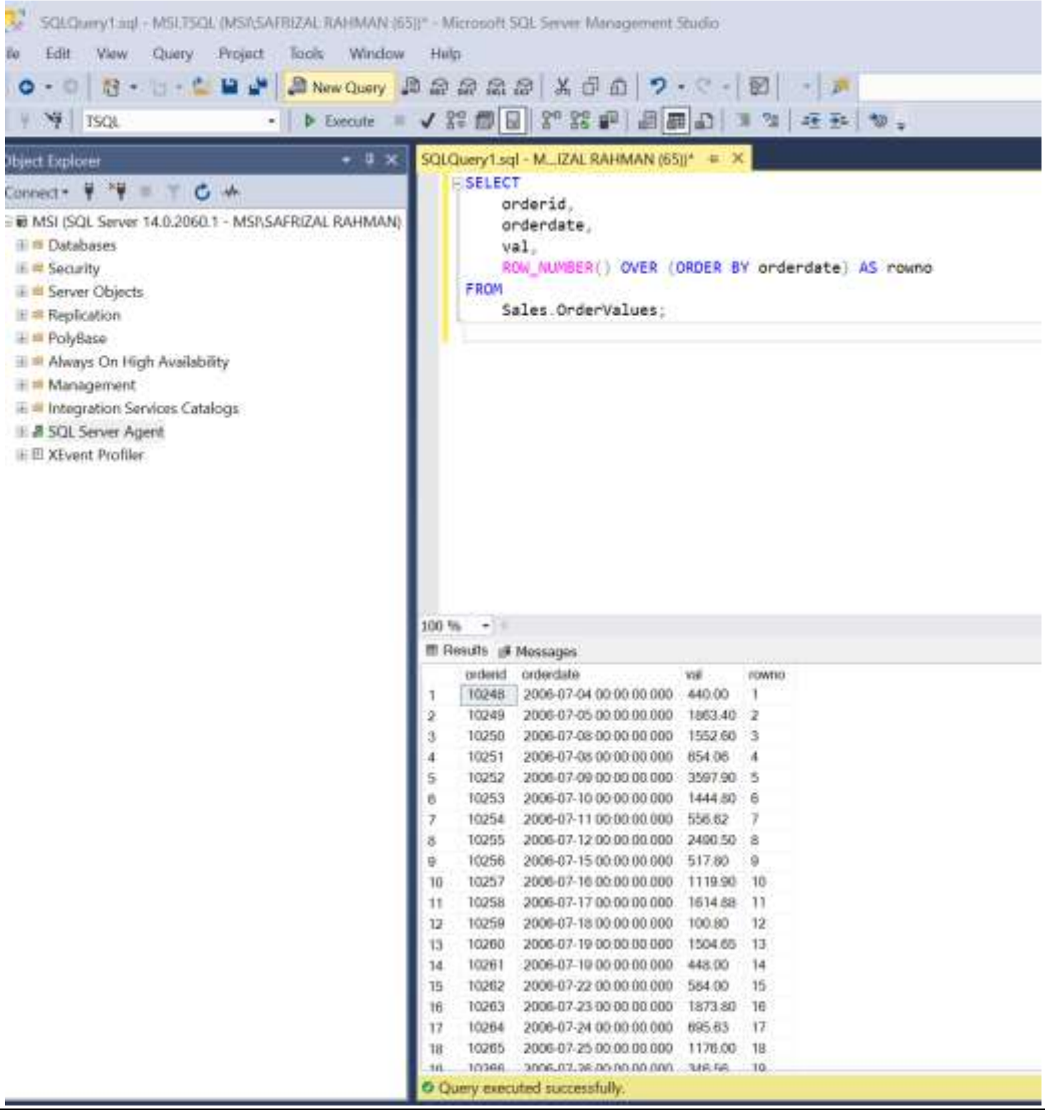
**1**

Scenario :
The sales department wants to determine the order based on the value of each customer. To do this, it is necessary to report using the RANK function (including a calculation result column that adds a calculation result column to display the row number with the SELECT clause).

To do the experiment in this practicum part 1, first log in to SQL Server Management Studio (SSMS). Make sure the database is connected to “TSQL”.

**2**

[Question-1] Write a SELECT statement to retrieve the orderid, orderdate, and val columns and a calculated column named rowno from the Sales.OrderValues view! Use the ROW_NUMBER function to return the rowno, sort the row numbers by the orderdate


SQLQuery1.sql - MSI.TSQL (MSI\SAFRIZAL RAHMAN (65))* - Microsoft SQL Server Management Studio
File
Edit
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Object Explorer
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Server Objects
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PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent
XEvent Profiler
SQLQuery1.sql - M...IZAL RAHMAN (65))*
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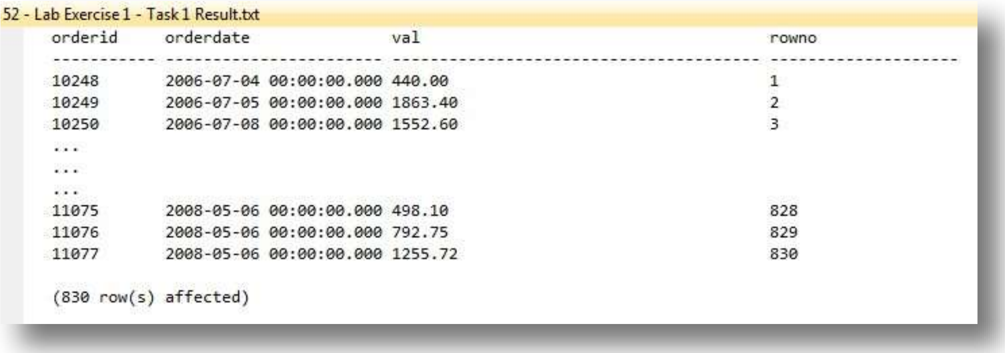
Results
Messages

```
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
```

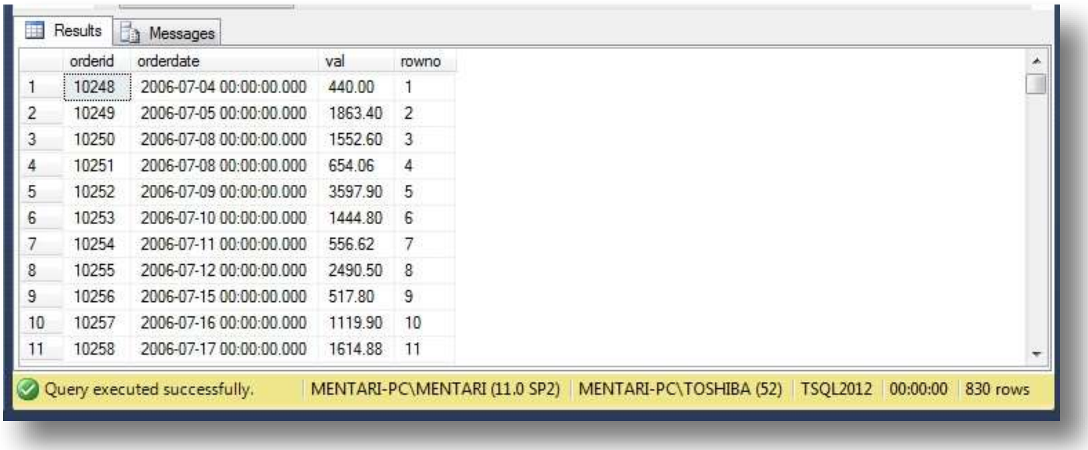
Query executed successfully.



52 - Lab Exercise 1 - Task 1 Result.txt

```
orderid     orderdate               val                                     rowno
----------- ----------------------- --------------------------------------- --------------------
10248       2006-07-04 00:00:00.000 440.00                                  1
10249       2006-07-05 00:00:00.000 1863.40                                 2
10250       2006-07-08 00:00:00.000 1552.60                                 3
...
...
...
11075       2008-05-06 00:00:00.000 498.10                                  828
11076       2008-05-06 00:00:00.000 792.75                                  829
11077       2008-05-06 00:00:00.000 1255.72                                 830

(830 row(s) affected)
```



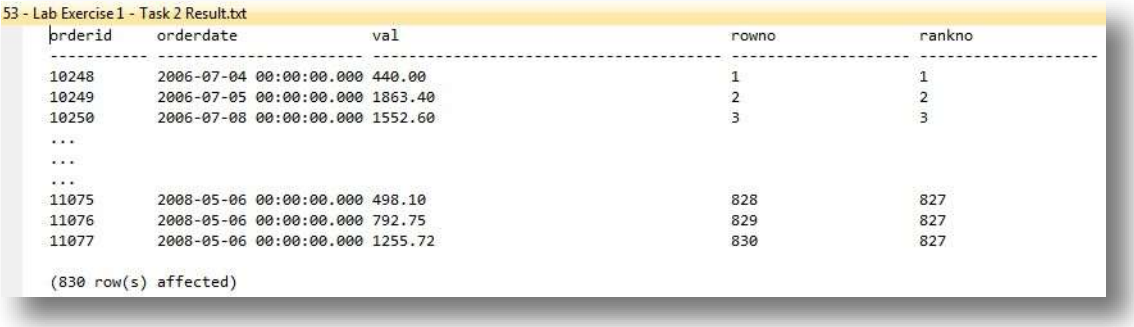
| | orderid | orderdate | val | rowno |
|---|---|---|---|---|
| 1 | 10248 | 2006-07-04 00:00:00.000 | 440.00 | 1 |
| 2 | 10249 | 2006-07-05 00:00:00.000 | 1863.40 | 2 |
| 3 | 10250 | 2006-07-08 00:00:00.000 | 1552.60 | 3 |
| 4 | 10251 | 2006-07-08 00:00:00.000 | 654.06 | 4 |
| 5 | 10252 | 2006-07-09 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 |

Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 830 rows

column!

**3**

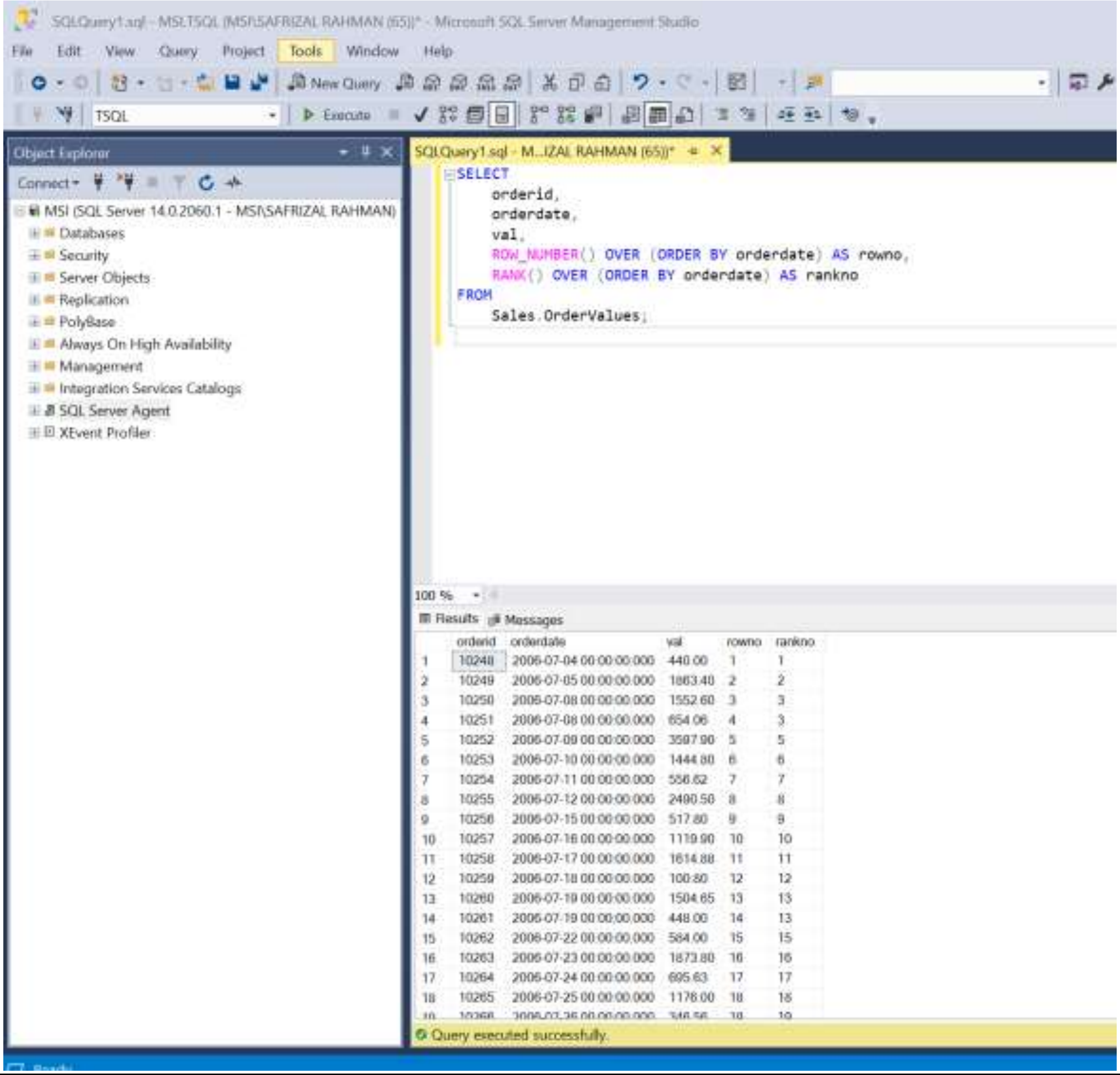
[Question-2] Copy the T-SQL in question no. 1. Then modify it by inserting an additional column named rankno. To create rankno, use the RANK function with the ranking order based on the orderdate column!



53 - Lab Exercise 1 - Task 2 Result.txt

```
orderid     orderdate               val                                     rowno                rankno
----------- ----------------------- --------------------------------------- -------------------- --------------------
10248       2006-07-04 00:00:00.000 440.00                                  1                    1
10249       2006-07-05 00:00:00.000 1863.40                                 2                    2
10250       2006-07-08 00:00:00.000 1552.60                                 3                    3
...
...
...
11075       2008-05-06 00:00:00.000 498.10                                  828                  827
11076       2008-05-06 00:00:00.000 792.75                                  829                  827
11077       2008-05-06 00:00:00.000 1255.72                                 830                  827

(830 row(s) affected)
```

 
SQLQuery1.sql - MSI.TSQL (MSI\SAFRIZAL RAHMAN (65))* - Microsoft SQL Server Management Studio
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New Query
TSQL
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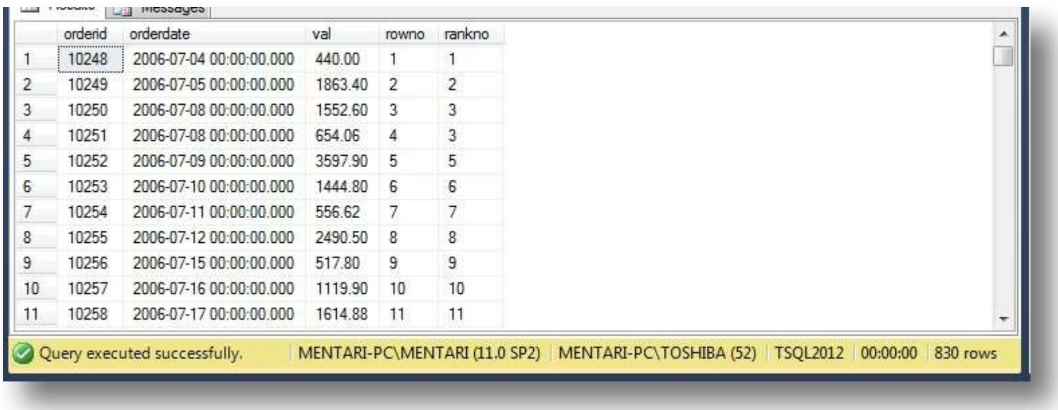
Object Explorer
Connect
MSI (SQL Server 14.0.2060.1 - MSI\SAFRIZAL RAHMAN)
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent
XEvent Profiler
SQLQuery1.sql - M...IZAL RAHMAN (65))*
100 %
Results
Messages

```sql
SELECT
    orderid,
    orderdate,
    val,
    ROW_NUMBER() OVER (ORDER BY orderdate) AS rowno,
    RANK() OVER (ORDER BY orderdate) AS rankno
FROM
    Sales.OrderValues;
```

| | 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 |

Query executed successfully.



| | 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 |

Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 830 rows

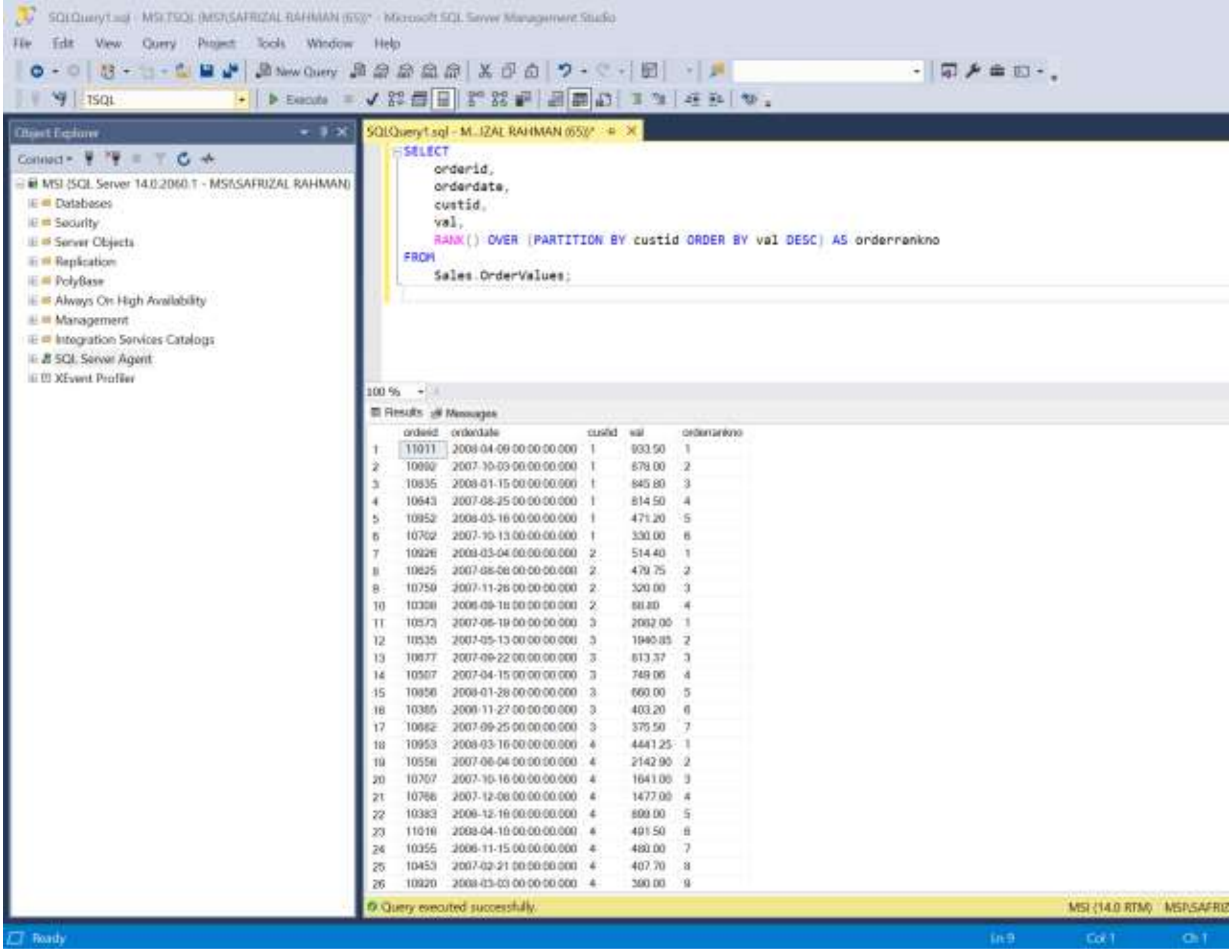
**4** [Question-3] What is the difference between the RANK function and the ROW_NUMBER function?

**ROW_NUMBER() generates a unique sequential number for each row in the result set, even if there are ties based on the ordering criteria.**

**RANK() assigns the same rank to rows with identical values in the ordering column, meaning it can skip ranks if there are ties. For example, if two rows are tied for rank 1, the next rank will be 3 (not 2).**

5

[Question-4] Write a SELECT statement to retrieve the orderid, orderdate, custid, and val columns and calculate a column named orderrankno from the Sales.OrderValues view. The orderrankno column should display the ranking per customer independently, based on the



SQLQuery1.sql - MSI.TSQL (MSI\SAFRIZAL RAHMAN (65))* - Microsoft SQL Server Management Studio
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SQL Server Agent
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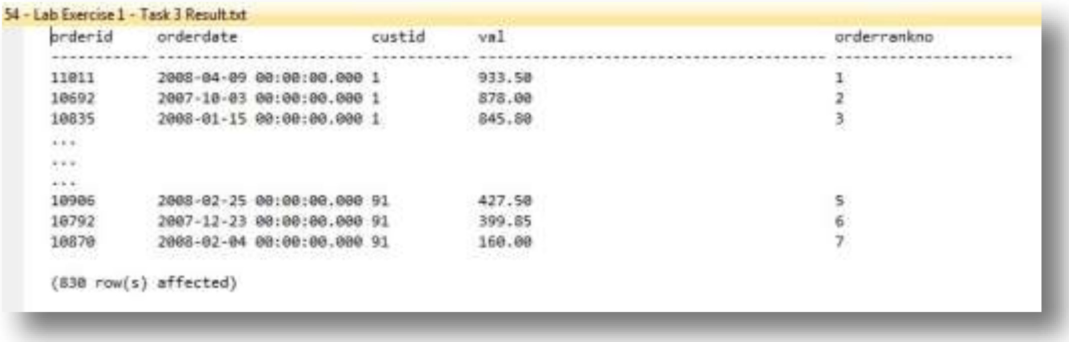
Col 1
Ch 1

```sql
SELECT
    orderid,
    orderdate,
    custid,
    val,
    RANK() OVER (PARTITION BY custid ORDER BY val DESC) AS orderrankno
FROM
    Sales.OrderValues;
```

| | 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 | 10835 | 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 |
| 21 | 10768 | 2007-12-08 00:00:00.000 | 4 | 1477.00 | 4 |
| 22 | 10383 | 2006-12-16 00:00:00.000 | 4 | 899.00 | 5 |
| 23 | 11016 | 2008-04-10 00:00:00.000 | 4 | 491.50 | 6 |
| 24 | 10355 | 2006-11-15 00:00:00.000 | 4 | 480.00 | 7 |
| 25 | 10453 | 2007-02-21 00:00:00.000 | 4 | 407.70 | 8 |
| 26 | 10920 | 2008-03-03 00:00:00.000 | 4 | 390.00 | 9 |

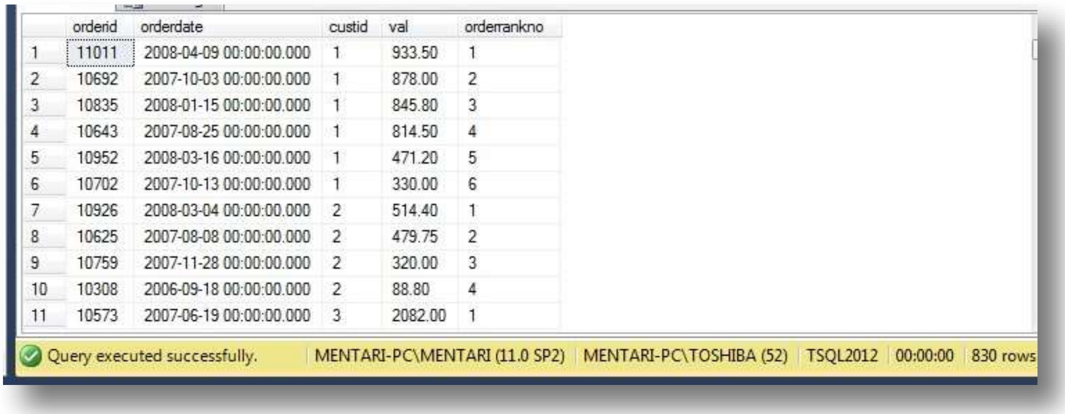
Query executed successfully.



54 - Lab Exercise 1 - Task 3 Result.txt

```
orderid     orderdate               custid      val                                      orderrankno
----------- ----------------------- ----------- ---------------------------------------- --------------------
11011       2008-04-09 00:00:00.000 1           933.50                                   1
10692       2007-10-03 00:00:00.000 1           878.00                                   2
10835       2008-01-15 00:00:00.000 1           845.80                                   3
...
...
...
10906       2008-02-25 00:00:00.000 91          427.50                                   5
10792       2007-12-23 00:00:00.000 91          399.85                                   6
10870       2008-02-04 00:00:00.000 91          160.00                                   7

(830 row(s) affected)
```



|  | 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 | 10835 | 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 |

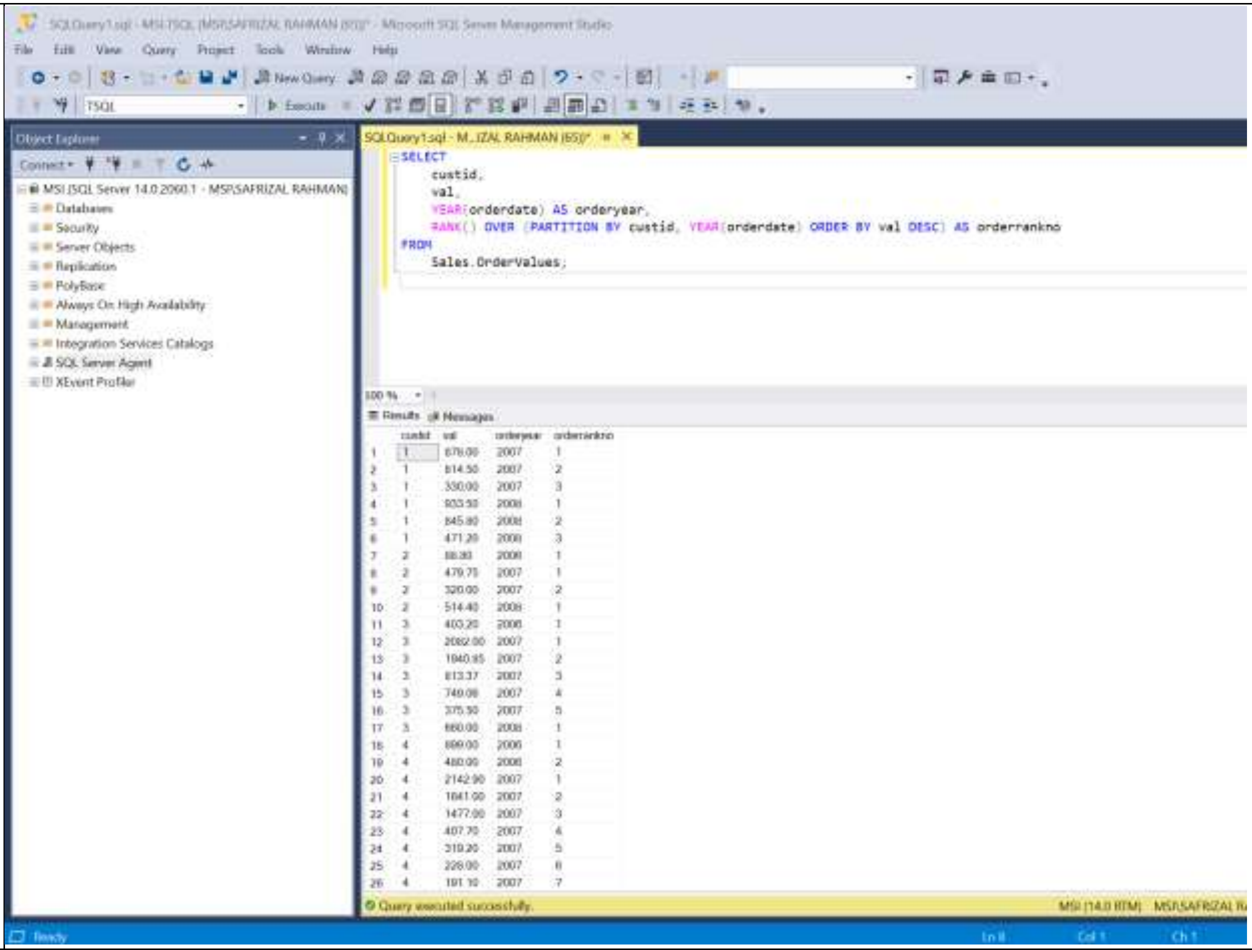
Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 830 rows

ordering of val in descending order!

6

[Question-5] Write a SELECT statement to retrieve the custid and val columns from the Sales.OrderValues view. Add the following two columns:

1) orderyear as the year of the column order date
2) orderrankno as a sequence number, partitioned by customer and order year, and sorted by order value in descending order. decrease!


SQLQuery1.sql - MSI.TSQL (MSI\SAFRIZAL RAHMAN (65))* - Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Help
New Query
TSQL
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PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent
XEvent Profiler
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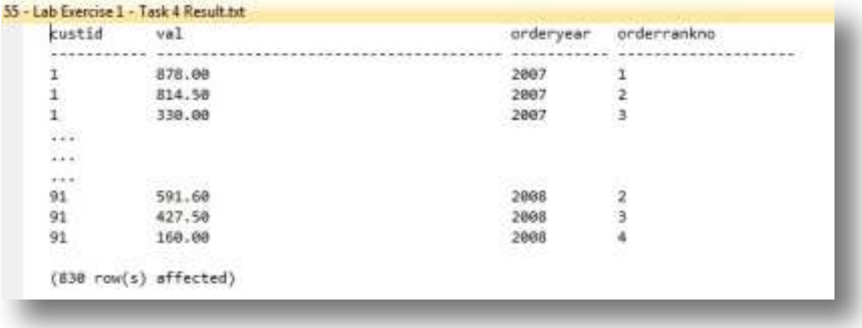
```sql
SELECT
    custid,
    val,
    YEAR(orderdate) AS orderyear,
    RANK() OVER (PARTITION BY custid, YEAR(orderdate) ORDER BY val DESC) AS orderrankno
FROM
    Sales.OrderValues;
```

```
    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       2142.90  2007       1
21  4       1941.00  2007       2
22  4       1477.00  2007       3
23  4       407.70   2007       4
24  4       319.20   2007       5
25  4       228.00   2007       6
26  4       191.10   2007       7
```

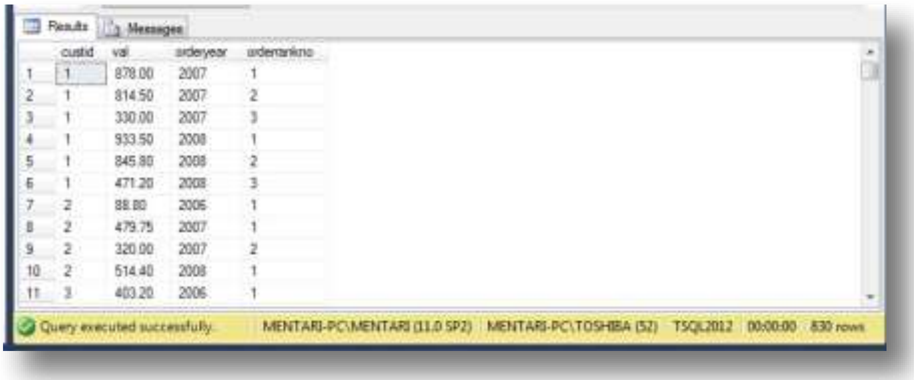
Query executed successfully.



55 - Lab Exercise 1 - Task 4 Result.txt

```
custid      val                                   orderyear   orderrankno
----------- ------------------------------------- ----------- --------------------
1           878.00                                2007        1
1           814.50                                2007        2
1           330.00                                2007        3
...
...
...
91          591.60                                2008        2
91          427.50                                2008        3
91          160.00                                2008        4

(830 row(s) affected)
```

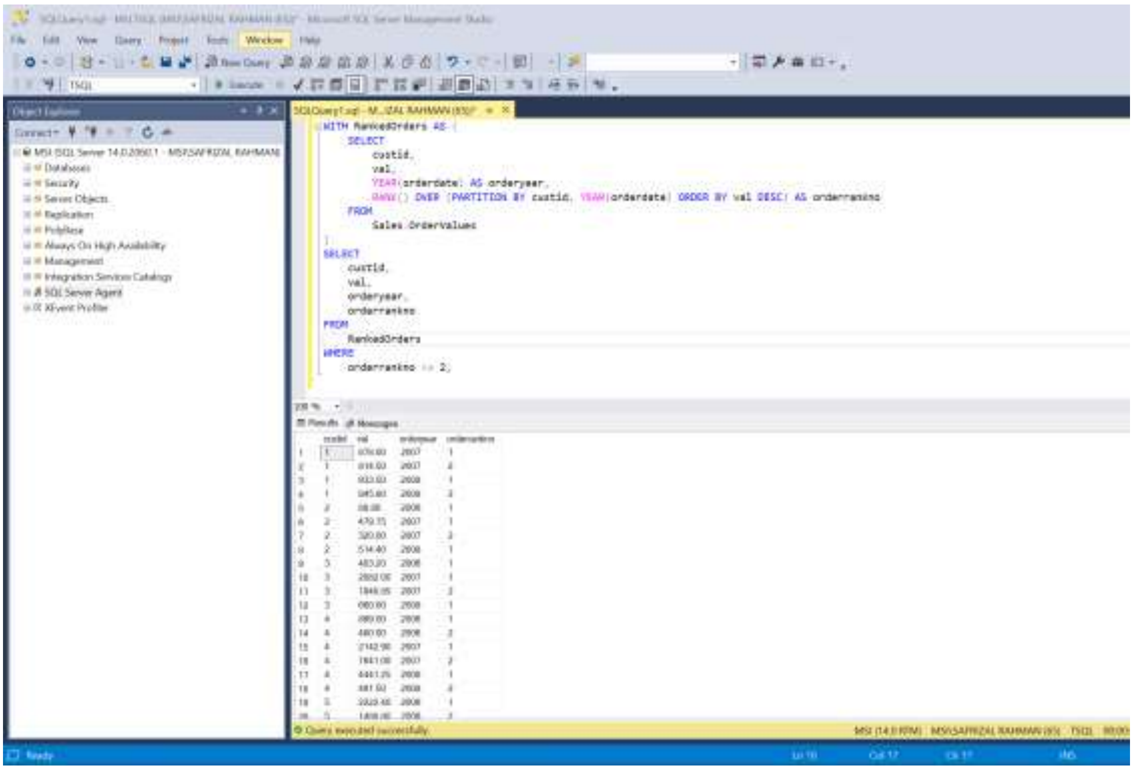


```
    custid  val     orderyear  orderrankno
1   1       878.00  2007       1
2   1       814.50  2007       2
3   1       330.00  2007       3
4   1       933.50  2008       1
5   1       845.80  2008       2
6   1       471.20  2008       3
7   2       88.80   2006       1
8   2       479.75  2007       1
9   2       320.00  2007       2
10  2       514.40  2008       1
11  3       403.20  2006       1
```

Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 830 rows

7

[Question-6] Copy the query answer to question number 6 And modification to filter only orders with the first two ranks based on column orderrankno!



```sql
WITH RankedOrders AS (
    SELECT
        custid,
        val,
        YEAR(orderdate) AS orderyear,
        RANK() OVER (PARTITION BY custid, YEAR(orderdate) ORDER BY val DESC) AS orderrankno
    FROM
        Sales.OrderValues
)
SELECT
    custid,
    val,
    orderyear,
    orderrankno
FROM
    RankedOrders
WHERE
    orderrankno <= 2;
```

| | custid | val | orderyear | orderrankno |
|---|---|---|---|---|
| 1 | 1 | 878.00 | 2007 | 1 |
| 2 | 1 | 814.50 | 2007 | 2 |
| 3 | 1 | 933.50 | 2008 | 1 |
| 4 | 1 | 845.80 | 2008 | 2 |
| 5 | 2 | 88.80 | 2006 | 1 |
| 6 | 2 | 479.75 | 2007 | 1 |
| 7 | 2 | 320.00 | 2007 | 2 |
| 8 | 2 | 514.40 | 2008 | 1 |
| 9 | 3 | 403.20 | 2006 | 1 |
| 10 | 3 | 2082.00 | 2007 | 1 |
| 11 | 3 | 1940.85 | 2007 | 2 |
| 12 | 3 | 660.00 | 2008 | 1 |
| 13 | 4 | [illegible] | 2008 | 1 |
| 14 | 4 | 480.00 | 2008 | 2 |
| 15 | 4 | 2142.90 | 2007 | 1 |
| 16 | 4 | 1941.00 | 2007 | 2 |
| 17 | 4 | 4441.25 | 2008 | 1 |
| 18 | 4 | [illegible] | 2008 | 2 |
| 19 | 5 | [illegible] | 2008 | 1 |
| 20 | 5 | 1408.00 | 2008 | 2 |

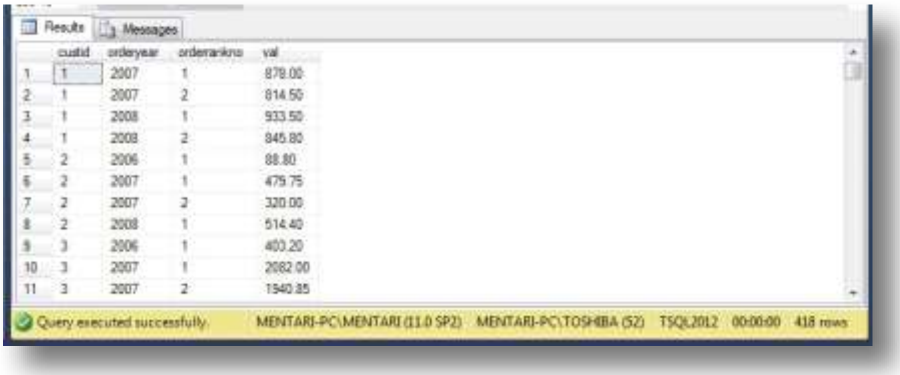
Query executed successfully.

Ready

56 - Lab Exercise 1 - Task 5 Result.txt

```
custid      orderyear   orderrankno          val
----------- ----------- -------------------- ---------------------------------------
1           2007        1                    878.00
1           2007        2                    814.50
1           2008        1                    933.50
...
...
...
91          2007        2                    399.85
91          2008        1                    686.00
91          2008        2                    591.60

(418 row(s) affected)
```



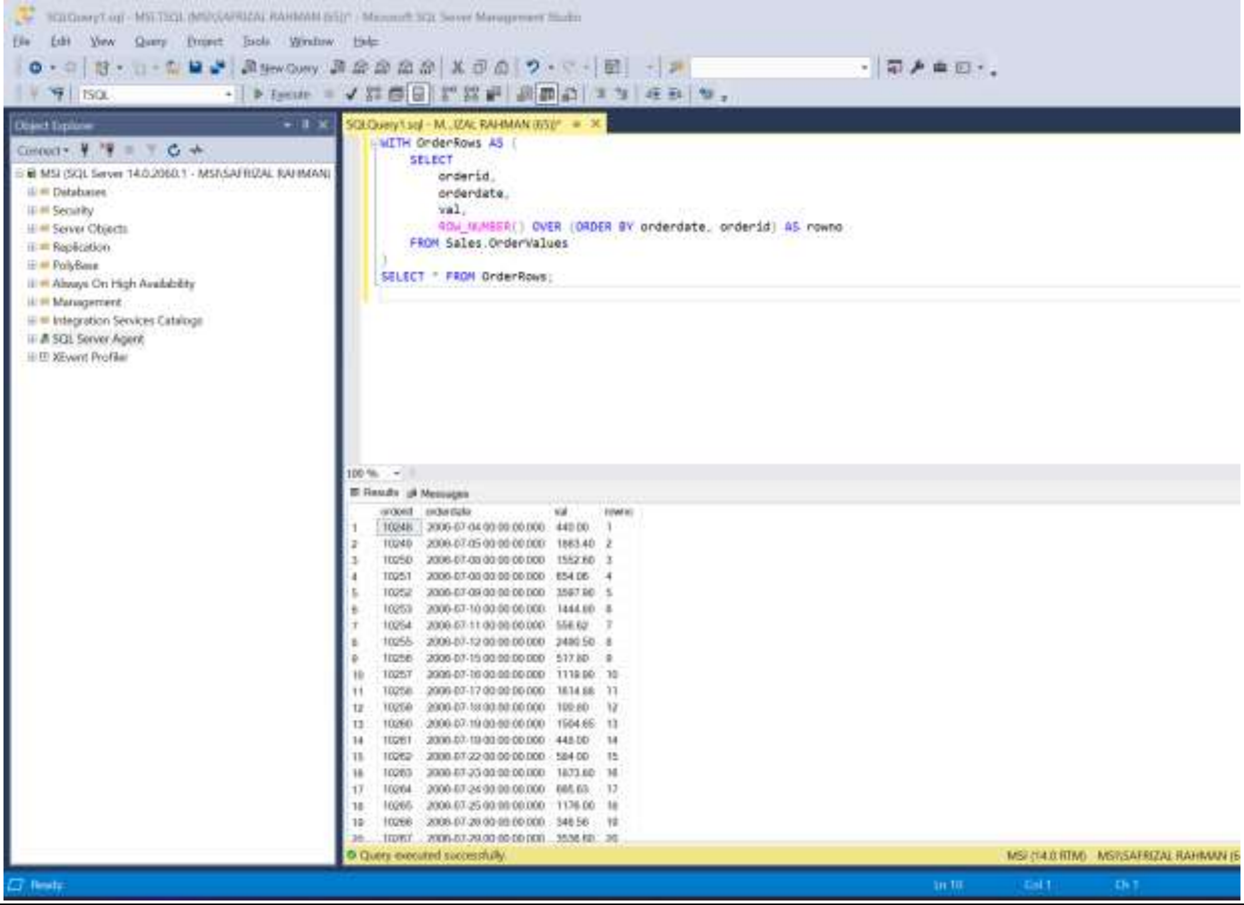
| | custid | orderyear | orderrankno | val |
|---|---|---|---|---|
| 1 | 1 | 2007 | 1 | 878.00 |
| 2 | 1 | 2007 | 2 | 814.50 |
| 3 | 1 | 2008 | 1 | 933.50 |
| 4 | 1 | 2008 | 2 | 845.80 |
| 5 | 2 | 2006 | 1 | 88.80 |
| 6 | 2 | 2007 | 1 | 479.75 |
| 7 | 2 | 2007 | 2 | 320.00 |
| 8 | 2 | 2008 | 1 | 514.40 |
| 9 | 3 | 2006 | 1 | 403.20 |
| 10 | 3 | 2007 | 1 | 2082.00 |
| 11 | 3 | 2007 | 2 | 1940.85 |

Query executed successfully. MENTARI-PC\MENTARI (11.0 SP2) MENTARI-PC\TOSHIBA (52) TSQL2012 00:00:00 418 rows

8

**Conclusion:** After carrying out this section of the practicum, students know how to use the ranking function in T-SQL statements.

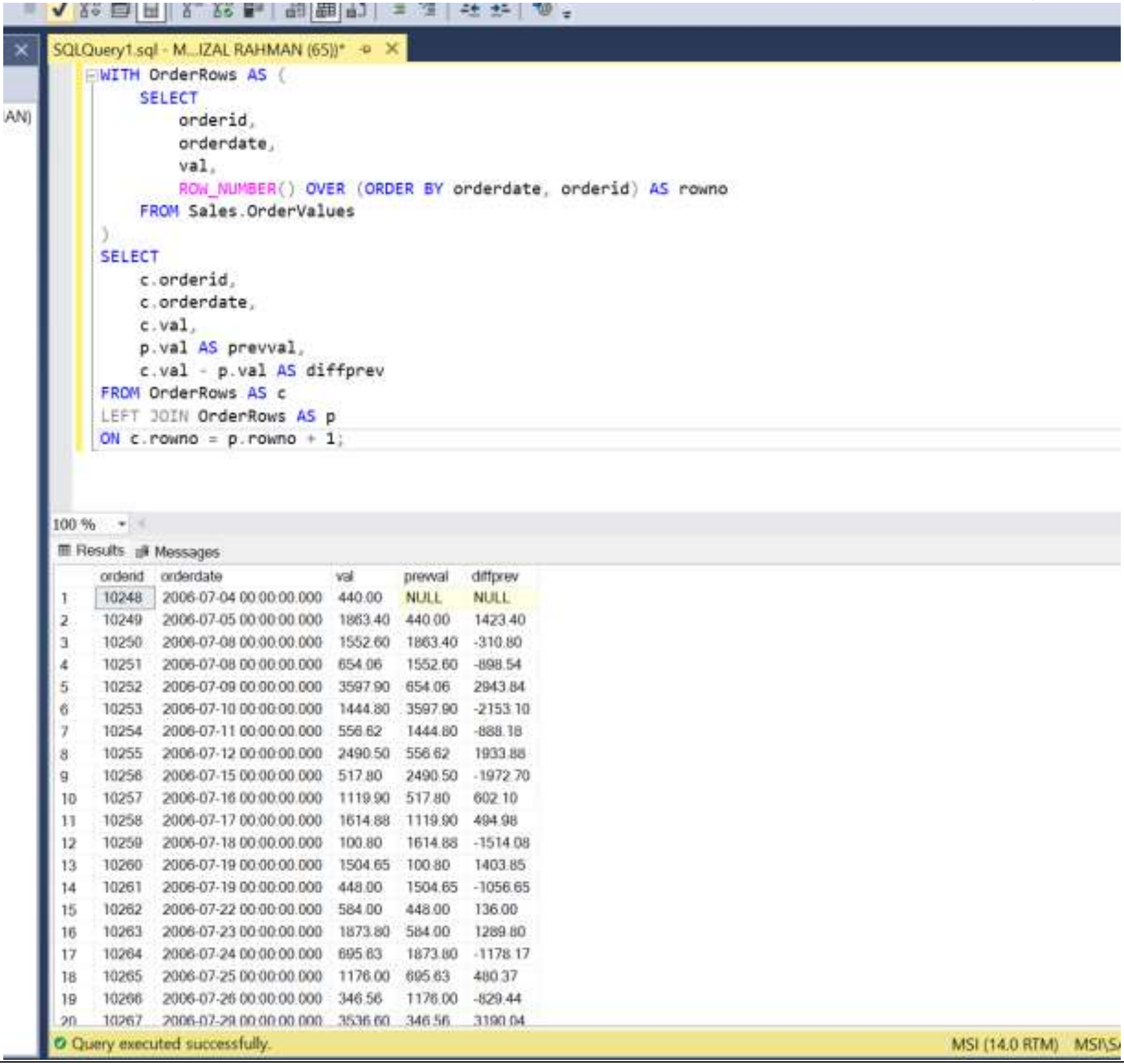
## Lab – Part 2: Writing Queries Using the OFFSET Function

| Step | Information |
|---|---|
| **1** | Scenario :<br>Another report is needed to analyze the difference between two consecutive rows. This will make it easier for *business users* to analyze growth and trends.<br>To carry out the experiment in this practical part 2, make sure the database is connected to “TSQL”. |
| **2** | [Question-7] Create a ( *common table expression* ) CTE named OrderRows based on a query that retrieves the orderid, orderdate, and val columns from the Sales.OrderValues view. Add a calculated result column named rowno using the ROW_NUMBER function sorted by the orderdate and orderid columns!<br> |

```sql
WITH OrderRows AS (
    SELECT
        orderid,
        orderdate,
        val,
        ROW_NUMBER() OVER (ORDER BY orderdate, orderid) AS rowno
    FROM Sales.OrderValues
)
SELECT * FROM OrderRows;
```

|  | 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 | 695.62 | 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 |

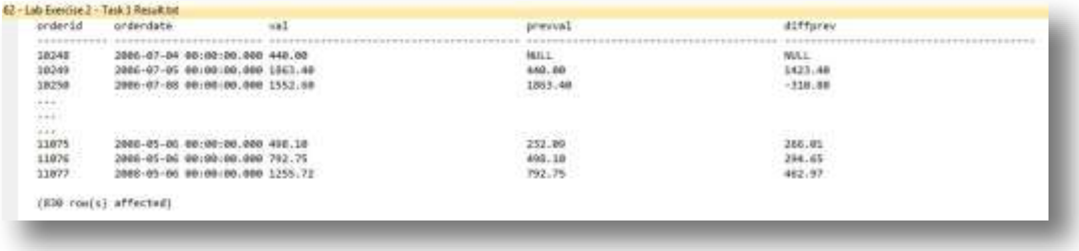
Query executed successfully.

| | |
|---|---|
| 3 | [Question-8] Write a SELECT statement against a CTE and use a LEFT JOIN with the same CTE to retrieve the current row *and* previous row *based* on the rowno column. Return the orderid, orderdate, and val columns for the current row and the val column for the previous row as prevval. Add a calculated column named diffprev that shows the difference between the current and previous val!  |

```sql
WITH OrderRows AS (
    SELECT
        orderid,
        orderdate,
        val,
        ROW_NUMBER() OVER (ORDER BY orderdate, orderid) AS rowno
    FROM Sales.OrderValues
)
SELECT
    c.orderid,
    c.orderdate,
    c.val,
    p.val AS prevval,
    c.val - p.val AS diffprev
FROM OrderRows AS c
LEFT JOIN OrderRows AS p
ON c.rowno = p.rowno + 1;
```

| | orderid | orderdate | val | prevval | diffprev |
|---|---|---|---|---|---|
| 1 | 10248 | 2006-07-04 00:00:00.000 | 440.00 | NULL | NULL |
| 2 | 10249 | 2006-07-05 00:00:00.000 | 1863.40 | 440.00 | 1423.40 |
| 3 | 10250 | 2006-07-08 00:00:00.000 | 1552.60 | 1863.40 | -310.80 |
| 4 | 10251 | 2006-07-08 00:00:00.000 | 654.06 | 1552.60 | -898.54 |
| 5 | 10252 | 2006-07-09 00:00:00.000 | 3597.90 | 654.06 | 2943.84 |
| 6 | 10253 | 2006-07-10 00:00:00.000 | 1444.80 | 3597.90 | -2153.10 |
| 7 | 10254 | 2006-07-11 00:00:00.000 | 556.62 | 1444.80 | -888.18 |
| 8 | 10255 | 2006-07-12 00:00:00.000 | 2490.50 | 556.62 | 1933.88 |
| 9 | 10256 | 2006-07-15 00:00:00.000 | 517.80 | 2490.50 | -1972.70 |
| 10 | 10257 | 2006-07-16 00:00:00.000 | 1119.90 | 517.80 | 602.10 |
| 11 | 10258 | 2006-07-17 00:00:00.000 | 1614.88 | 1119.90 | 494.98 |
| 12 | 10259 | 2006-07-18 00:00:00.000 | 100.80 | 1614.88 | -1514.08 |
| 13 | 10260 | 2006-07-19 00:00:00.000 | 1504.65 | 100.80 | 1403.85 |
| 14 | 10261 | 2006-07-19 00:00:00.000 | 448.00 | 1504.65 | -1056.65 |
| 15 | 10262 | 2006-07-22 00:00:00.000 | 584.00 | 448.00 | 136.00 |
| 16 | 10263 | 2006-07-23 00:00:00.000 | 1873.80 | 584.00 | 1289.80 |
| 17 | 10264 | 2006-07-24 00:00:00.000 | 695.63 | 1873.80 | -1178.17 |
| 18 | 10265 | 2006-07-25 00:00:00.000 | 1176.00 | 695.63 | 480.37 |
| 19 | 10266 | 2006-07-26 00:00:00.000 | 346.56 | 1176.00 | -829.44 |
| 20 | 10267 | 2006-07-29 00:00:00.000 | 3536.60 | 346.56 | 3190.04 |

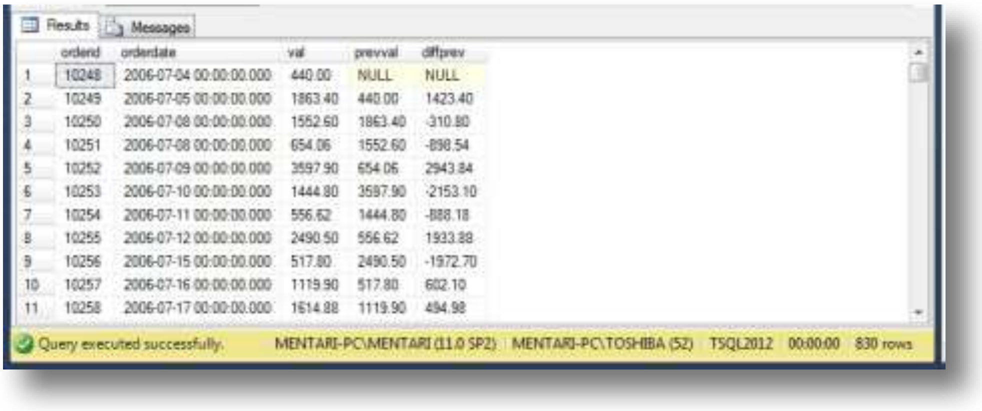
Query executed successfully.



62 - Lab Exercise 2 - Task 3 Result.txt

```
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
...
...
...
11075       2008-05-06 00:00:00.000 498.10                                  232.09                                  266.01
11076       2008-05-06 00:00:00.000 792.75                                  498.10                                  294.65
11077       2008-05-06 00:00:00.000 1255.72                                 792.75                                  462.97

(830 row(s) affected)
```

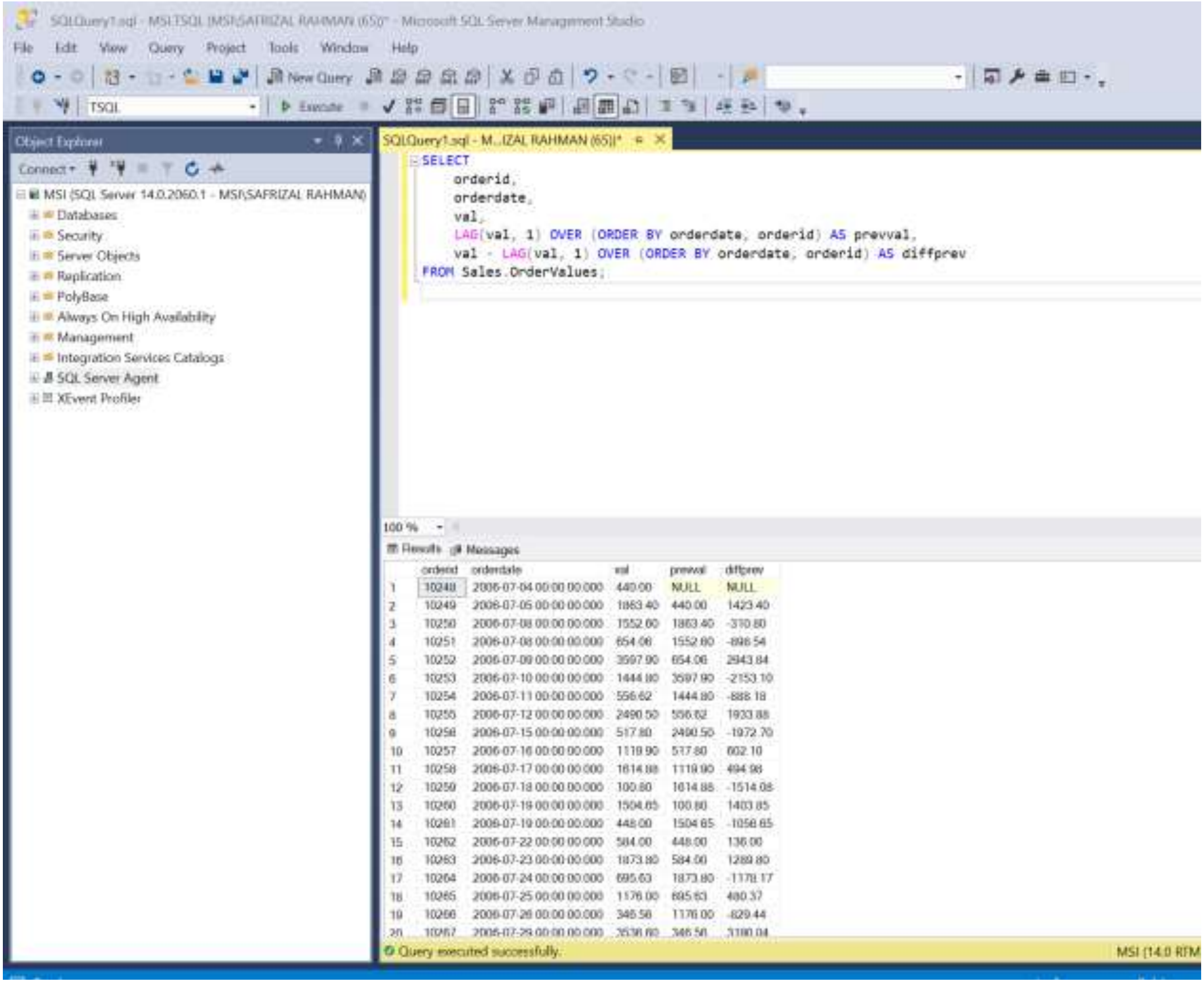


|  | orderid | orderdate | val | prevval | diffprev |
|---|---|---|---|---|---|
| 1 | 10248 | 2006-07-04 00:00:00.000 | 440.00 | NULL | NULL |
| 2 | 10249 | 2006-07-05 00:00:00.000 | 1863.40 | 440.00 | 1423.40 |
| 3 | 10250 | 2006-07-08 00:00:00.000 | 1552.60 | 1863.40 | -310.80 |
| 4 | 10251 | 2006-07-08 00:00:00.000 | 654.06 | 1552.60 | -898.54 |
| 5 | 10252 | 2006-07-09 00:00:00.000 | 3597.90 | 654.06 | 2943.84 |
| 6 | 10253 | 2006-07-10 00:00:00.000 | 1444.80 | 3597.90 | -2153.10 |
| 7 | 10254 | 2006-07-11 00:00:00.000 | 556.62 | 1444.80 | -888.18 |
| 8 | 10255 | 2006-07-12 00:00:00.000 | 2490.50 | 556.62 | 1933.88 |
| 9 | 10256 | 2006-07-15 00:00:00.000 | 517.80 | 2490.50 | -1972.70 |
| 10 | 10257 | 2006-07-16 00:00:00.000 | 1119.90 | 517.80 | 602.10 |
| 11 | 10258 | 2006-07-17 00:00:00.000 | 1614.88 | 1119.90 | 494.98 |

Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 830 rows

**4**

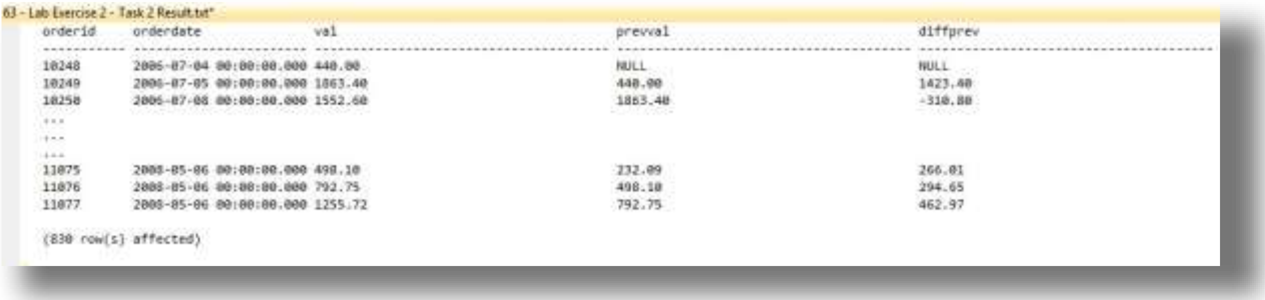
[Question-9] Write a SELECT statement using the LAG function to get the same results as the query in question no.2! The query created in this problem does not use CTE.


SQLQuery1.sql - MSI.TSQL (MSI\SAFRIZAL RAHMAN (65))* - Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Help
New Query
TSQL
Execute
Object Explorer
Connect
MSI (SQL Server 14.0.2060.1 - MSI\SAFRIZAL RAHMAN)
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent
XEvent Profiler
SQLQuery1.sql - M...IZAL RAHMAN (65))*
100 %
Results
Messages
MSI (14.0 RTM

```sql
SELECT
    orderid,
    orderdate,
    val,
    LAG(val, 1) OVER (ORDER BY orderdate, orderid) AS prevval,
    val - LAG(val, 1) OVER (ORDER BY orderdate, orderid) AS diffprev
FROM Sales.OrderValues;
```

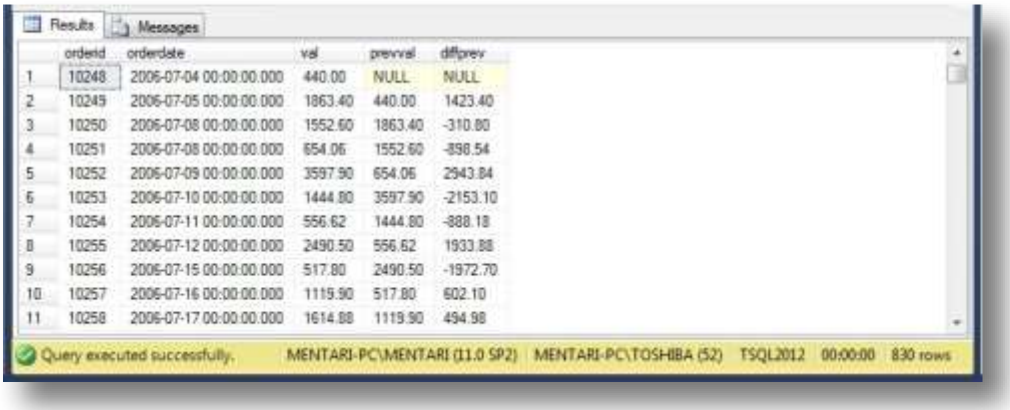
|  | orderid | orderdate | val | prevval | diffprev |
|---|---|---|---|---|---|
| 1 | 10248 | 2006-07-04 00:00:00.000 | 440.00 | NULL | NULL |
| 2 | 10249 | 2006-07-05 00:00:00.000 | 1863.40 | 440.00 | 1423.40 |
| 3 | 10250 | 2006-07-08 00:00:00.000 | 1552.60 | 1863.40 | -310.80 |
| 4 | 10251 | 2006-07-08 00:00:00.000 | 654.06 | 1552.60 | -898.54 |
| 5 | 10252 | 2006-07-09 00:00:00.000 | 3597.90 | 654.06 | 2943.84 |
| 6 | 10253 | 2006-07-10 00:00:00.000 | 1444.80 | 3597.90 | -2153.10 |
| 7 | 10254 | 2006-07-11 00:00:00.000 | 556.62 | 1444.80 | -888.18 |
| 8 | 10255 | 2006-07-12 00:00:00.000 | 2490.50 | 556.62 | 1933.88 |
| 9 | 10256 | 2006-07-15 00:00:00.000 | 517.80 | 2490.50 | -1972.70 |
| 10 | 10257 | 2006-07-16 00:00:00.000 | 1119.90 | 517.80 | 602.10 |
| 11 | 10258 | 2006-07-17 00:00:00.000 | 1614.88 | 1119.90 | 494.98 |
| 12 | 10259 | 2006-07-18 00:00:00.000 | 100.80 | 1614.88 | -1514.08 |
| 13 | 10260 | 2006-07-19 00:00:00.000 | 1504.65 | 100.80 | 1403.85 |
| 14 | 10261 | 2006-07-19 00:00:00.000 | 448.00 | 1504.65 | -1056.65 |
| 15 | 10262 | 2006-07-22 00:00:00.000 | 584.00 | 448.00 | 136.00 |
| 16 | 10263 | 2006-07-23 00:00:00.000 | 1873.80 | 584.00 | 1289.80 |
| 17 | 10264 | 2006-07-24 00:00:00.000 | 695.63 | 1873.80 | -1178.17 |
| 18 | 10265 | 2006-07-25 00:00:00.000 | 1176.00 | 695.63 | 480.37 |
| 19 | 10266 | 2006-07-26 00:00:00.000 | 346.56 | 1176.00 | -829.44 |
| 20 | 10267 | 2006-07-29 00:00:00.000 | 3536.60 | 346.56 | 3190.04 |

Query executed successfully.



```
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
...
...
...
11075       2008-05-06 00:00:00.000 498.10                                    232.09                                    266.01
11076       2008-05-06 00:00:00.000 792.75                                    498.10                                    294.65
11077       2008-05-06 00:00:00.000 1255.72                                   792.75                                    462.97

(830 row(s) affected)
```

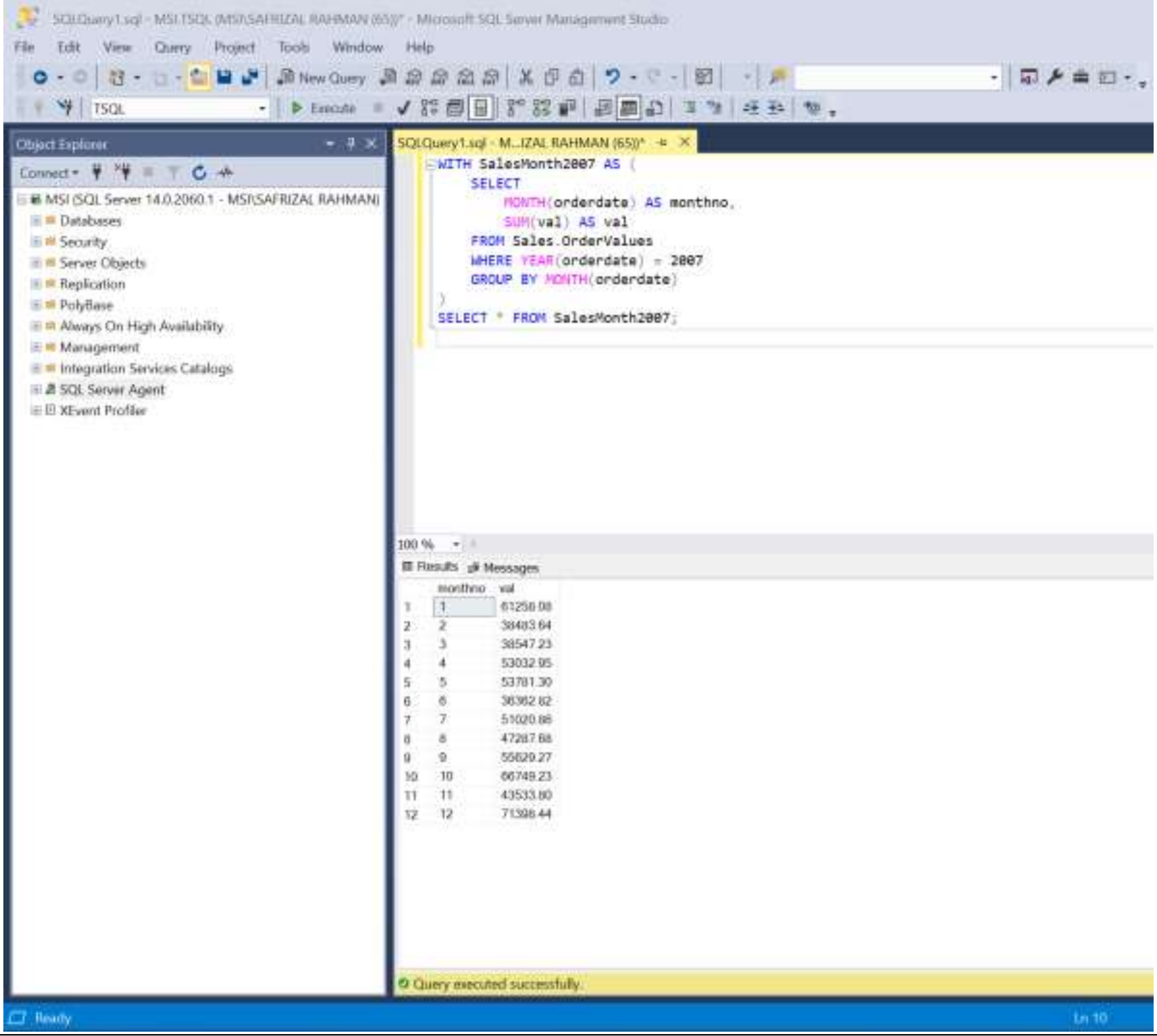


|  | orderid | orderdate | val | prevval | diffprev |
|---|---|---|---|---|---|
| 1 | 10248 | 2006-07-04 00:00:00.000 | 440.00 | NULL | NULL |
| 2 | 10249 | 2006-07-05 00:00:00.000 | 1863.40 | 440.00 | 1423.40 |
| 3 | 10250 | 2006-07-08 00:00:00.000 | 1552.60 | 1863.40 | -310.80 |
| 4 | 10251 | 2006-07-08 00:00:00.000 | 654.06 | 1552.60 | -898.54 |
| 5 | 10252 | 2006-07-09 00:00:00.000 | 3597.90 | 654.06 | 2943.84 |
| 6 | 10253 | 2006-07-10 00:00:00.000 | 1444.80 | 3597.90 | -2153.10 |
| 7 | 10254 | 2006-07-11 00:00:00.000 | 556.62 | 1444.80 | -888.18 |
| 8 | 10255 | 2006-07-12 00:00:00.000 | 2490.50 | 556.62 | 1933.88 |
| 9 | 10256 | 2006-07-15 00:00:00.000 | 517.80 | 2490.50 | -1972.70 |
| 10 | 10257 | 2006-07-16 00:00:00.000 | 1119.90 | 517.80 | 602.10 |
| 11 | 10258 | 2006-07-17 00:00:00.000 | 1614.88 | 1119.90 | 494.98 |

Query executed successfully. MENTARI-PC\MENTARI (11.0 SP2) MENTARI-PC\TOSHIBA (52) TSQL2012 00:00:00 830 rows

**5**

[Question-10] Create a CTE named SalesMonth2007 that creates two columns, namely, monthno (the number of months from the orderdate column) and val (the aggregate of the val column)! Then filter the results only for the order year 2007 and group by monthno!


SQLQuery1.sql - MSI.TSQL (MSI\SAFRIZAL RAHMAN (65))* - Microsoft SQL Server Management Studio
File
Edit
View
Query
Project
Tools
Window
Help
New Query
TSQL
Execute
Object Explorer
Connect
MSI (SQL Server 14.0.2060.1 - MSI\SAFRIZAL RAHMAN)
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent
XEvent Profiler
SQLQuery1.sql - M...IZAL RAHMAN (65))*
100 %
Results
Messages
Ready
Ln 10

```sql
WITH SalesMonth2007 AS (
    SELECT
        MONTH(orderdate) AS monthno,
        SUM(val) AS val
    FROM Sales.OrderValues
    WHERE YEAR(orderdate) = 2007
    GROUP BY MONTH(orderdate)
)
SELECT * FROM SalesMonth2007;
```

```
    monthno  val
1   1        61258.08
2   2        38483.64
3   3        38547.23
4   4        53032.95
5   5        53781.30
6   6        36362.82
7   7        51020.86
8   8        47287.68
9   9        55629.27
10  10       66749.23
11  11       43533.80
12  12       71398.44
```

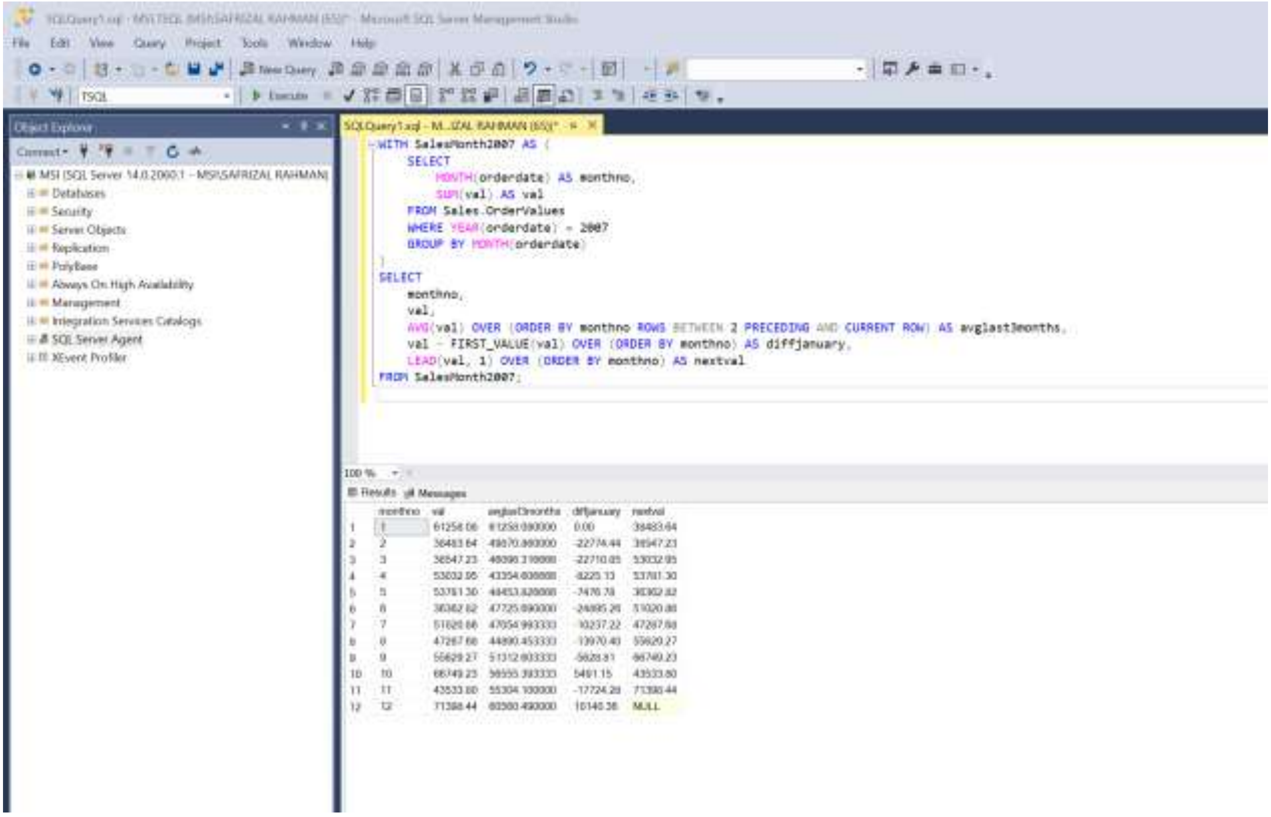
Query executed successfully.

**6**

[Question-11] Write a SELECT statement that will take the monthno and val columns from the CTE and add 3 columns to display, namely:

1) avglast3months (average sales amount of three months) final)
2) diffjanuary (difference between current val and val in january, use FIRST_VALUE function)
3) nextval (value of val column in month furthermore)

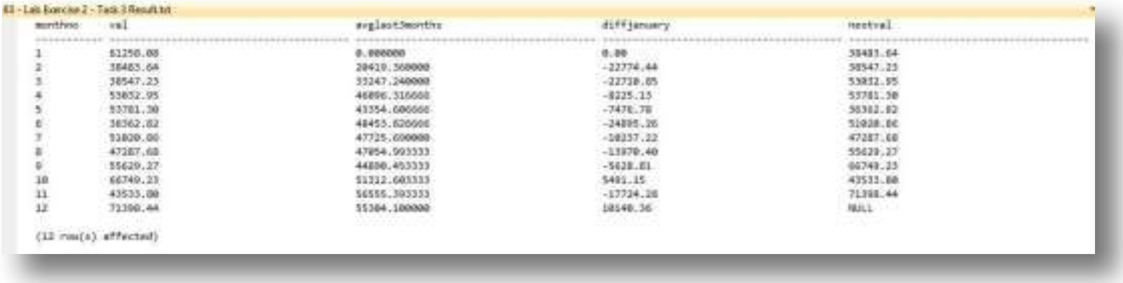
Information: The average amount for the last three months is not calculated correctly because



SQLQuery1.sql - M...IZAL RAHMAN (65)*

```
WITH SalesMonth2007 AS (
    SELECT
        MONTH(orderdate) AS monthno,
        SUM(val) AS val
    FROM Sales.OrderValues
    WHERE YEAR(orderdate) = 2007
    GROUP BY MONTH(orderdate)
)
SELECT
    monthno,
    val,
    AVG(val) OVER (ORDER BY monthno ROWS BETWEEN 2 PRECEDING AND CURRENT ROW) AS avglast3months,
    val - FIRST_VALUE(val) OVER (ORDER BY monthno) AS diffjanuary,
    LEAD(val, 1) OVER (ORDER BY monthno) AS nextval
FROM SalesMonth2007;
```

|  | monthno | val | avglast3months | diffjanuary | nextval |
|---|---|---|---|---|---|
| 1 | 1 | 61258.08 | 61258.080000 | 0.00 | 38483.64 |
| 2 | 2 | 38483.64 | 49870.860000 | -22774.44 | 38547.23 |
| 3 | 3 | 38547.23 | 46096.316666 | -22710.85 | 53032.95 |
| 4 | 4 | 53032.95 | 43354.606666 | -8225.13 | 53781.30 |
| 5 | 5 | 53781.30 | 48453.826666 | -7476.78 | 36362.82 |
| 6 | 6 | 36362.82 | 47725.690000 | -24895.26 | 51020.86 |
| 7 | 7 | 51020.86 | 47054.993333 | -10237.22 | 47287.68 |
| 8 | 8 | 47287.68 | 44890.453333 | -13970.40 | 55629.27 |
| 9 | 9 | 55629.27 | 51312.603333 | -5628.81 | 66749.23 |
| 10 | 10 | 66749.23 | 56555.393333 | 5491.15 | 43533.80 |
| 11 | 11 | 43533.80 | 55304.100000 | -17724.28 | 71398.44 |
| 12 | 12 | 71398.44 | 60560.490000 | 10140.36 | NULL |

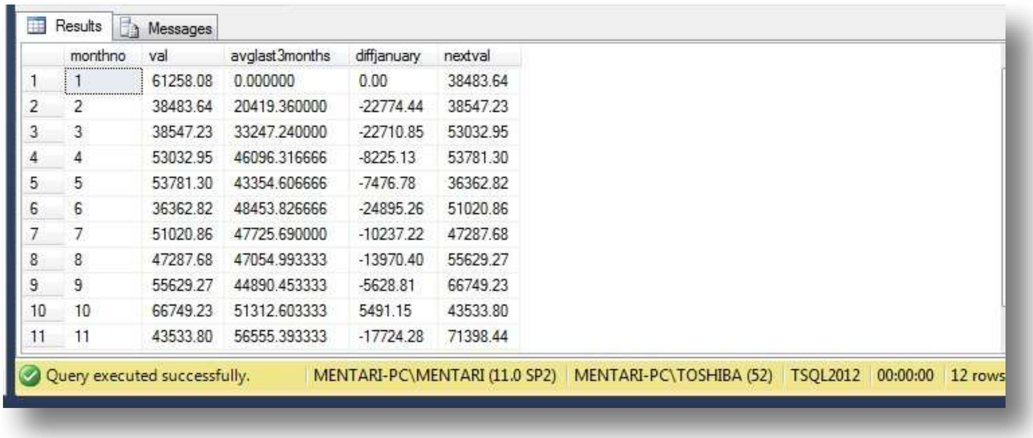


83 - Lab Exercise 2 - Task 3 Result.txt

```
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            -22710.85               53032.95
4          53032.95                46096.316666            -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

(12 row(s) affected)
```

the total amount of the first 2 months is divided by 3.

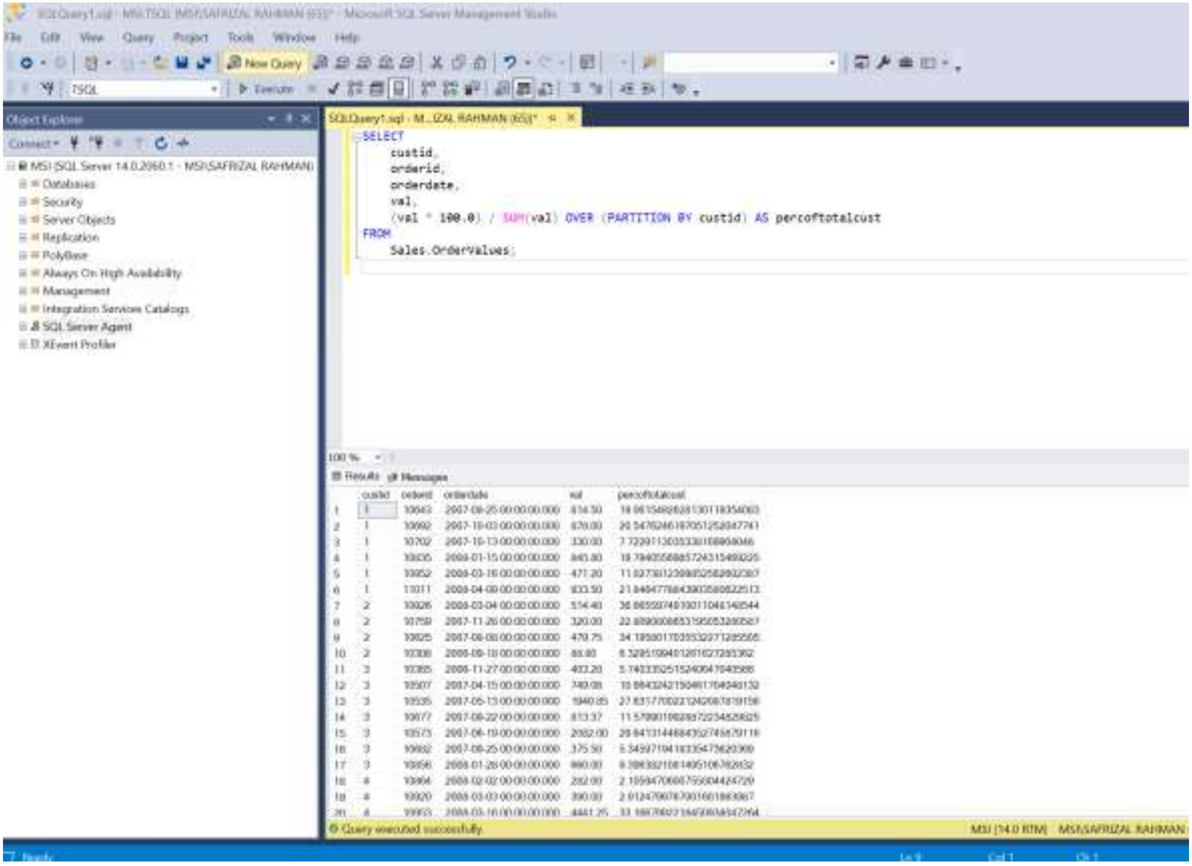
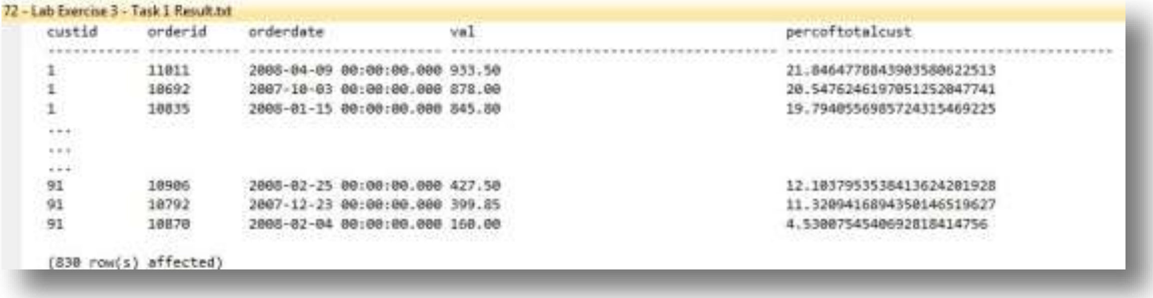


|  | monthno | val | avglast3months | diffjanuary | nextval |
|---|---|---|---|---|---|
| 1 | 1 | 61258.08 | 0.000000 | 0.00 | 38483.64 |
| 2 | 2 | 38483.64 | 20419.360000 | -22774.44 | 38547.23 |
| 3 | 3 | 38547.23 | 33247.240000 | -22710.85 | 53032.95 |
| 4 | 4 | 53032.95 | 46096.316666 | -8225.13 | 53781.30 |
| 5 | 5 | 53781.30 | 43354.606666 | -7476.78 | 36362.82 |
| 6 | 6 | 36362.82 | 48453.826666 | -24895.26 | 51020.86 |
| 7 | 7 | 51020.86 | 47725.690000 | -10237.22 | 47287.68 |
| 8 | 8 | 47287.68 | 47054.993333 | -13970.40 | 55629.27 |
| 9 | 9 | 55629.27 | 44890.453333 | -5628.81 | 66749.23 |
| 10 | 10 | 66749.23 | 51312.603333 | 5491.15 | 43533.80 |
| 11 | 11 | 43533.80 | 56555.393333 | -17724.28 | 71398.44 |

Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 12 rows

7 **Conclusion** : After carrying out this section of the practicum, students can use the OFFSET function in T-SQL statements.

## Lab – Part 3: Writing Queries Using Window Aggregation Functions

| Step | Information |
|---|---|
| 1 | Scenario :<br>To better understand the cumulative sales value of customers over time and to provide sales analysts with year-long analysis a different SELECT statement using the window aggregate function is required.<br><br>To carry out the experiment in this practical part 3, make sure the database is connected to "TSQL". |
| 2 | [Question-12] Write a SELECT statement to retrieve the custid, orderid, orderdate, and val columns from the Sales.OrderValues view. Add a column named percoftotalcust that contains the percentage of each sales order amount compared to the total sales for that customer!<br><br>`SELECT custid, orderid, orderdate, val, (val * 100.0) / SUM(val) OVER (PARTITION BY custid) AS percoftotalcust FROM Sales.OrderValues;`<br><br>72 - Lab Exercise 3 - Task 1 Result.txt |

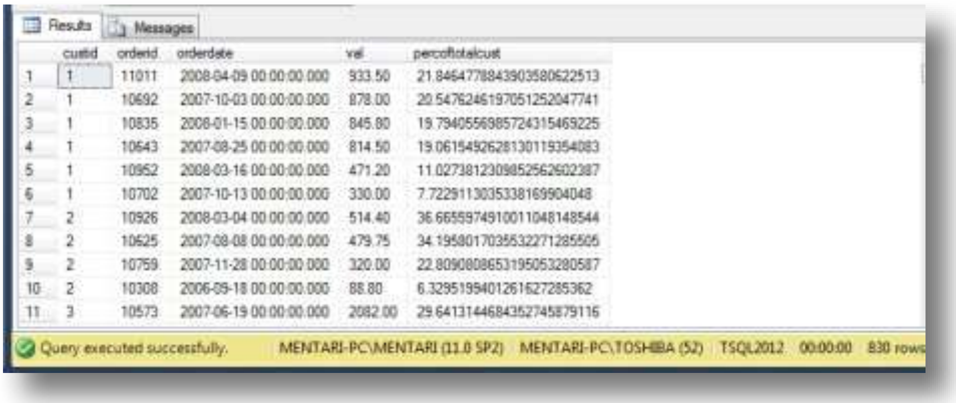
```sql
SELECT
    custid,
    orderid,
    orderdate,
    val,
    (val * 100.0) / SUM(val) OVER (PARTITION BY custid) AS percoftotalcust
FROM
    Sales.OrderValues;
```

```
    custid  orderid  orderdate                val      percoftotalcust
1   1       10643    2007-08-25 00:00:00.000  814.50   19.0615492628130119354060
2   1       10692    2007-10-03 00:00:00.000  878.00   20.5476246197051252047741
3   1       10702    2007-10-13 00:00:00.000  330.00   7.7229113035338169904046
4   1       10835    2008-01-15 00:00:00.000  845.80   19.7940556985724315469225
5   1       10952    2008-03-16 00:00:00.000  471.20   11.0273812309852562602807
6   1       11011    2008-04-09 00:00:00.000  933.50   21.8464778843903580622513
7   2       10926    2008-03-04 00:00:00.000  514.40   36.6655974910011048140544
8   2       10759    2007-11-28 00:00:00.000  320.00   22.8090808653195053280527
9   2       10625    2007-08-08 00:00:00.000  479.75   34.1958017035532271285508
10  2       10308    2006-09-18 00:00:00.000  88.80    6.3295199401261627285362
11  3       10365    2006-11-27 00:00:00.000  403.20   5.7403352515240647040566
12  3       10507    2007-04-15 00:00:00.000  749.06   10.6643242150461704840132
13  3       10535    2007-05-13 00:00:00.000  1940.85  27.6317700221242087859156
14  3       10677    2007-09-22 00:00:00.000  813.37   11.5799010082887223482625
15  3       10573    2007-06-19 00:00:00.000  2082.00  29.6413144684352746879116
16  3       10682    2007-09-25 00:00:00.000  375.50   5.3459719418335477620300
17  3       10856    2008-01-28 00:00:00.000  660.00   9.3963822108140510678283
18  4       10864    2008-02-02 00:00:00.000  282.00   2.1059470600755004424729
19  4       10920    2008-03-03 00:00:00.000  390.00   2.9124796787001601863067
20  4       10953    2008-03-16 00:00:00.000  4441.25  33.1667842219470804347264
Query executed successfully.                                  MSI (14.0 RTM)  MSI\SAFRIZAL RAHMAN
```

SQLQuery1.sql - MSI.TSQL (MSI\SAFRIZAL RAHMAN (65))* - Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Help
New Query
TSQL
Execute
Object Explorer
Connect
MSI (SQL Server 14.0.2060.1 - MSI\SAFRIZAL RAHMAN)
Databases
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent
XEvent Profiler
SQLQuery1.sql - M...IZAL RAHMAN (65))*
100 %
Results
Messages
Ready

```
custid      orderid     orderdate               val                                   percoftotalcust
----------- ----------- ----------------------- ------------------------------------- ---------------------------------------
1           11011       2008-04-09 00:00:00.000 933.50                                21.8464778843903580622513
1           10692       2007-10-03 00:00:00.000 878.00                                20.5476246197051252047741
1           10835       2008-01-15 00:00:00.000 845.80                                19.7940556985724315469225
...
...
...
91          10906       2008-02-25 00:00:00.000 427.50                                12.1037953538413624201928
91          10792       2007-12-23 00:00:00.000 399.85                                11.3209416894350146519627
91          10870       2008-02-04 00:00:00.000 160.00                                4.5300754540692818414756

(830 row(s) affected)
```

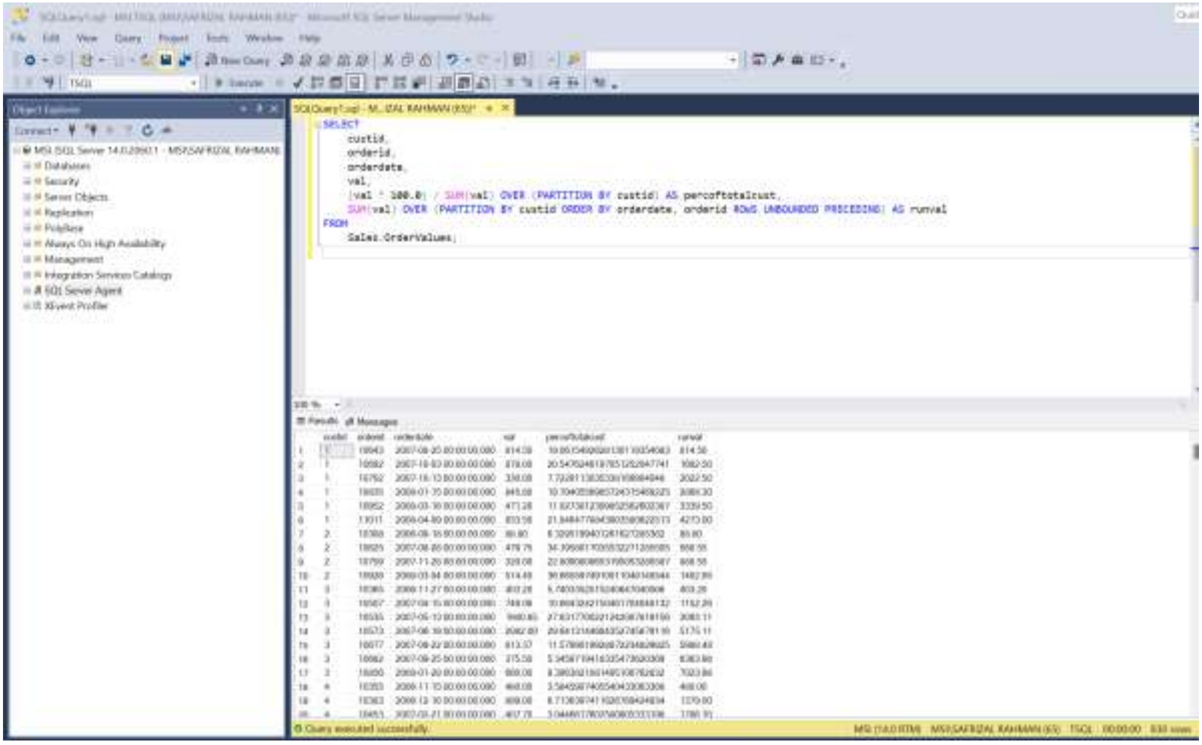


| | custid | orderid | orderdate | val | percoftotalcust |
|---|---|---|---|---|---|
| 1 | 1 | 11011 | 2008-04-09 00:00:00.000 | 933.50 | 21.8464778843903580622513 |
| 2 | 1 | 10692 | 2007-10-03 00:00:00.000 | 878.00 | 20.5476246197051252047741 |
| 3 | 1 | 10835 | 2008-01-15 00:00:00.000 | 845.80 | 19.7940556985724315469225 |
| 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 | 7.7229113035338169904048 |
| 7 | 2 | 10926 | 2008-03-04 00:00:00.000 | 514.40 | 36.6659749100110481485444 |
| 8 | 2 | 10625 | 2007-08-08 00:00:00.000 | 479.75 | 34.1958017035532271285505 |
| 9 | 2 | 10759 | 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 |

Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 830 rows

3

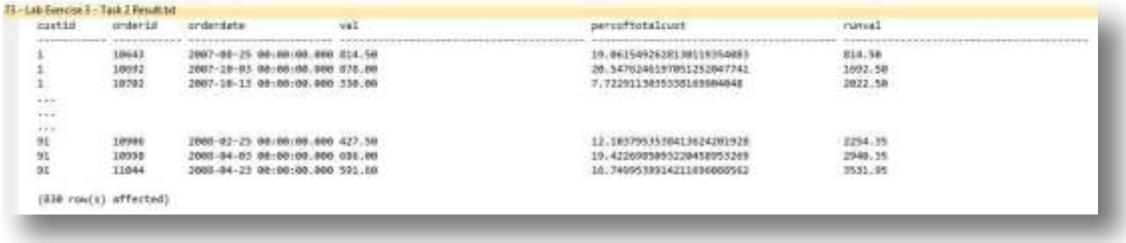
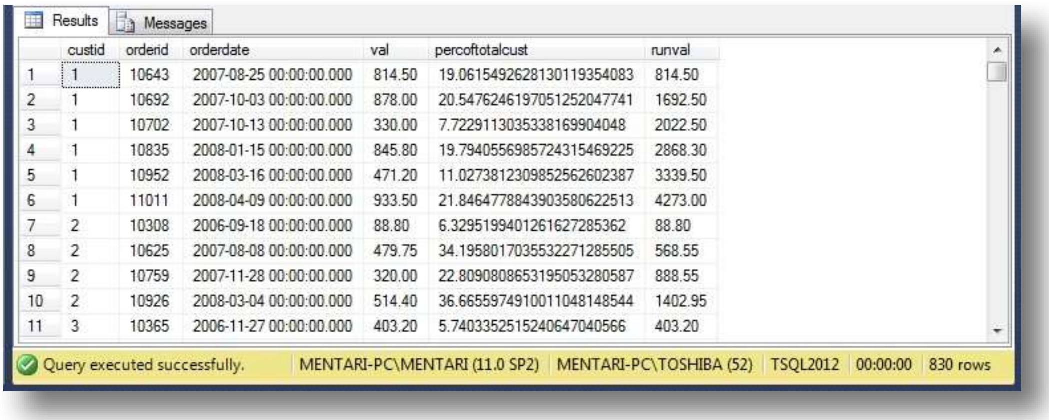
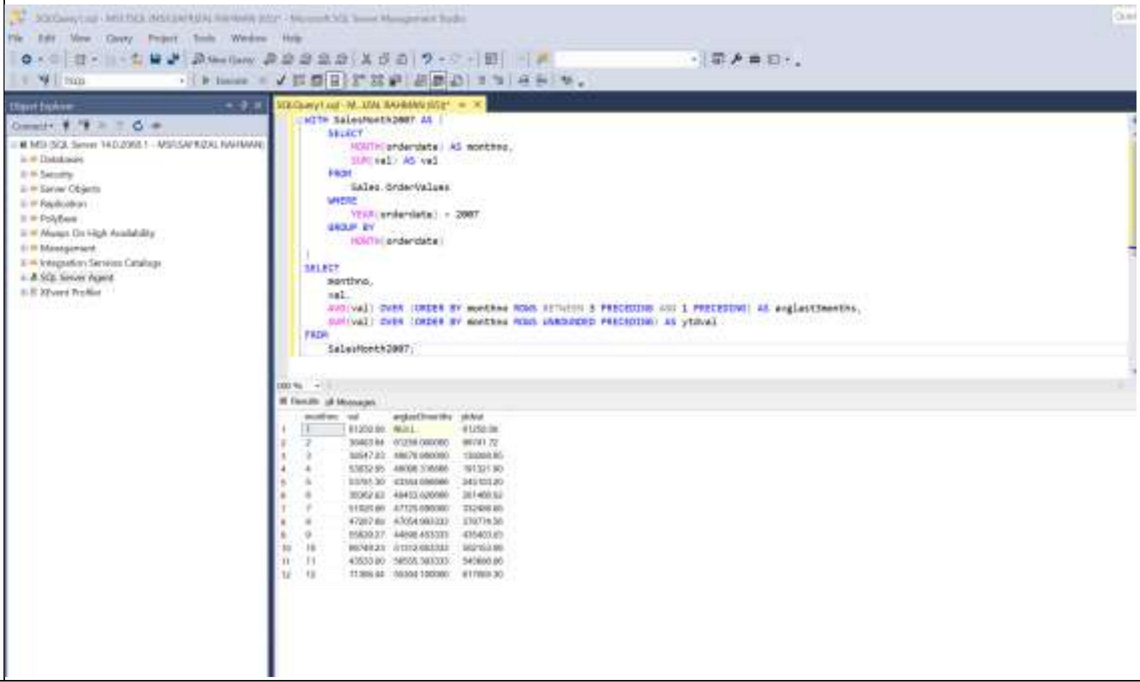
[Question-13] Copy the previous SELECT statement and modify it by adding a new calculated column named runval! This column should contain the total sales that have occurred for each customer based on the order date, using orderid as the tiebreaker.

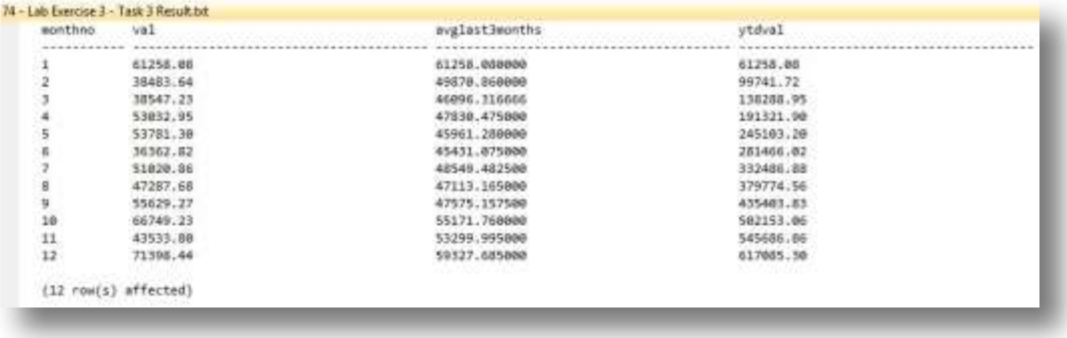


```
SELECT
    custid,
    orderid,
    orderdate,
    val,
    (val * 100.0) / SUM(val) OVER (PARTITION BY custid) AS percoftotalcust,
    SUM(val) OVER (PARTITION BY custid ORDER BY orderdate, orderid ROWS UNBOUNDED PRECEDING) AS runval
FROM
    Sales.OrderValues;
```

| | 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 | 36.6659749100110481485444 | 1402.95 |
| 11 | 3 | 10365 | 2006-11-27 00:00:00.000 | 403.20 | [illegible] | 403.20 |
| 12 | 3 | 10507 | 2007-04-15 00:00:00.000 | 749.06 | [illegible] | 1152.26 |
| 13 | 3 | 10535 | 2007-05-13 00:00:00.000 | 1940.85 | [illegible] | 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 | [illegible] | 5988.48 |
| 16 | 3 | 10682 | 2007-09-25 00:00:00.000 | 375.50 | [illegible] | 6363.98 |
| 17 | 3 | 10856 | 2008-01-28 00:00:00.000 | 660.00 | [illegible] | 7023.98 |
| 18 | 4 | 10355 | 2006-11-15 00:00:00.000 | 480.00 | [illegible] | 480.00 |
| 19 | 4 | 10383 | 2006-12-16 00:00:00.000 | 899.00 | [illegible] | 1379.00 |
| 20 | 4 | 10453 | 2007-02-21 00:00:00.000 | 407.70 | [illegible] | 1786.70 |

Query executed successfully. | MSI (14.0 RTM) | MSI\SAFRIZAL RAHMAN (65) | TSQL | 00:00:00 | 830 rows

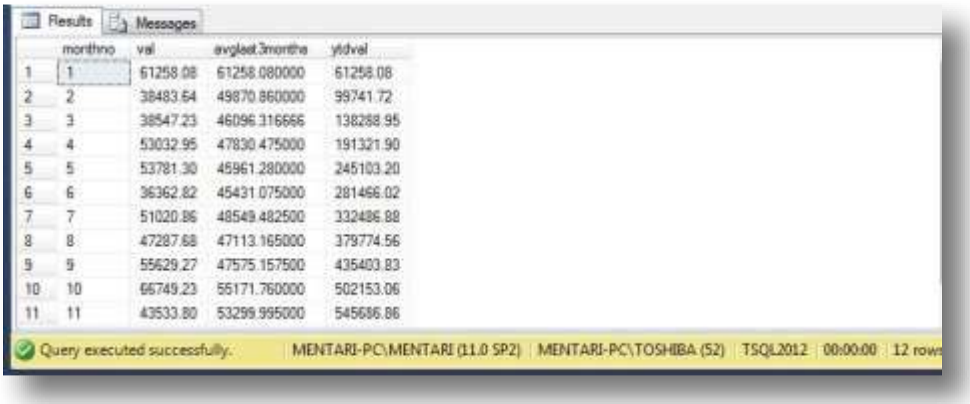
| | |
|---|---|
| |  73 - Lab Exercise 3 - Task 2 Result.txt<br>`custid  orderid  orderdate                val     percoftotalcust              runval`<br>`1       10643    2007-08-25 00:00:00.000  814.50  19.0615492628130119354083    814.50`<br>`1       10692    2007-10-03 00:00:00.000  878.00  20.5476246197051252047741    1692.50`<br>`1       10702    2007-10-13 00:00:00.000  330.00  7.7229113035338169904048     2022.50`<br>`...`<br>`...`<br>`...`<br>`91      10986    2008-02-25 00:00:00.000  427.50  12.1037953538413624201928    2254.35`<br>`91      10998    2008-04-03 00:00:00.000  686.00  19.4226985895220458953269    2940.35`<br>`91      11044    2008-04-23 00:00:00.000  591.60  16.7495339142110368088562    3531.95`<br>`(830 row(s) affected)`<br> Results / Messages<br>`    custid orderid orderdate               val    percoftotalcust           runval`<br>`1   1      10643   2007-08-25 00:00:00.000 814.50 19.0615492628130119354083 814.50`<br>`2   1      10692   2007-10-03 00:00:00.000 878.00 20.5476246197051252047741 1692.50`<br>`3   1      10702   2007-10-13 00:00:00.000 330.00 7.7229113035338169904048  2022.50`<br>`4   1      10835   2008-01-15 00:00:00.000 845.80 19.7940556985724315469225 2868.30`<br>`5   1      10952   2008-03-16 00:00:00.000 471.20 11.0273812309852562602387 3339.50`<br>`6   1      11011   2008-04-09 00:00:00.000 933.50 21.8464778843903580622513 4273.00`<br>`7   2      10308   2006-09-18 00:00:00.000 88.80  6.3295199401261627285362  88.80`<br>`8   2      10625   2007-08-08 00:00:00.000 479.75 34.1958017035532271285505 568.55`<br>`9   2      10759   2007-11-28 00:00:00.000 320.00 22.8090808653195053280587 888.55`<br>`10  2      10926   2008-03-04 00:00:00.000 514.40 36.6655974910011048148544 1402.95`<br>`11  3      10365   2006-11-27 00:00:00.000 403.20 5.7403352515240647040566  403.20`<br>Query executed successfully. \| MENTARI-PC\MENTARI (11.0 SP2) \| MENTARI-PC\TOSHIBA (52) \| TSQL2012 \| 00:00:00 \| 830 rows |
| **4** | [Question-14] Copy the SalesMonth2007 CTE in experiment 2. Write a SELECT statement to retrieve the monthno and val columns. Add two computed columns:<br>1) avglast3months. This column should contain the average sales amount for the last three months before the current month using the aggregate window function. Assume that there are no *missing months* .<br>2) ytdval This column must contain the cumulative sales value up to the current month. This.<br><br>`WITH SalesMonth2007 AS (`<br>`    SELECT`<br>`        MONTH(orderdate) AS monthno,`<br>`        SUM(val) AS val`<br>`    FROM`<br>`        Sales.OrderValues`<br>`    WHERE`<br>`        YEAR(orderdate) = 2007`<br>`    GROUP BY`<br>`        MONTH(orderdate)`<br>`)`<br>`SELECT`<br>`    monthno,`<br>`    val,`<br>`    AVG(val) OVER (ORDER BY monthno ROWS BETWEEN 3 PRECEDING AND 1 PRECEDING) AS avglast3months,`<br>`    SUM(val) OVER (ORDER BY monthno ROWS UNBOUNDED PRECEDING) AS ytdval`<br>`FROM`<br>`    SalesMonth2007;`<br>Results / Messages<br>`    monthno val      avglast3months ytdval`<br>`1   1       61258.08 NULL           61258.08`<br>`2   2       38483.64 61258.080000   99741.72`<br>`3   3       38547.23 49870.860000   138288.95`<br>`4   4       53032.95 46096.316666   191321.90`<br>`5   5       53781.30 43354.606666   245103.20`<br>`6   6       36362.82 48453.826666   281466.02`<br>`7   7       51020.86 47725.690000   332486.88`<br>`8   8       47287.68 47054.993333   379774.56`<br>`9   9       55629.27 44890.453333   435403.83`<br>`10  10      66749.23 51312.603333   502153.06`<br>`11  11      43533.80 56555.393333   545686.86`<br>`12  12      71398.44 55304.100000   617085.30` |



74 - Lab Exercise 3 - Task 3 Result.txt

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

(12 row(s) affected)
```



|  | 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 |

Query executed successfully. | MENTARI-PC\MENTARI (11.0 SP2) | MENTARI-PC\TOSHIBA (52) | TSQL2012 | 00:00:00 | 12 rows

|  |  |
|---|---|
| **5** | **Conclusion** : After doing this practical section, you will gain a basic understanding of how to use the window aggregation function in T-SQL statements. |

***--- Have a great time doing it ----***