Anton Slizh's

U2M6.LW.Analytic Functions

GitHub: https://github.com/drapejny/DataCamp2022

Note: When I was doing this lab someone allocated too much memory and I couldn't load my data to DW layer.

```
ORA-27072: Ошибка ввода/вывода файла
Linux-x86_64 Error: 28: No space left on device
Additional information: 4
Additional information: 5060
Additional information: 4294967295
ORA-01114: ошибка ввода/вывода при записи блока в файл 516 (блок # 5060)
ORA-27072: Ошибка ввода/вывода файла
Linux-x86_64 Error: 28: No space left on device
Additional information: 4
Additional information: 5060
Additional information: 4294967295
ORA-06512: на  "DW_DATA.PKG_LOAD_SALES", line 31
ORA-06512: на  line 7
01114. 00000 -  "IO error writing block to file %s (block # %s)"
*Cause:    The device on which the file resides is probably offline. If the
           file is a temporary file, then it is also possible that the device
           has run out of space. This could happen because disk space of
           temporary files is not necessarily allocated at file creation time.
*Action:   Restore access to the device or remove unnecessary files to free
           up space.
```

So, in the task below I will be used my DW_CL layer data, which was available when I performing this task.

2.1. Task 01: Create Ad Hoc SQL FIRST_VALUE, LAST_VALUE

Selecting revenue for stores and showing the store with highest and lowest revenue for each country.

```
4  SELECT  sl.country,
5          sl.store_address,
6          FIRST_VALUE(sl.store_address)
7                  OVER(PARTITION BY sl.country ORDER BY sl.country, SUM(sl.amount * pr.price) DESC) AS first_store,
8          LAST_VALUE(sl.store_address)
9                  OVER(PARTITION BY sl.country ORDER BY sl.country, SUM(sl.amount * pr.price) DESC
10                     RANGE BETWEEN UNBOUNDED PRECEDING AND
11                     UNBOUNDED FOLLOWING) AS last_store,
12         SUM(sl.amount * pr.price) AS revenue
13 FROM dw_cl.dw_cl_sale_data sl
14 JOIN dw_cl.dw_cl_product_data pr
15 ON sl.sku_num = pr.sku_num
16 GROUP BY sl.country, sl.store_address
17 ORDER BY sl.country, revenue DESC;
```

	COUNTRY	STORE_ADDRESS	FIRST_STORE	LAST_STORE	REVENUE
1	Belarus	Minks, Kalinouskaga, 33	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	134430,9
2	Belarus	Mogilev, Kalinouskaga, 17	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	133883,5
3	Belarus	Brest, Kalinouskaga, 47	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	133828,42
4	Belarus	Grodno, Kalinouskaga, 7	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	133331,64
5	Belarus	Grodno, Savetskaya, 2	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	133314,59
6	Belarus	Minks, Byady, 3	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	133220,49
7	Belarus	Slonim, Skaryny, 18	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	132885,8
8	Belarus	Minks, Zaporozhskaya, 73	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	132875,21
9	Belarus	Vitebsk, Kalinouskaga, 9	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	132807,74
10	Belarus	Novogrudok, Kalinouskaga, 1	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	132779,85
11	Belarus	Grodno, Kirova, 13	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	132625,4
12	Belarus	Gomel, Kalinouskaga, 6	Minks, Kalinouskaga, 33	Gomel, Kalinouskaga, 6	132294,23
13	Kazakhstan	Astana, Kalinouskaga, 90	Astana, Kalinouskaga, 90	Astana, Kalinouskaga, 90	132441,7
14	Russian Federation	Moscow, Kalinouskaga, 12	Moscow, Kalinouskaga, 12	Saint Petersburg, Kalinouskaga, 90	133916,95
15	Russian Federation	Saint Petersburg, Kalinouskaga, 90	Moscow, Kalinouskaga, 12	Saint Petersburg, Kalinouskaga, 90	132840,56
16	Ukraine	Kyiv, Kalinouskaga, 11	Kyiv, Kalinouskaga, 11	Kyiv, Kalinouskaga, 11	133878,56

2.2. Task 02: Create Ad Hoc SQL RANK, DENSE_RANK, ROWNUM

Showing the difference between RANK, DENSE_RANK and ROW_NUMBER functions by selecting products for each day, store and product brand:

```
22  SELECT  date_id,
23          store_address,
24          product_brand,
25          product_name,
26          RANK() OVER (PARTITION BY date_id, store_address, product_brand ORDER BY product_name) AS rank,
27          DENSE_RANK() OVER (PARTITION BY date_id, store_address, product_brand ORDER BY product_name) AS dense_rank,
28          ROW_NUMBER() OVER (PARTITION BY date_id, store_address, product_brand ORDER BY product_name) AS row_number
29  FROM dw_cl.dw_cl_sale_data
30  ORDER BY date_id, store_address,product_brand, product_name;
```

	DATE_ID	STORE_ADDRESS	PRODUCT_BRAND	PRODUCT_NAME	RANK	DENSE_RANK	ROW_NUMBER
1	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Classic 1 liter	1	1	1
2	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Classic 1 liter	1	1	2
3	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Dark 1.5 liter	3	2	3
4	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Dark 2 liter	4	3	4
5	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Dark 2 liter	4	3	5
6	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Dark 2 liter	4	3	6
7	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Light 0.5 liter	7	4	7
8	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Light 0.5 liter	7	4	8
9	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Light 1.5 liter	9	5	9
10	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Light 1.5 liter	9	5	10
11	01.01.21	Astana, Kalinouskaga, 90	Alivarski	Alivarski Light 2 liter	11	6	11
12	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Cranberry 2 liter	1	1	1
13	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Cranberry 2 liter	1	1	2
14	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Cranberry 2 liter	1	1	3
15	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Cranberry 2 liter	1	1	4
16	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Dark 1 liter	5	2	5
17	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Dark 1.5 liter	6	3	6
18	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Dark 2 liter	7	4	7
19	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Light 0.5 liter	8	5	8
20	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Light 1.5 liter	9	6	9
21	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Light 2 liter	10	7	10
22	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Orange 0.5 liter	11	8	11
23	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Orange 0.5 liter	11	8	12
24	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Orange 1.5 liter	13	9	13
25	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Orange 2 liter	14	10	14
26	01.01.21	Astana, Kalinouskaga, 90	Hatni	Hatni Orange 2 liter	14	10	15

2.3. Task 03: Create Ad Hoc SQL AGGREAGATE FUNCS

Selecting daily revenue for each store. Also showing maximum, minimum and average daily revenue:

```
35  SELECT date_id,
36         store_address,
37         SUM(amount * price) AS revenue,
38         MAX(SUM(amount * price)) OVER (PARTITION BY date_id) maximum,
39         MIN(SUM(amount * price)) OVER (PARTITION BY date_id) minimum,
40         AVG(SUM(amount * price)) OVER (PARTITION BY date_id) average
41  FROM dw_cl.dw_cl_sale_data sl
42  JOIN dw_cl.dw_cl_product_data pr
43  ON sl.sku_num = pr.sku_num
44  GROUP BY date_id, store_address
45  ORDER BY date_id, revenue DESC;
```

	DATE_ID	STORE_ADDRESS	REVENUE	MAXIMUM	MINIMUM	AVERAGE
1	01.01.21	Grodno, Kirova, 13	327,49	327,49	200,39	255,3675
2	01.01.21	Mogilev, Kalinouskaga, 17	298,52	327,49	200,39	255,3675
3	01.01.21	Brest, Kalinouskaga, 47	292,03	327,49	200,39	255,3675
4	01.01.21	Slonim, Skaryny, 18	290,16	327,49	200,39	255,3675
5	01.01.21	Vitebsk, Kalinouskaga, 9	266,1	327,49	200,39	255,3675
6	01.01.21	Novogrudok, Kalinouskaga, 1	261,98	327,49	200,39	255,3675
7	01.01.21	Moscow, Kalinouskaga, 12	259,95	327,49	200,39	255,3675
8	01.01.21	Minks, Zaporozhskaya, 73	257,7	327,49	200,39	255,3675
9	01.01.21	Kyiv, Kalinouskaga, 11	255,01	327,49	200,39	255,3675
10	01.01.21	Minks, Kalinouskaga, 33	246,54	327,49	200,39	255,3675
11	01.01.21	Minks, Byady, 3	235,65	327,49	200,39	255,3675
12	01.01.21	Saint Petersburg, Kalinouskaga, 90	224,68	327,49	200,39	255,3675
13	01.01.21	Astana, Kalinouskaga, 90	224,4	327,49	200,39	255,3675
14	01.01.21	Grodno, Kalinouskaga, 7	224,26	327,49	200,39	255,3675
15	01.01.21	Grodno, Savetskaya, 2	221,02	327,49	200,39	255,3675
16	01.01.21	Gomel, Kalinouskaga, 6	200,39	327,49	200,39	255,3675
17	02.01.21	Grodno, Savetskaya, 2	286,96	286,96	171,9	246,725625
18	02.01.21	Novogrudok, Kalinouskaga, 1	286,5	286,96	171,9	246,725625
19	02.01.21	Mogilev, Kalinouskaga, 17	281,58	286,96	171,9	246,725625
20	02.01.21	Saint Petersburg, Kalinouskaga, 90	277,68	286,96	171,9	246,725625
21	02.01.21	Slonim, Skaryny, 18	271,61	286,96	171,9	246,725625
22	02.01.21	Brest, Kalinouskaga, 47	263,2	286,96	171,9	246,725625
23	02.01.21	Grodno, Kirova, 13	258,94	286,96	171,9	246,725625
24	02.01.21	Kyiv, Kalinouskaga, 11	241,48	286,96	171,9	246,725625
25	02.01.21	Minks, Zaporozhskaya, 73	239,18	286,96	171,9	246,725625
26	02.01.21	Moscow, Kalinouskaga, 12	238,98	286,96	171,9	246,725625