RUZ0096 PDBS 4.cvičení

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1 Oracle

1.1 Úkol 4: Dotazy

SELECT lname, fname, residence, COUNT(*) AS records FROM Customer GROUP BY lname, fname, residence;

SELECT lname, fname, COUNT(*) AS records FROM Customer GROUP BY lname, fname;

SELECT lname, residence, COUNT(*) AS records FROM Customer GROUP BY lname, residence;

###	**MIN. COUNT**	**MIN. VALUES**	**MAX. COUNT**	**MAX. VALUES**
lname, fname, residence	26	Nováková,Alena,Přerov	184	Veselá,Věra,Zlín
lname a fname	693	Nováková,Jana	2911	Novotná,Lucie
lname a residence	296	Pospíšilová,Praha	1403	Novotná,Karlovy Vary

1.2 Úkol 4: QEP: halda a index

1.3 Plán bez indexu

```
Plan hash value: 2844954298

---------------------------------------------------------------------------
| Id  | Operation         | Name     | Rows  | Bytes | Cost (%CPU)| Time     |
---------------------------------------------------------------------------
|   0 | SELECT STATEMENT  |          |   115 |  4715 |   552   (2)| 00:00:01 |
|*  1 |  TABLE ACCESS FULL| CUSTOMER |   115 |  4715 |   552   (2)| 00:00:01 |
---------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

   1 - filter("RESIDENCE"='Jihlava' AND "LNAME"='Veselá' AND
              "FNAME"='Věra')

Note
-----
   - automatic DOP: Computed Degree of Parallelism is 1 because of parallel threshold
```

1.3.1 IO Cost, CPU Time, Vysvětlení použití plánu

```
[2025-03-17 23:29:08] completed in 13 ms
---- Query Processing Statistics ----
executions:     1
buffer gets:    1957
cpu_time_ms:    0
elapsed_time_ms:    11.072
rows_processed:     74
username:   RUZ0096
query:  select * from CUSTOMER where lname like 'Veselá' and fname like 'Věra' and RESIDENCE like 'Jihlava'
```

Databázový systém použil **Table access full (průchod haldou)**, protože neexistuje index. Další z důvodu je, že **po where klauzuli se nevyskytuje primary key**, tudíž DS **musí projít veškeré záznamy**.

1.4 Popis haldy

blocks	2048
size (MB)	16
used_blocks	2048
size used (MB)	16
unused_blocks	0
size unused (MB)	0

1.5 Popis indexu

INDEX_NAME	CUSTOMER_NAME_RES
Velikost indexu (MB)	13
NUM_ROWS	300 000
LEAF_BLOCKS	1559
DISTINCT KEYS	2600
TIME (ms)	896
Blocks	1664

1.5.1 Plán pro select s indexem

```
PLAN_TABLE_OUTPUT
Plan hash value: 3304523282

-----------------------------------------------------------------------------------------------------
| Id  | Operation                           | Name              | Rows  | Bytes | Cost (%CPU)| Time     |
-----------------------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT                    |                   |   115 |  4715 |   115   (0)| 00:00:01 |
|   1 |  TABLE ACCESS BY INDEX ROWID BATCHED| CUSTOMER          |   115 |  4715 |   115   (0)| 00:00:01 |
|*  2 |   INDEX RANGE SCAN                  | CUSTOMER_NAME_RES |   115 |       |     3   (0)| 00:00:01 |
-----------------------------------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

   2 - access("LNAME"='Veselá' AND "FNAME"='Věra' AND "RESIDENCE"='Jihlava')

Note
-----
   - automatic DOP: Computed Degree of Parallelism is 1 because of parallel threshold
```

1.5.2 IO Cost, CPU Time, Vysvětlení použití plánu

```
[2025-03-18 00:25:09] completed in 14 ms
---- Query Processing Statistics ----
executions:     2
buffer gets:    75
cpu_time_ms:    0
elapsed_time_ms:    .8285
rows_processed:     74
username:   RUZ0096
query:  select * from CUSTOMER where lname like 'Veselá' and fname like 'Věra' and RESIDENCE like 'Jihlava'
```

Databázový systém použil vyhledávání pomocí **indexů**, protože IO Cost vyšel lépe.

1.5.3 lname fname MIN

- **buffer gets:** 1386
- **cpu_time_ms:** 0
- **elapsed_time_ms:** 8.716

```
PLAN_TABLE_OUTPUT
Plan hash value: 2844954298

-----------------------------------------------------------------------------
| Id  | Operation         | Name     | Rows  | Bytes | Cost (%CPU)| Time     |
-----------------------------------------------------------------------------
|   0 | SELECT STATEMENT  |          |  2308 | 94628 |   552   (2)| 00:00:01 |
|*  1 |  TABLE ACCESS FULL| CUSTOMER |  2308 | 94628 |   552   (2)| 00:00:01 |
-----------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

   1 - filter("LNAME"='Nováková' AND "FNAME"='Jana')

Note
-----
   - automatic DOP: Computed Degree of Parallelism is 1 because of parallel threshold
```

1.5.4 lname fname MAX

- **buffer gets:** 365
- **cpu_time_ms:** 0
- **elapsed_time_ms:** 2.956

```
PLAN_TABLE_OUTPUT
Plan hash value: 2844954298

---------------------------------------------------------------------------
| Id  | Operation         | Name     | Rows  | Bytes | Cost (%CPU)| Time     |
---------------------------------------------------------------------------
|   0 | SELECT STATEMENT  |          |  2308 | 94628 |   552   (2)| 00:00:01 |
|*  1 |  TABLE ACCESS FULL| CUSTOMER |  2308 | 94628 |   552   (2)| 00:00:01 |
---------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

   1 - filter("LNAME"='Dvořáková' AND "FNAME"='Eva')

Note
-----
   - automatic DOP: Computed Degree of Parallelism is 1 because of parallel threshold
```

1.5.5 Velikost indexu

- **Blocks:** 1664
- **Size(MB):** 13

2 Microsoft SQL Server

2.1 Úkol 4: Dotazy

###	MIN. COUNT	MIN. VALUES	MAX. COUNT	MAX. VALUES
lname, fname, residence	27	Němec,Michal,Šumperk	85	Kučerová,Věra,Bohumín
lname a fname	756	Černý,Tomáš	1269	Procházková,Lenka
lname a residence	505	Dvořáková,Beroun	694	Krejčí,Prostějov

2.2 Úkol 4: QEP: halda a index

2.2.1 Bez indexu

- **CPU time** = 62 ms
- **elapsed time** = 53 ms
- **logical reads** = 1750
- **physical reads** = 0
- —**Table Scan**(OBJECT:([RUZ0096].[dbo].[Customer]), WHERE:....

Vysvětlení viz Oracle.

2.2.2 S indexem

name	height	level	page_count	record_count	avg_record_size	page_utilization	avg_frag
CUSTOMER_NAME_RES	2	0	1573	300000	39.997	98.9	1.53
CUSTOMER_NAME_RES	2	1	23	1573	43.389	38.3	86.96
CUSTOMER_NAME_RES	2	2	1	23	42.869	12.7	0

- **index** byl **vytvořen** za **237 ms**
- **CPU time** = 0 ms
- **elapsed time** = 4 ms
- **logical reads** = 153
- **physical reads** = 0
- —**Nested Loops** —**Index Seek** —**RID Lookup**

Vysvětlení viz Oracle.

2.2.3 lname fname MIN

- **P. položek** = 756
- **CPU time** = 31 ms
- **elapsed time** = 31 ms
- **logical reads** = 1145
- **physical reads** = 0
- **——Table Scan(OBJECT:([RUZ0096].[dbo]...**

2.2.4 lname fname MAX

- **P. položek** = 1269
- **CPU time** = 15 ms
- **elapsed time** = 18 ms
- **logical reads** = 686
- **physical reads** = 0
- **——Table Scan(OBJECT:([RUZ0096].[dbo]...**

2.2.5 Velikost haldy

- **Total Pages:** 1753
- **Total Pages (MB):** 13.7
- **Used Pages:** 1751
- **Used Pages (MB):** 13.7

2.2.6 Velikost indexu

- **Total Pages:** 1874
- **Total Pages (MB):** 14.6
- **Used Pages:** 1623
- **Used Pages (MB):** 12.7