

Ćwiczenie Bazy Danych

Grupa: 1	Imię, Nazwisko : Marcin Chrobak	Data: 19.05.2020
Temat: Transakcje	Ocena:	

Cel ćwiczenia: zapoznanie się z poziomami izolacji w transakcjach baz relacyjnych

ZADANIE 0:

```
MariaDB [(none)]> Create database trans_db;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> create user trans_db identified by 'trans_db';
Query OK, 0 rows affected (0.031 sec)

MariaDB [(none)]> Grant all privileges on *.* to trans_db;
Query OK, 0 rows affected (1.283 sec)

# mysql -utrans_db -p
Enter password: *****
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 9
Server version: 10.4.11-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> SELECT USER(), CURRENT_USER();
+-----+
| USER() | CURRENT_USER() |
+-----+
| trans_db@localhost | trans_db@%      |
+-----+
1 row in set (0.000 sec)

MariaDB [(none)]> create table tab(int p);
ERROR 1046 (3D000): No database selected
MariaDB [(none)]> use trans_db;
Database changed
MariaDB [trans_db]> create table tab(int p);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'int p)' at line 1
MariaDB [trans_db]> create table tab(p int(11));
Query OK, 0 rows affected (0.668 sec)

MariaDB [trans_db]> INSERT INTO p values(1);
ERROR 1146 (42S02): Table 'trans_db.p' doesn't exist
MariaDB [trans_db]> INSERT INTO tab values(1);
Query OK, 1 row affected (0.412 sec)

MariaDB [trans_db]> INSERT INTO tab values(2);
Query OK, 1 row affected (0.118 sec)
```

ZADANIE 1:

```
MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p=11 WHERE p=1;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [trans_db]> SELECT * FROM taqb;
ERROR 1146 (42S02): Table 'trans_db.taqb' doesn't exist
MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p     |
+-----+
| 11    |
| 2     |
+-----+
2 rows in set (0.000 sec)

MariaDB [trans_db]> ROLLBACK;
Query OK, 0 rows affected (0.377 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p     |
+-----+
| 1     |
| 2     |
+-----+
2 rows in set (0.000 sec)
```

- wykonanie wycofania transakcji – ROLLBACK

ZADANIE 2:

```
MariaDB [trans_db]> Begin;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 2 |
+-----+
2 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 2 |
+-----+
2 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 2 |
+-----+
2 rows in set (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p=22 WHERE p =2;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1 Changed: 1 Warnings: 0

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.363 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
+-----+
2 rows in set (0.000 sec)

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
+-----+
2 rows in set (0.000 sec)

MariaDB [trans_db]>
```

```
XAMPP for Windows - mysql -utrans_db -p
# mysql -utrans_db -p
Enter password: *****
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 10
Server version: 10.4.11-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> use trans_db;
Database changed
MariaDB [trans_db]> Begin;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p=22 WHERE p =2;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1 Changed: 1 Warnings: 0

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.363 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
+-----+
2 rows in set (0.000 sec)

MariaDB [trans_db]>
```

- po zatwierdzeniu transakcji poleceniem COMMIT – zaaktualizowane dane.

ZADANIE 3:

```
MariaDB [trans_db]> INSERT INTO tab VALUES(3);
Query OK, 1 row affected (0.144 sec)

MariaDB [trans_db]> INSERT INTO tab VALUES(4);
Query OK, 1 row affected (0.032 sec)

MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab FOR UPDATE;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 4 |
+-----+
4 rows in set (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p=44 WHERE p=4;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1 Changed: 1 Warnings: 0

MariaDB [trans_db]> COMMIT
-> ;
Query OK, 0 rows affected (0.379 sec)

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
+-----+
4 rows in set (0.000 sec)

MariaDB [trans_db]>
```

```
XAMPP for Windows - mysql -utrans_db -p
2 rows in set (0.000 sec)

MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 4 |
+-----+
4 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab FOR UPDATE;
ERROR 1205 (HY000): Lock wait timeout exceeded; try restarting transaction
MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
+-----+
4 rows in set (0.000 sec)

MariaDB [trans_db]>
```

- przy klauzuli FOR UPDATE należy najpierw wykonać COMMIT aby zobaczyć zmiany bo inaczej występuje błąd – timeout

ZADANIE 4:

```
MariaDB [trans_db]> SELECT * FROM tab LOCK IN SHARE MODE;
+----+
| p  |
+----+
| 1  |
| 22 |
| 3  |
| 44 |
+----+
4 rows in set (0.000 sec)

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+----+
| p  |
+----+
| 1  |
| 22 |
| 3  |
| 44 |
+----+
4 rows in set (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p=222 WHERE p =22;
ERROR 1205 (HY000): Lock wait timeout exceeded; try restarting transaction
MariaDB [trans_db]> SELECT * FROM tab;
+----+
| p  |
+----+
| 1  |
| 22 |
| 3  |
| 44 |
+----+
4 rows in set (0.000 sec)

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+----+
| p  |
+----+
| 1  |
| 22 |
| 3  |
| 44 |
+----+
4 rows in set (0.000 sec)

MariaDB [trans_db]>
```

- przy LOCK IN SHARE MODE brak możliwości wykonania polecenia UPDATE

ZADANIE 5:

```
MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> INSERT INTO tab VALUES(5);
Query OK, 1 row affected (0.002 sec)

MariaDB [trans_db]> SEVEPOINT 5;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'SEVEPOINT 5' at line 1
MariaDB [trans_db]> SAVEPOINT id;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> INSERT INTO tab VALUES(6);
Query OK, 1 row affected (0.000 sec)

MariaDB [trans_db]> INSERT INTO tab VALUES(67);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near '' at line 1
MariaDB [trans_db]> INSERT INTO tab VALUES(7);
Query OK, 1 row affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+----+
| p  |
+----+
| 1  |
| 22 |
| 3  |
| 44 |
| 5  |
| 6  |
| 7  |
+----+
7 rows in set (0.000 sec)

MariaDB [trans_db]> ROLLBACK TO id;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'ROLLBACK TO id' at line 1
MariaDB [trans_db]> ROLLBACK TO id;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+----+
| p  |
+----+
| 1  |
| 22 |
| 3  |
| 44 |
| 5  |
+----+
5 rows in set (0.000 sec)

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.122 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+----+
| p  |
+----+
| 1  |
| 22 |
| 3  |
| 44 |
| 5  |
+----+
5 rows in set (0.000 sec)

MariaDB [trans_db]>
```

- Dzięki wykorzystaniu SAVEPOINT id występuje możliwość przywrócenia zmian do zapisanego miejsca poleceniem ROLLBACK TO id

ZADANIE 6:

```
MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> INSERT INTO tab VALUES(6);
Query OK, 1 row affected (0.354 sec)

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.383 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 6 |
+-----+
6 rows in set (0.001 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
+-----+
6 rows in set (0.000 sec)

MariaDB [trans_db]> _
```

```
XAMPP for Windows - mysql -utrans_db -p

4 rows in set (0.000 sec)

MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
+-----+
5 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
+-----+
5 rows in set (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p=66 WHERE p=6;
Query OK, 1 row affected (0.335 sec)
Rows matched: 1 Changed: 1 Warnings: 0

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
+-----+
6 rows in set (0.000 sec)

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.361 sec)
```

- możliwość edycji wprowadzonego rekordu w drugiej sesji, mimo braku wyświetlenia go za pomocą polecenia SELECT – po UPDATE rekord już widoczny.

Zadania 1-6 wykonane wykorzystując izolacje typu REPEATABLE READ

ZADANIE 7:

```

MariaDB [(none)]> use trans_db;
Database changed
MariaDB [trans_db]> SELECT @@tx_isolation;
+-----+
| @@tx_isolation |
+-----+
| READ-UNCOMMITTED |
+-----+
1 row in set (0.000 sec)

MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p =99 WHERE p = 9;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [trans_db]> ROLLBACK;
Query OK, 0 rows affected (0.112 sec)

MariaDB [trans_db]> SELECT* FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
| 7 |
| 8 |
| 9 |
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]>

```

```

MariaDB [(none)]> USE trans_db;
Database changed
MariaDB [trans_db]> SELECT @@tx_isolation;
+-----+
| @@tx_isolation |
+-----+
| READ-UNCOMMITTED |
+-----+
1 row in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
| 7 |
| 8 |
| 9 |
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
| 7 |
| 8 |
| 99 |
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
| 7 |
| 8 |
| 9 |
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]>

```

- izolacja: READ UNCOMMITTED – w drugiej sesji wyświetlanie niezakończonych zmian.

```

MariaDB [trans_db]> SELECT @@tx_isolation;
+-----+
| @@tx_isolation |
+-----+
| READ-COMMITTED |
+-----+
1 row in set (0.000 sec)

MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p =99 WHERE p = 9;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [trans_db]> ROLLBACK;
Query OK, 0 rows affected (0.122 sec)

MariaDB [trans_db]>

```

```

MariaDB [(none)]> use trans_db;
Database changed
MariaDB [trans_db]> SELECT @@tx_isolation;
+-----+
| @@tx_isolation |
+-----+
| READ-COMMITTED |
+-----+
1 row in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
| 7 |
| 8 |
| 9 |
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22 |
| 3 |
| 44 |
| 5 |
| 66 |
| 7 |
| 8 |
| 9 |
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]>

```

- izolacja: READ COMMITTED – w drugiej sesji wyświetlanie niezakończonych zmian jest nieosiągalne – należy zakomitować zmiany aby wyświetlić dane po UPDATE

```

MariaDB [(none)]> use trans_db;
Database changed
MariaDB [trans_db]> SELECT @@tx_isolation;
+-----+
| @@tx_isolation |
+-----+
| SERIALIZABLE   |
+-----+
1 row in set (0.000 sec)

MariaDB [trans_db]> BEGIN;
Query OK, 0 rows affected (0.000 sec)

MariaDB [trans_db]> UPDATE tab SET p =99 WHERE p = 9;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [trans_db]> COMMIT;
Query OK, 0 rows affected (0.124 sec)

MariaDB [trans_db]>

```

```

MariaDB [(none)]> use trans_db;
Database changed
MariaDB [trans_db]> SELECT @@tx_isolation;
+-----+
| @@tx_isolation |
+-----+
| SERIALIZABLE   |
+-----+
1 row in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22|
| 3 |
| 44|
| 5 |
| 66|
| 7 |
| 8 |
| 9 |
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]> SELECT * FROM tab;
+-----+
| p |
+-----+
| 1 |
| 22|
| 3 |
| 44|
| 5 |
| 66|
| 7 |
| 8 |
| 99|
+-----+
9 rows in set (0.000 sec)

MariaDB [trans_db]>

```

- izolacja: SERIALIZABLE – dopiero po COMMIT w pierwszej sesji widoczne zmiany w drugiej sesji.