Assignment 6

Concurrency Tuning

Database Tuning

New Group 8
Frauenschuh Florian, 12109584
Lindner Peter, 12101607
Weilert Alexander, 12119653

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Notes

- You will need to run transactions concurrently using threads in Java. See `https://dbresearch.uni-salzburg.at/teaching/2020ss/dbt/account.zip` for an example.

Experimental Setup

For our experiments we used the following hardware and software:

Component	Specs
Processor	i7-13700H 3.7-5.0 GHz
Memory	32 GiB

Table 1: Hardware: Dell XPS 15 9530

Software	Version
OS	Ubuntu 22.04
Postgres	2.3.4
postgresql	42.7.3
MariaDB	10.6.16
mariadb-java-client	3.3.3
Java	18

Table 2: Software

Before each test run we created the table `accounts` by

```
CREATE TABLE IF NOT EXISTS accounts (
  account INT,
  balance INT
);
```

and inserted the initial data by using batch statements.

Solution (a)

Read Committed Throughput and correctness for solution (a) with isolation level `READ COMMITTED`.

#Concurrent Transactions	Throughput [transactions/sec]	Correctness
1	714.28	1.0
2	1123.59	0.87
3	1176.47	0.89
4	1020.4	0.87
5	1315.79	0.93

Serializable Throughput and correctness for solution (a) with isolation level `SERIALIZABLE`.

#Concurrent Transactions	Throughput [transactions/sec]	Correctness
1	645.16	1.0
2	1052.63	0.84
3	1333.33	0.93
4	1111.11	0.89
5	1265.82	0.96

Solution (b)

Read Committed Throughput and correctness for solution (b) with isolation level `READ COMMITTED`.

#Concurrent Transactions	Throughput [transactions/sec]	Correctness
1	917.43	1.0
2	1219.51	1.0
3	1315.79	1.0
4	1333.33	1.0
5	1408.45	1.0

Serializable Throughput and correctness for solution (b) with isolation level `SERIALIZABLE`.

#Concurrent Transactions	Throughput [transactions/sec]	Correctness
1	943.39	1.0
2	1219.51	1.0
3	1298.7	1.0
4	1369.86	1.0
5	1408.45	1.0

Discussion

Discuss the outcomes and explain the difference between the isolation levels in PostgreSQL with respect to your experiment.

Explain **with your own words** how PostgreSQL deals with updates in the different isolation levels, within a transaction and within a single SQL command. Explicitly explain why you got the experimental results for solution (a) and (b), respectively.

Solution (a)

[Your answer goes here . . .]

Solution (b)

[Your answer goes here ...]

Time Spent on this Assignment

Time in hours per person:

- Florian Frauenschuh: **x**
- Peter Lindner: **y**
- Alexander Weilert: **z**

References

Important: Reference your information sources!
Remove this section if you use footnotes to reference your information sources.
