Zaawansowane technologie bazodanowe
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Lab5

Czasy wyszukiwania rekordów pominąłem ze względu na mało znaczące wyniki. Dziwi mnie wynik Multiple Transactions dla File w trybie WAL - **7.508222.** Po researchu nadal nie jestem w stanie wytłumaczyć skąd się wziął tak niski wynik. Output konsolowy wraz z czasem wyszukiwania rekordów i zużyciem pamięci programu C umieszczam na następnej stronie.

Czas 1 000 000 insertów						
Python						
	MEMORY			FILE		
	DELETE	WAL	OFF	DELETE	WAL	OFF
AUTOCOMMIT=TRUE	1.3747	1.3515	0.8941	464.4392	132.7562	28.0767
AUTOCOMMIT=FALSE	0.8492	0.8092	0.847	1.3248	1.2181	0.8448
C						
	MEMORY			FILE		
	DELETE	WAL	OFF	DELETE	WAL	OFF
SINGLE TRANSACTION	0.967133	0.951545	0.987988	0.991205	1.023119	1.012062
MULTIPLE TRANSACTION	1.481854	1.456857	1.442947	184.237717	7.508222	184.430603

Komentarz odnośnie wyników:

Oczywistym są krótsze czasy przy zmianie trybu journal. Zaskakującym jest ogromna różnica przy zmianie trybu journal z **DELETE** na **WAL** przy bazie danej plikowej w Pythonie. Warto również zaznaczyć, jak dużo daje nam wrapowanie insertów w jedną transakcję (zysk 400ms dla języka C), podobnie w Python przy zmianie autocommit i manualnym commitowaniu transakcji (jednakże wydaje się - po 20 moich testach - nie mieć wpływu przy journal mode **OFF**).

```
>python ex4.py
=== AUTOCOMMIT TRANSACTION IN :memory: ===
Journal mode: DELETE
[GEN]Elapsed time: 1.3868 s
[SCAN]Elapsed time: 0.0000 s

=== NOAUTOCOMMIT TRANSACTION IN :memory: ===
Journal mode: DELETE
[GEN]Elapsed time: 0.8492 s
[SCAN]Elapsed time: 0.0000 s

=== AUTOCOMMIT TRANSACTION IN :memory: ===
Journal mode: WAL
[GEN]Elapsed time: 1.4061 s
[SCAN]Elapsed time: 0.0000 s

=== NOAUTOCOMMIT TRANSACTION IN :memory: ===
Journal mode: WAL
[GEN]Elapsed time: 0.8092 s
[SCAN]Elapsed time: 0.0000 s

=== AUTOCOMMIT TRANSACTION IN :memory: ===
Journal mode: OFF
[GEN]Elapsed time: 0.9089 s
[SCAN]Elapsed time: 0.0000 s

=== NOAUTOCOMMIT TRANSACTION IN :memory: ===
Journal mode: OFF
[GEN]Elapsed time: 0.8470 s
[SCAN]Elapsed time: 0.0000 s

=== AUTOCOMMIT TRANSACTION IN data.db ===
Journal mode: DELETE
[GEN]Elapsed time: 464.4392 s
[SCAN]Elapsed time: 0.0002 s

=== NOAUTOCOMMIT TRANSACTION IN data.db ===
Journal mode: DELETE
[GEN]Elapsed time: 1.3248 s
[SCAN]Elapsed time: 0.0000 s

=== AUTOCOMMIT TRANSACTION IN data.db ===
Journal mode: WAL
```

```
[GEN]Elapsed time: 132.7562 s
[SCAN]Elapsed time: 0.0000 s

=== NOAUTOCOMMIT TRANSACTION IN data.db ===
Journal mode: WAL
[GEN]Elapsed time: 1.2181 s
[SCAN]Elapsed time: 0.0000 s

=== AUTOCOMMIT TRANSACTION IN data.db ===
Journal mode: OFF
[GEN]Elapsed time: 28.0767 s
[SCAN]Elapsed time: 0.0000 s

=== NOAUTOCOMMIT TRANSACTION IN data.db ===
Journal mode: OFF
[GEN]Elapsed time: 0.8448 s
[SCAN]Elapsed time: 0.0001 s
```

>make ex2

```
gcc -o main main.c -lsqlite3
gcc -o ex1 ex1.c
gcc -o ex2_mem_single_off ex2.c -lsqlite3 -DSINGLE_TRANSACTION -DMEM
-DJOURNAL_OFF # mem, single
gcc -o ex2_mem_single_delete ex2.c -lsqlite3 -DSINGLE_TRANSACTION -DMEM
-DJOURNAL_DELETE # mem, single
gcc -o ex2_mem_single_wal ex2.c -lsqlite3 -DSINGLE_TRANSACTION -DMEM
-DJOURNAL_WAL # mem, single
gcc -o ex2_file_single_off ex2.c -lsqlite3 -DSINGLE_TRANSACTION
-DJOURNAL_OFF # file, single
gcc -o ex2_file_single_delete ex2.c -lsqlite3 -DSINGLE_TRANSACTION
-DJOURNAL_DELETE # file, single
gcc -o ex2_file_single_wal ex2.c -lsqlite3 -DSINGLE_TRANSACTION
-DJOURNAL_WAL # file, single
gcc -o ex2_mem_multiple_off ex2.c -lsqlite3 -DMEM -DJOURNAL_OFF # mem,
multiple
gcc -o ex2_mem_multiple_delete ex2.c -lsqlite3 -DMEM -DJOURNAL_DELETE #
mem, multiple
gcc -o ex2_mem_multiple_wal ex2.c -lsqlite3 -DMEM -DJOURNAL_WAL # mem,
multiple
gcc -o ex2_file_multiple_off ex2.c -lsqlite3 -DJOURNAL_OFF # file, multiple
gcc -o ex2_file_multiple_delete ex2.c -lsqlite3 -DJOURNAL_DELETE # file,
multiple
```

```
gcc -o ex2_file_multiple_wal ex2.c -lsqlite3 -DJOURNAL_WAL # file, multiple
=== SINGLE TRANSACTION IN MEMORY ===
Journal mode: OFF
[GEN]Elapsed time:        0.987988s
Found: name_999999
[SCAN]Elapsed time:       0.000022s
Max mem usage:      146.453125MB

=== SINGLE TRANSACTION IN MEMORY ===
Journal mode: DELETE
[GEN]Elapsed time:        0.967133s
Found: name_999999
[SCAN]Elapsed time:       0.000026s
Max mem usage:      146.171875MB

=== SINGLE TRANSACTION IN MEMORY ===
Journal mode: WAL
[GEN]Elapsed time:        0.951545s
Found: name_999999
[SCAN]Elapsed time:       0.000021s
Max mem usage:      146.203125MB

=== SEPARATE TRANSACTIONS IN MEMORY ===
Journal mode: OFF
[GEN]Elapsed time:        1.442947s
Found: name_999999
[SCAN]Elapsed time:       0.000021s
Max mem usage:      146.328125MB

=== SEPARATE TRANSACTIONS IN MEMORY ===
Journal mode: DELETE
[GEN]Elapsed time:        1.481854s
Found: name_999999
[SCAN]Elapsed time:       0.000021s
Max mem usage:      147.031250MB

=== SEPARATE TRANSACTIONS IN MEMORY ===
Journal mode: WAL
[GEN]Elapsed time:        1.456857s
Found: name_999999
[SCAN]Elapsed time:       0.000019s
Max mem usage:      147.312500MB
```

```
=== SINGLE TRANSACTION IN FILE ===
 Journal mode: OFF
[GEN]Elapsed time:       1.012062s
Found: name_999999
[SCAN]Elapsed time:      0.000046s
Max mem usage:      146.656250MB

=== SINGLE TRANSACTION IN FILE ===
 Journal mode: DELETE
[GEN]Elapsed time:       0.991205s
Found: name_999999
[SCAN]Elapsed time:      0.000054s
Max mem usage:      146.328125MB

=== SINGLE TRANSACTION IN FILE ===
 Journal mode: WAL
[GEN]Elapsed time:       1.023119s
Found: name_999999
[SCAN]Elapsed time:      0.000039s
Max mem usage:      146.421875MB

=== SEPARATE TRANSACTIONS IN FILE ===
 Journal mode: OFF
[GEN]Elapsed time:       184.430603s
Found: name_999999
[SCAN]Elapsed time:      0.000032s
Max mem usage:      122.093750MB

=== SEPARATE TRANSACTIONS IN FILE ===
 Journal mode: DELETE
[GEN]Elapsed time:       184.237717s
Found: name_999999
[SCAN]Elapsed time:      0.000032s
Max mem usage:      122.406250MB

=== SEPARATE TRANSACTIONS IN FILE ===
 Journal mode: WAL
[GEN]Elapsed time:       7.508222s
Found: name_999999
[SCAN]Elapsed time:      0.000023s
Max mem usage:      122.140625MB
```