

Transactions I

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1 Administrivia

Announcements

Assignment

Using the *SQL Commands* chapter in the PostgreSQL online documentation (look under the *Reference* section), review the following SQL commands:

- BEGIN
- COMMIT
- LOCK
- ROLLBACK
- ROLLBACK TO
- SAVEPOINT
- SELECT, the FOR UPDATE/FOR SHARE clause
- SET TRANSACTION

to prepare for the transactions lab.

From Last Time

PL/pgSQL and triggers

Outline

1. Vocabulary
2. Transactions assignment

Coming Up

Transactions labs

2 Vocabulary

1. What is concurrency?
2. What is a transaction?
3. Describe each of the ACID properties:
 - (a) Atomicity
 - (b) Consistency
 - (c) Isolation
 - (d) Durability
4. Describe an example that illustrates how two concurrent transactions could leave a database in an inconsistent state.
5. What is a transaction schedule?
6. Define each of the following:
 - (a) Lost update
 - (b) Dirty read
 - (c) Inconsistent analysis
 - (d) Nonrepeatable read
 - (e) Phantom read
7. What is the difference between the serial execution of transactions and a serializable schedule of transactions?
8. How is serializability achieved?
9. When is a shared lock used? When is an exclusive lock used?
10. Describe a situation that illustrates deadlock.
11. Describe two-phase locking.

12. How is timestamping used to control transaction concurrency?
13. Describe three different scenarios which would require that a database be recovered.
14. Describe the ARIES recovery algorithm.

3 Transactions Assignment

Problems 9.4–9.7 and 9.13.