

Quiz: Transactions and Locks

Total Score: /15

Printed Name:

Instructions:

1. Each problem is worth 3 points.
2. For each problem:
 - (a) Circle all SQL commands that block.
 - (b) Write an X through all commands that error, even if the command previously blocked.
 - (c) Write the output of each `SELECT` statement. (You do not need to write column names, and the order of rows does not matter.)
 - (d) If the sequence of commands results in a deadlock, say so.

Rules:

1. You MAY:
 - (a) Use any handwritten/printed notes
 - (b) Use your computer
 - (c) Reference arbitrary written material on the internet, including the Postgres documentation
2. You MAY NOT:
 - (a) Communicate with another human being
 - (b) Connect to postgres and run commands

Problem 1:

Session 1

```
1 CREATE TABLE t (a INT UNIQUE);
2
3
4
5
6 BEGIN;
7
8 LOCK TABLE t IN SHARE MODE;
9 LOCK TABLE t IN EXCLUSIVE MODE;
10
11 LOCK TABLE u IN ROW SHARE MODE;
12
13 COMMIT;
```

Session 2

```
1
2 CREATE TABLE u (
3     b INT UNIQUE
4     DEFERRABLE INITIALLY DEFERRED
5 );
6
7 BEGIN;
8
9
10 LOCK TABLE u IN ROW SHARE MODE;
11
12 INSERT INTO t VALUES (5);
13
14 COMMIT;
```

Problem 2:

Session 1

```
1
2
3 BEGIN;
4 LOCK TABLE t IN SHARE MODE;
5
6 INSERT INTO u VALUES (5);
7
8 COMMIT;
```

Session 2

```
1 CREATE TABLE t ( a INT );
2 CREATE TABLE u ( a INT );
3
4
5 BEGIN;
6
7 LOCK TABLE u IN SHARE MODE;
8
9 INSERT INTO t VALUES (5);
10 COMMIT;
```

Problem 3:

Session 1

```
1 CREATE TABLE t (  
2     a INT UNIQUE  
3     DEFERRABLE INITIALLY DEFERRED  
4 );  
5 INSERT INTO t VALUES (1);  
6 INSERT INTO t VALUES (2);  
7 INSERT INTO t VALUES (3);  
8  
9 BEGIN;  
10 UPDATE t SET a=6 WHERE a=1;  
11  
12 UPDATE t SET a=7 WHERE a=1;  
13 COMMIT;
```

Session 2

```
1  
2  
3  
4  
5  
6  
7  
8 BEGIN;  
9  
10  
11 UPDATE t SET a=7 WHERE a=1;  
12  
13  
14 DELETE FROM t WHERE a=6;  
15 COMMIT;
```

Problem 4:

Session 1

```
1 CREATE TABLE t (a INT);
2 INSERT INTO t VALUES (1);
3 INSERT INTO t VALUES (2);
4 INSERT INTO t VALUES (3);
5
6 BEGIN;
7 LOCK TABLE t IN ROW SHARE MODE;
8 UPDATE t SET a=6 WHERE a=1;
9
10 UPDATE t SET a=7 WHERE a=2;
11
12 COMMIT;
```

Session 2

```
1
2
3
4
5 BEGIN;
6
7
8
9 UPDATE t SET a=7 WHERE a=2;
10
11 UPDATE t SET a=6 WHERE a=1;
12
13 COMMIT;
```

Problem 5:

Session 1

```
1 CREATE TABLE t ( a INT UNIQUE );
2 INSERT INTO t VALUES (1);
3 INSERT INTO t VALUES (2);
4 INSERT INTO t VALUES (3);
5
6
7
8 BEGIN;
9 INSERT INTO t VALUES (5);
10 INSERT INTO t VALUES (6);
11
12 INSERT INTO t VALUES (5);
13 COMMIT;
```

Session 2

```
1
2
3
4
5 BEGIN ISOLATION LEVEL
6 REPEATABLE READ;
7 SELECT count(*) FROM t;
8
9
10
11 SELECT count(*) FROM t;
12
13
14 SELECT count(*) FROM t;
15 COMMIT;
```