

## Quiz (Transactions and Locks)

**Instructions:** For each problem, you must perform all of the following tasks correctly in order to get credit.

1. Circle all SQL commands that block.
2. Write an X through all commands that error.
3. If a command causes a deadlock, write DEADLOCK and stop the problem.
4. Write the output of each SELECT statement.

You will be allowed to use a computer and access the internet, but you will not be allowed to connect to postgres and run postgres commands.

### Problem 1:

#### Session 1

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

#### Session 2

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

## Problem 2:

Session 1	Session 2
1 CREATE TABLE t (	1
2     a INT PRIMARY KEY	2
3         DEFERRABLE INITIALLY DEFERRED	3
4     );	4
5 BEGIN ISOLATION LEVEL	5
6 REPEATABLE READ;	6
7 INSERT INTO t VALUES (5);	7
8	8 BEGIN;
9	9 INSERT INTO t VALUES (6);
10 INSERT INTO t VALUES (6);	10
11 SELECT count(*) FROM t;	11
12	12 INSERT INTO t VALUES (5);
13	13 ABORT;
14 COMMIT;	

### Problem 3:

#### Session 1

```
1 CREATE TABLE t ( a INT );  
2 INSERT INTO t VALUES (9);  
3 INSERT INTO t VALUES (10);  
4 BEGIN;  
5  
6 UPDATE t SET a = a+1;  
7  
8 COMMIT;
```

#### Session 2

```
1  
2  
3  
4  
5 BEGIN;  
6  
7 DELETE FROM t WHERE a=10;  
8  
9 SELECT count(*) FROM t;  
10 COMMIT;
```

#### Problem 4:

##### Session 1

```
1 CREATE TABLE t (a INT PRIMARY KEY);
2
3
4
5
6 BEGIN;
7 INSERT INTO t VALUES (1);
8 INSERT INTO t VALUES (2);
9 INSERT INTO u VALUES (2);
10
11
12
13 SELECT count(*) FROM t;
14
15 INSERT INTO t VALUES (3);
16 COMMIT;
17
18
19
20 SELECT count(*) FROM t;
```

##### Session 2

```
1
2 CREATE TABLE u (
3     b INT REFERENCES t(a)
4     DEFERRABLE INITIALLY DEFERRED
5 );
6
7
8
9
10 BEGIN ISOLATION LEVEL
11 REPEATABLE READ;
12 INSERT INTO u VALUES (3);
13
14 INSERT INTO u VALUES (1);
15
16
17 UPDATE u SET b=5;
18 COMMIT;
19 SELECT count(*) FROM t;
```