Exercise: Transactions / Basics

1. With Activated Autocommit

Log in to MySQL and connect to a database where you have write privileges.
Do not change any settings. (This means, that AUTOCOMMIT is switched on, by default).

a)
Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "ROLLBACK" to the MySQL prompt.
Enter SELECT * FROM X; again to see whether the insertion was rolled back.
Why is the tuple still there?

b)
Type
START TRANSACTION;
to the MySQL prompt.

Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "ROLLBACK" to the MySQL prompt.
Enter SELECT * FROM X; again to see whether the insertion was rolled back.
Why is the tuple no longer there now?

2. With Autocommit switched off.

Type to the MySQL prompt:
SET AUTOCOMMIT = 0;

a)
Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "ROLLBACK" to the MySQL prompt.
Enter SELECT * FROM X; again to see whether the insertion was rolled back.
Why is the tuple no longer there? Compare this to situations 1a) and 1b).

b)
Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "COMMIT" to the MySQL prompt.
Enter SELECT * FROM X; again to verify that the tuple is still there.
Type "ROLLBACK" to the MySQL prompt.
Why is the tuple still there?

c)
Repeat 2a) and 2b) with a preceding START TRANSACTION; command.

3. Transactions consisting of several SQL statements

a)
Switch Autocommit off (=0) in case it is not switched off.

Enter several SQL statements that perform changes in the data.
After several statements, type COMMIT.

Verify that all changes are still in effect.

Enter several more SQL statements that perform changes in the data.
After several statements, type ROLLBACK.

Verify that all changes have been undone.

b)
Switch Autocommit on (= 1) in case it is not switched off.

Enter START TRANSACTION to the MySQL prompt.

Enter several SQL statements that perform changes in the data.
After several statements, type COMMIT.

Verify that all changes are still in effect.

Enter START TRANSACTION to the MySQL prompt.

Enter several more SQL statements that perform changes in the data.
After several statements, type ROLLBACK.

Verify that all changes have been undone.

Exercise: Transactions / Basics - Solutions

1. With Activated Autocommit

Log in to MySQL and connect to a database where you have write privileges.
Do not change any settings. (This means, that AUTOCOMMIT is switched on, by default).

a)
Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "ROLLBACK" to the MySQL prompt.
Enter SELECT * FROM X; again to see whether the insertion was rolled back.
Why is the tuple <u>still there</u>?

<u>**Answer**</u>: Because through the autocommit, the select statement was direckty committed. You cannot rollback a committed transaction by rollback, only by a new compensating transaction.

b)
Type
START TRANSACTION;
to the MySQL prompt.

Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "ROLLBACK" to the MySQL prompt.
Enter SELECT * FROM X; again to see whether the insertion was rolled back.
Why is the tuple <u>no longer there</u> now?

<u>**Answer**</u>: START TRANSACTION begins a new transaction without autocommit. Thus, the transaction can be rolled back by a ROLLBACK command as long as it has not been committed yet.

2. With Autocommit switched off.

Type to the MySQL prompt:
SET AUTOCOMMIT = 0;

a)
Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "ROLLBACK" to the MySQL prompt.
Enter SELECT * FROM X; again to see whether the insertion was rolled back.
Why is the tuple <u>no longer there</u>? Compare this to situations 1a) and 1b).

Answer:
If autocommit is switched off, any SQL command will start a new transaction. As long as this transaction has not been committed, it always may be rolled back by ROLLBACK. This is comparable to 1b).

b)
Insert a new tuple into a table X.
Enter SELECT * FROM X; to verify the tuple was inserted.
Type "COMMIT" to the MySQL prompt.
Enter SELECT * FROM X; again to verify that the tuple is still there.
Type "ROLLBACK" to the MySQL prompt.
Why is the tuple still there?

Answer:
The transaction has been committed. Thus it cannot be rolled back by ROLLBACK. A compensating transaction would be necessary for undoing the effect of this completed transaction.

c)
Repeat 2a) and 2b) with a preceding START TRANSACTION; command.

Answer:
The effect will be the same as in 2a) and 2b).

3. Transactions consisting of several SQL statements

a)
Switch Autocommit off (=0) in case it is not switched off.

Enter several SQL statements that perform changes in the data.
After several statements, type COMMIT.

Verify that all changes are still in effect.

Enter several more SQL statements that perform changes in the data.
After several statements, type ROLLBACK.

Verify that all changes have been undone.

b)
Switch Autocommit on (= 1) in case it is not switched off.

Enter START TRANSACTION to the MySQL prompt.

Enter several SQL statements that perform changes in the data.
After several statements, type COMMIT.

Verify that all changes are still in effect.

Enter START TRANSACTION to the MySQL prompt.

Enter several more SQL statements that perform changes in the data.
After several statements, type ROLLBACK.

Verify that all changes have been undone.