TRANSACTION

A transaction is the propagation of one or more changes to the database. For example, if you are creating a record or updating a record or deleting a record from the table, then you are performing a transaction on that table.

1)Show All students who's older than 20(USE COMMIT);

```
START TRANSACTION;
        SELECT * FROM Student
        WHERE Student.age > 20;
COMMIT;
```

2) Show the book by name Harry Potter and change it to 'Harry' ROLLBACK it than

```
START TRANSACTION;
        UPDATE Books SET Books.name = 'Harry' WHERE Books.name = 'Harry Potter'
LIMIT 1;
        SELECT * FROM Books WHERE Books.name = 'Harry';
ROLLBACK;
SELECT * FROM Books WHERE Books.name = 'Harry';
```

3) Add to Students 1 bonus points if they have 0; (ROLLBACK)

```
SELECT * FROM Grade WHERE bonus = 0;
START TRANSACTION;
        UPDATE Grade SET bonus = (bonus + 1) WHERE bonus = 0;
        SELECT * FROM Grade WHERE bonus = 0;
ROLLBACK;
SELECT * FROM Grade WHERE bonus = 0;
```

4) Create a Transaction that checks if there are any students with GPA 0 then delete him/her from the table.(USE ROLLBACK. OR if u really want to kick them from university than use COMMIT😁)

```
SELECT * FROM Student WHERE gpa = 0;
START TRANSACTION;
        DELETE FROM Student WHERE gpa = 0;
        SELECT * FROM Student WHERE gpa = 0;
ROLLBACK;
SELECT * FROM Student WHERE gpa = 0;
```

INDEXES

That we have too many tables and tuples, maybe sometimes it works too slow.
Indexes are used to retrieve data from the database more quickly than otherwise. The users cannot see the indexes, they are just used to speed up searches/queries.

1) Create index for student_id;

```
CREATE INDEX inx_Students ON Student(student_id);
SHOW indexes FROM Student;
SELECT student_id FROM Student USE INDEX(inx_Students);
```

2) Create index for book names and book genre;

```
SELECT * FROM Books;
CREATE INDEX inx_books ON Books(name, genre);
show indexes FROM Books;
SELECT name, genre FROM Books USE INDEX(inx_books);
```

3) Create index for student marks;

```
SELECT * FROM Grade;
CREATE INDEX inx_grade ON Grade(marks);
SHOW indexes FROM Grade;
SELECT marks FROM Grade USE INDEX(inx_grade);
```