Exercise: Triggers

a) Test the usage of triggers in MySQL with the following scenario:

Add a column to the table student with the name „gradeAverage”. The meaning of this value is the average of all grades that this student has achieved, and which are registered in the table Takes.

Then define the necessary triggers to keep this derived attribute consistent with the data in the table Takes, even when new grades are entered, grades are deleted, or grades are updated.

Hint:
After creating the new column „gradeAverage”, the values of this columns are all NULL. If you want to update them to the averages that follow from the existing tuples in the Takes table before executing the trigger for the first time, you can do it this way:

```
UPDATE Student s
SET gradeAverage =
(SELECT AVG(grade)FROM Takes WHERE s.matNr = Takes.matNr);
```

b) Just for fun:

Is it possible in MySQL to implement a trigger that removes a data record that has just been inserted into a given table? Give this trigger the name „virus”.

c) Set up an example where the firing of a trigger causes an event that fires a second trigger. Test it in MySQL. What would happen if there is a cycle, i.e. the firing of the first trigger causes a second trigger to fire which causes the first trigger to fire again, i.e. an endless loop?