Exercise 12

Advanced SQL 2: PSM

For this exercise sheet, please use the prepared SQL script `DB-Exercise10-KH-Testdata.sql` from the Community.

Task 1: Median

This task is about calculating the so-called median. The median separates a list of values into two halves. It can be determined in the following way: all values are sorted (in ascending order). If the number of values is odd, then the middle value is the median. If the number of values is even, the median is usually defined as the arithmetic mean of the two middle values, which are then called lower median and upper median.

a) Develop a function that calculates the median of all grades.
b) Expand the previously developed function so that it outputs the median for a given event. Use the function in a `SELECT` in such a way that it also outputs the deviation from the median for each grade of a student in an event.

Additional task:

Random data set with cursor and brain teaser without PSM

a) Use the following view, which generates a random number for you, to create a function that randomly returns a matriculation number from the database. You need this view because it is not possible to use the RAND function directly in a function. (see https://stackoverflow.com/questions/31468836/use-rand-in-user-defined-function)

```
CREATE VIEW vw_getRANDValue
AS
SELECT RAND() AS Value

select * from vw_getRANDValue
```

b) Try to find a randomly selected student only through a select, i.e. without the use of PSM and cursor. Note: to do so, you can cleverly combine the top function and the sorting.
c) Try to find the median only through a `Select`, i.e. without the use of PSM or variables.