Serie 7
Anfrageoptimierung 2007/08
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Formulate the following problems in *OttoVonG*:

1. Given:
INSTITUTE.xml: M(<u>INSTITUTE</u>, IMGR, IBUDGET, FBUDGET, DEAN, FACULTY)
a) INSTITUTE.xml is not in 3.NF. Do you can omit the redundancy in a query result!
b) Illustrate the 4 collection symbols (M, B, L, ?) with the help of a query on
    INSTITUTE.xml, which contains only the name FACULTY, explain the differences.
c) Find all faculties with corresponding institutes, which have a greater faculty budget than
    the sum of the corresponding budgets of the institutes. The total institutes and faculty
    budgets have to be computed additionally.

2. Given:
UNI.xml: UNIVERSI, M(FACULTY, DEAN, M(STUDENT), M(INSTITUTE)),
      typos(STUDENT) = (SSN, NAME, FIRSTNAME, SALARY, YEAR_OF_REG),
      typos(INSTITUTE) = (INSTITUT, LEADER,
            M(SSN, NAME, FIRSTNAME, SALARY, BIRTH_LOC))
a) Restructure and sort students by YEAR_OF_REG and FACULTY.
b) Sort students and employees alphabetically in <u>one</u> flat table.
c) Sort students and employees within <u>one</u> collection, such that later students and employees
    can be extracted.
d) Compute in one query with an ordinary target scheme all sums of SALARY, which may
    be represented in a cross table with dimensions M(FACULTY), M(YEAR_OF_REG).

3. Given:
CLASSBOOK.xml: M(NAME, FIRSTNAME, CLASS, SEX, M(SUBJECT, L(MARK)))
    a) Compute the averages per class and per (class, subject).
    b) Compute the averages to all combinations of CLASS, SUBJECT, an SEX.
    c) Find all pupils, who have only marks 1.
    d) Give for each mark all pupils, which have only this mark in maths.
    e) Give to each NAME of a pupil of class 1b the average in German.

4. Find an approximate for the first derivation and the integral of the sine function in the
    interval [1;10].

5. Compute the terms   3*6*9, 2*8+9*7, (3+4)*(8+9) und 3*6+3*7 in the "bar-list model"
    (Strichlistenmodell).