Serie 3
Anfragen an XML und Suchmaschinen 2007
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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 corrresponding 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:
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, how they are desired in school.
   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.

3. Given:
UNI.xml: UNIVERSI, M(FACULTY, DEAN, M(STUDENT), M(INSTITUTE))
STUDENT = (SSN, NAME, FIRSTNAME, SALARY, YEAR_OF_REG)
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).

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).