**Databases 1. Midterm Test Name:**

**Neptun code:**

Copy your solutions into one word or pdf file and send it to the following email address: [nikovits@inf.elte.hu](mailto:nikovits@inf.elte.hu). You should send the **results of the queries** too when it is mentioned!!!

**Exercise 1** (3x3 points)

**We have the following two relations: R(A,B,C) and S(C,D).** Rewrite the following relational algebra expressions into SQL. Run the SQL queries on the tables NIKOVITS.R and NIKOVITS.S in Ullman or Aramis database and give the results too. **Send the SQL and the result**.

a) γA,SUM(B) δ (ΠA,B R)

b) τSM ΠB,SM (σAV < 13 AND SM < 50(γB,AVG(D)->AV,SUM(D)->SM(R ⋈ S)))

c) γC,SUM(B) (σR.C=S.C R x (δ (ΠC S))

**Exercise 2** (5 points)

Based on relation **Likes(name, fruits)** express the following query in relational algebra, run the query in Relax and **send the query and the result**. (Use Relax\_Likes.txt to upload the data.)

List the **(name, fruit)** pairs where the name likes the fruit, and Kanga does not like this fruit.

**SQL queries**

The tables on which the SQL queries below are based are the following:

NIKOVITS.EMP (empno, ename, job, mgr, hiredate, sal, comm, deptno)

NIKOVITS.DEPT(deptno, dname, loc)

NIKOVITS.SAL\_CAT(category, lowest\_sal, highest\_sal)

For the following queries send the **SQL** and the **results of the query**. The columns of the result are in bracket. You can use ARAMIS or ULLMAN database.

**Exercise 3** (5 points)

Give the department names whose employees fall into 3 or more different salary categories. **(dname)**

**Exercise 4** (5 points)

Give the employees whose subordinates started to work in at least two different years. **(ename)** (That is, not all his subordinates started in the same year. Start of work -> HIREDATE)

**Exercise 5** (5 points)

Give the jobs where this job occurs only on one department, give the name of this department and the number of employees having this job. **(job, dname, num\_of\_emps)**

**Exercise 6** (5 points)

Give the salary category for which it is true that all the employees whose salary falls into this category, started to work in the same year. Give the category and this unique year.

**(category, year)**

**Exercise 7** (6 points)

Give the following result for which you can use the WITH statement. Give the employees for whom it is true that his salary is greater than the average salary of his department, and his salary is greater, than the average salary of his job. In the result give the employee’s name, his salary, the department average salary, and the job average salary.

**(ename, sal, dept\_avg, job\_avg)**