

Midterm Test Monday 16.00**Name:****Neptun code:**

Copy your solutions into one word or pdf file and send it to the following email address: 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) $\gamma_{A, \text{AVG}(C)} \delta (\Pi_{A,C} R)$

b) $\tau_{AV} \Pi_{SM, AV} (\sigma_{AV < 13 \text{ AND } SM < 50} (\gamma_{B, \text{AVG}(D) \rightarrow AV, \text{SUM}(D) \rightarrow SM} (R \bowtie S)))$

c) $\Pi_E (\gamma_{A, \text{SUM}(E) \rightarrow E} \Pi_{A, (B+C) \rightarrow E} R) \cup \delta (\Pi_C S)$

Exercise 2 (5 points)

Based on relation **Emp** express the following query in relational algebra, run the query in Relax and **send the query and the result**. (Use Relax_Emp_Dept.txt on my homepage to upload the data.)

List the (**job**, **deptno**) pairs where the job occurs on the department, but this job does not occur on department 10.

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 employees who have at least two subordinates who started to work on the same named day (e.g. Monday). Give the name of the employee (the boss), the name of the day, and the number of employees who started to work on that day. (**ename**, **day_name**, **num_of_emps**)

Exercise 4 (5 points)

Give the salary categories for which it is true that all the employees falling into this category started to work in the same year. Give the category and the year. (**category**, **year**)

Exercise 5 (5 points)

First create an EMP2 table which has the same content as table nikovits.emp. Then give an UPDATE statement which increases the salary of the employees whose salary is greater than the average salary of his own department. The increment is 1. After the UPDATE list the names and new salaries of the employees whose new salary ends at 1 or 6. (**Ename**, **Sal**)

Exercise 6 (6 points)

Give the following result for which you should use the WITH statement. Give the employees for whom it is true that his salary is less than the average salary of the employees falling into his salary category. In the result give the employee's name, his salary, and the average salary of his salary category. (**ename**, **sal**, **cat_avg**)