

# Query Optimization

## Exercise Sheet 1

due 24.10.2006

### Schema

Professors		Students		Exams			Attended	
PID	Name	SID	Name	LID	SID	Note	LID	SID
2156	Ranieri	6548	Feuerbach	0	6548	1.0	0	6548
5488	Zimmermann	9844	Petrov	12	9844	1.0	5	6548
5485	Autexier	8455	Weber	5	6548	1.3	5	8455
5420	Chiusi	1657	Lui	16	5448	2.7	0	8455
2088	Herberger	5448	Schumann	12	9844	3.4	16	5448
...		...		8	5448	1.7	12	9844
				22	9844	1.0	16	1657
				...			0	1657
							8	5448
							22	9844
							8	1657
							...	

Lectures		
LID	Name	givenBy
0	Programming Languages	5488
12	Banking	5485
5	Statistics	5420
16	Algorithms and Data Structures	5420
12	Algebraic Geometry	5420
8	Differential Geometry	5420
22	Scientific Writing	2088
...		

Table 1: DB Schema

## Exercise 1

(Points)

Use relational algebra to construct a plan (not necessary optimal) for each of the following queries. Present these plans as trees.

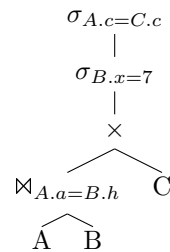
1. Find all lectures given by Prof. Chiusi. (1)
2. Give a list of students attending a lecture by Prof. Chiusi. (1)
3. Determine the average grade of each student from the result list from Ex 1.2. (1)
4. Find the best exam of each student. (1)
5. Find all students that attended all lectures by Prof. Chiusi. (1)

## Exercise 2

(Points)

Presented are algebraic expressions. Improve them. Give a short justification.

1. (2.5)



2. (2.5)

