Advanced Topics in Databases  
Exercise 10  
Summer Term 2012

1. Why does index tuning play a major role in database tuning? Make an educated guess and discuss your position.

2. Discuss the types of index structures. Which features are caused by the type and which are independent from the type?

3. Where can we use indexes and which drawbacks we have to calculate?

4. Discuss the differences between tuning and self-tuning. Use a self-chosen example to illustrate your opinion.

5. Perform the index-self-tuning process from lecture on the given example. The following informations are given:

   - Relationsize 2GB; 10 million tuples; 70 attributes
   - Primary key index is 250KB; Size of the index pool is 1MB
   - Name, first_name 2 million unique values
   - 1000 employees per city (index=100KB)
   - 0.1% of the employees earn more than 30.000 (index=350KB)
   - 2.000 employer per country (index=150KB);

Discuss how relevant the values are and where the values come from. Which additional information do you need to process? Discuss your opinion.

Additionally the following workload is given:

Q1: SELECT * FROM Relation;
Q2: SELECT name, first_name FROM Relation;
Q3: SELECT name, first_name FROM Relation WHERE city='Magdeburg';
Q4: SELECT name, first_name FROM Relation WHERE salary>30.000;
Q5: SELECT employer FROM Relation WHERE country='Germany';

6. We discussed index-self-tuning (physical design tuning) before, which other self-tuning approaches you can mention or imagine?

Good Luck!