Chair of applied computer science III
Prof. Dr. Guido Moerkotte
Email: moerkotte@uni-mannheim.de
UNIVERSITY OF MANNHEIM

Query Optimization — Exercise sheet 9

Exercise 1

Exercise 1 a)

Discuss how to compute the break-even point when choosing between a table scan and an index scan.

Exercise 1 b)

Let n be the number of pages needed for a relation. The time to access a page is $D_{pos} + D_{read}$. Where D_{pos} is the time to position the read/write head and D_{read} is the time it takes to read a page.

For the following numbers:

$$\begin{aligned} D_{pos} &= 5,0 \ \frac{\text{ms}}{\text{page}} \\ D_{read} &= 0,5 \ \frac{\text{ms}}{\text{page}} \\ n &= 110 \text{ pages} \end{aligned}$$

Compute the predicate selectivity s of the break-even point between random disk accesses and sequential disk accesses.

Exercise 2

Exercise 2 a)

Read about metaheuristics in computer science.
Wikipedia is your friend: `https://en.wikipedia.org/wiki/Metaheuristic`

Exercise 2 b)

Read the *Simulated Annealing* chapter in the script.

Exercise 2 c)

Implement `SimulatedAnnealing`. You may use the helper classes provided in the solution code.

Exercise 3

Exercise 3 a)

What is the expexted number of distinct balls drawn, when drawing k times from an urn with m balls with replacement.

Exercise 3 b)

Describe the yao formula.
Compute the yao formula for the values $N = 1000, m = 100, k = 15$