

Exercise „Analysis of Spatial Data“ WS 2010/2011 - Information Systems and Machine Learning Lab (ISMILL) - Prof. Dr. Alexandros Nanopoulos, Osman Akcatepe

Exercise sheet 4

Deadline: Dienstag, 24.01.2011 bis 23.59 Uhr

1. Range query: Give the SQL code for the construction of a spatial index in order to efficiently answer the question: “find all the codes of the block (Table Blocks) which are at less than 0.01 distance (function distance) from the geographical center of the entire county (Table County). Please provide the execution times with and without the use of spatial index, giving also the two corresponding SQL queries.

(Tip: it may be better to find the center of the county separately and use its coordinates inside the SQL query. The Execution time is displayed in the window tab titled Messages inside the window where you execute the SQL queries.)

2. Intersection spatial join: Give the SQL code for building those additional (in relation to the Question 1) spatial indexes in order to efficiently answer the question: “find all pairs of block codes (Table Blocks) and railway parts (Table Rails), which are intersected with each other (operator intersect). Please provide the execution times with and without the use of spatial lists, giving also the two corresponding SQL queries.

3. Containment spatial join: Use the spatial indexes that you developed previously (in Questions 1 and 2) in order to efficiently answer the question: “find all pairs of block codes (Table Blocks) and railway parts (Table Rails) that are owned (column fename) by the Pacific Electric Railway, where each rail part is contained entirely within the respective block. Please provide the execution times with and without the use of spatial indexes, giving also the two corresponding SQL queries.

4. Directional spatial join: Use the spatial indexes that you developed previously (in Questions 1 and 2) in order to efficiently answer the question: “find all the codes of the block (Table Blocks) whose center is on the left side of the center of the block whose code is equal to 22499. Please provide the execution times with and without the use of spatial indexes, giving also the two corresponding SQL queries.