

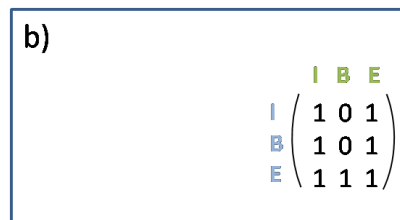
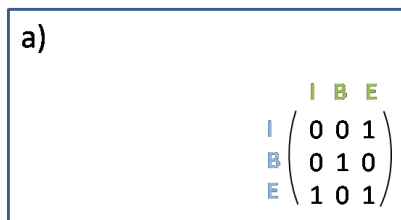
## Exercises for Spatial Databases and GIS

### Sheet I (until 02.11.2012)

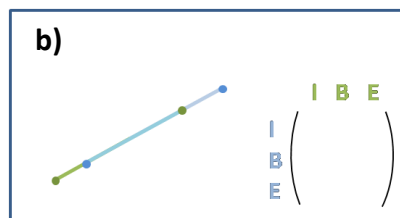
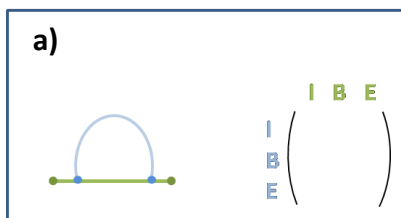
#### Exercise 1 (9-intersection model)

A simple line is a line with exactly two endpoints and any connection between them, e.g. straight line, arc, ogee, etc. A simple polygon is one polygon without any holes.

1. Draw any possible combination of two geometries (point, simple line, simple polygon) to exemplify the given 9-intersection matrices.



2. Write down the matrices for the topological relations between the drawn lines.



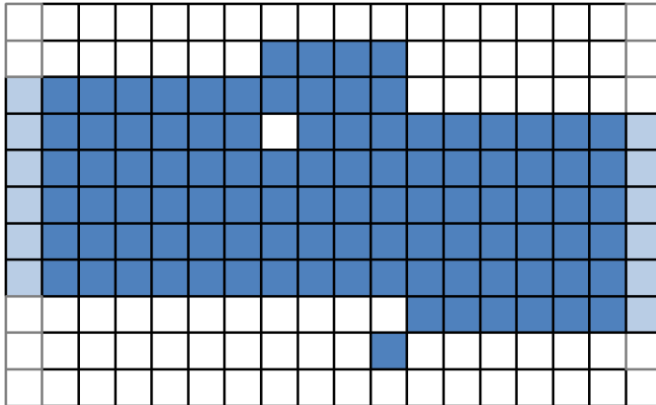
3. Draw all topological relations that are possible between a point and a simple line and write down their corresponding matrices.
4. Why are there more different topological relations between simple lines (33 altogether) than between polygons (only 8)?

#### Exercise 2 (Outline extraction)

Formulate the algorithm for the outline extraction of polygons described on slide 110 in pseudo code.

### Exercise 3 (Centerline extraction)

1. Vectorize the dark blue part of the given line using topological thinning.



2. If holes and stubbles consisting of only a few pixels are most probably faults, what could be used as preprocessing step to eliminate them?

Insignificant pixel:

