

One-Stop GIS

Other Editing Operations (Edge Matching, Line Smoothing, and Line Simplification) That Cannot be Classified as Either Topological or Non-Topological (Especially for GATE-Geospatial 2022)

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There are editing operations that cannot be easily classified as either topological editing or nontopological editing. It covers two such operations:

Editing Operations

- Edgematching
- Line Simplification and Smoothing

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Edge-Matching

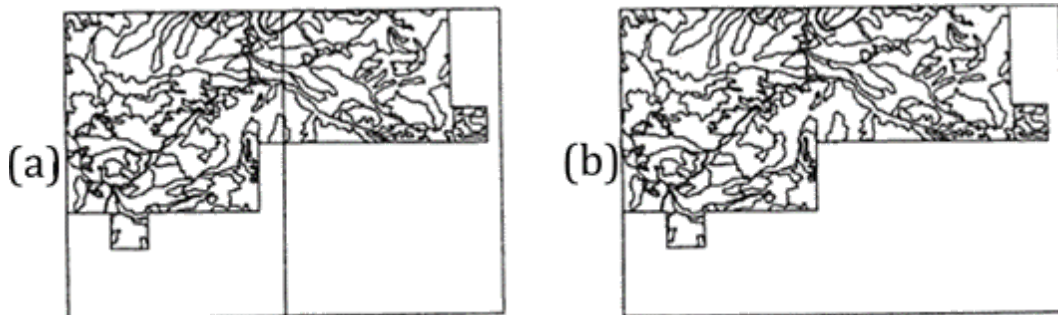
Edge-matching matches lines along the edge of a layer to lines of an adjacent layer so that the lines are continuous across the border between the layers. For example, Edge-matching is required for constructing.

Edge-matching is the process of joining two or more map sheets. At the map sheet edges, feature representations must be matched to be combined. There are two sources of difficulty in this:

- Two maps that were input with same projection but because they were put in separately are likely to display entity errors that are somewhat different.
- Therefore, although each map may be accurate with respect to itself, the differences in input map may be reasonably accurate with respect to itself, the differences in input

errors between the two will most likely cause mismatch.

- The solution is, you will need to link all the line and polygon entities that are supposed to be connected.
- The second situation is when two maps are from different projections.



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Edge-matching matches the lines of two adjacent layers (a) so that the lines are continuous across the border (b) .



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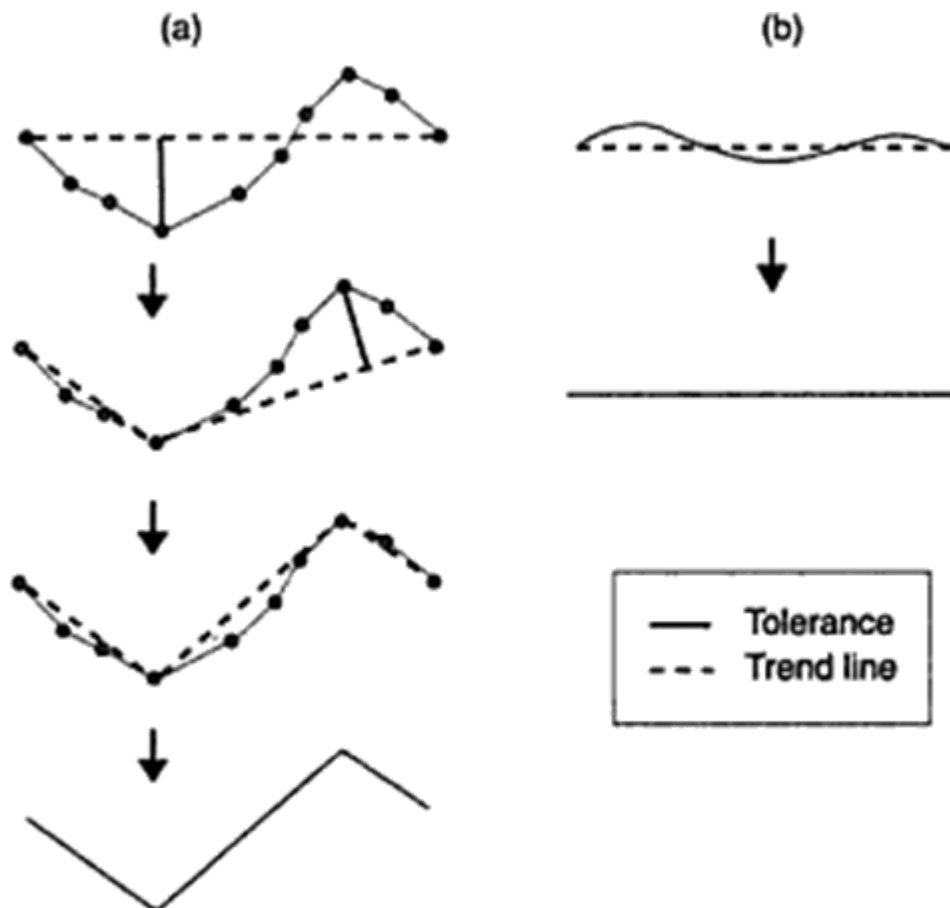
Mismatches of lines from two adjacent layers are only visible after zooming in.

Line simplification

Line simplification refers to the process of simplifying or generalizing a line by removing some of its points. When a map digitized from the 1 : 100,000 scale source map is

displayed at the 1 : 1,000,000 scale, lines become jumbled and fuzzy because of the reduced map space.

The Douglas-Peucker algorithm is a well-known algorithm for line simplification. The algorithm starts by connecting the end points of a line with the trend line. The deviation of each intermediate point from the trend line is calculated.



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The Douglas-Peucker line simplification algorithm is an iterative process that requires the use of a tolerance, trend lines, and the calculation of deviations of vertices from the trend lines.

By emphasizing the shape of a line, this new algorithm tends to produce simplified lines with better cartographic quality than does the Douglas-Peucker algorithm.

Line smoothing

Line smoothing refers to the process of reshaping lines by using some mathematical functions such as splines.

Lines derived from computer processing such as isolines on a precipitation map are sometimes jagged and unappealing. These lines can be smoothed for data display purposes.



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Line smoothing smoothes a line by generating new vertices mathematically and add them to the line. Above figure shows an example of line smoothing using splines.

Developed by: [Mindsprite Solutions](#)