Vector Processing

Site: TMT Bangladesh
Course: Introduction to Scientific Programming
Book: Vector Processing

Printed by: Mustafa Kamal Shahadat
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Description

Vector

Table of contents

1. Vector-based processing libraries

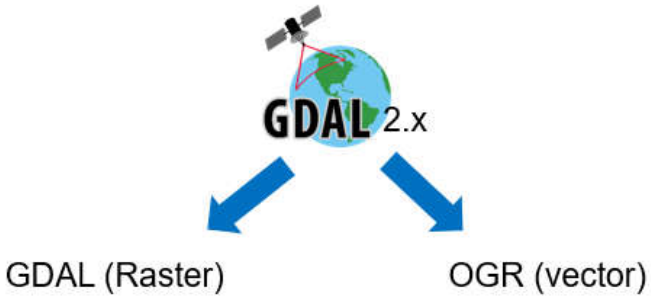
There are several vector processing libraries

- Java Topology Suite (Java)
- .Net Topology Suite
- GeoTools (Java)
- GEOS (C++)
- Fiona (Python)
- Shapely (Python)
- OGR (C/C++/Python APIs)

OGR is one of the most powerful libraries, available for for vector processing.

2. GDAL and OGR

OGR is part of GDAL library



3. What file formats?

OGR support working with several well-known GIS

- Shapefile
- GeoPackage
- PostgreSQL/PostGIS
- Coverage
- Geodatabase
- MapInfo
- TIGER
- KML
- KMZ

... and several more GIS formats.

4. Using OGR in a classical vector processing workflow

OGR can be used in a classical vector processing workflow.
Such a workflow may include the following steps:

- Open a vector dataset
  - Shapefile
  - Database on a DBMS
  - Web server, e.g., WFS
  - ...
- Access dataset properties
  - Metadata
  - Iterate over layers
- Access layers
  - Projection
  - Extents
  - Information about the attribute table: Number of fields, field names, etc.
  - Apply filters
- Access features
  - Get fields data
  - Get geometry
- Process geometry/geometries
  - Preprocessing: change projection, generalization, etc.
  - Query: Spatial Query, Attribute Query
  - Unary operations: Buffer,
  - Binary operations: intersect, overlay, etc.
  - Proximity analysis
  - ...
- Save a new dataset
  - Save
  - Save as ...
  - Convert

5. Presentation & Exercise

Recorded Lecture

- Vector Processing

Presentations:

- Slides: SL_ISC_11_vector_processing

Exercise:

- Exercise_ISC_P11_Vector
- Exercise_ISC_P11_Vector_Data

6. Further readings

Readings

- Python GDAL/OGR Cookbook!