Raster Processing

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

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1. What is gdal?

The Geospatial Data Abstraction Library

GDAL is a library for raster and vector geospatial data formats, licensed by the Open Source Geospatial Foundation (OSGeo).

The library is composed of two separate parts:

- GDAL: for raster processing
- OGR: for vector processing

Also, it is available for several programming languages, including Python, C, C++, and Java.

2. gdal and Open-source GIS Software

gdal has been used by many open-source GIS software packages.

E.g.:

3. Contents of the gdal library

After the installation of gdal, we will have access to the following modules in Python:

gdal : classes for reading/modifying/saving raster data

ogr : classes for reading/modifying/saving vector data

osr : classes to work with spatial references and coordinate transformations

gdalconst : constants to use as arguments of methods

gdal_array : functions for

- importing raster into numpy arrays and
- exporting numpy arrays to rasters

4. Using gdal in a classical raster workflow

gdal can be used in a classical raster workflow.
Such a workflow may include the following steps:

- Open a raster dataset
  - Access dataset properties:
  - Dataset type or driver's name
  - Metadata
  - Size
  - Projection and geotransform coefficients
- Access one or more bands:
  - Statistics
  - Extract pixel values
  - Extract a subset
  - Convert into an array format, e.g., a numpy array
  - Convert from an array format (e.g., numpy) to gdal
- Save a gdal dataset into the disk

5. Presentation & Exercise

Recorded Lecture:

- Raster Processing

Presentations

- SL_ISC_10_raster_processing

Exercises:

- Exercise_ISC_P10_Raster_Processing
- Exercise_ISC_P10_Raster_Processing_Data

6. Answer

Answer:

- Answer_ISC_P10_Raster_Processing

7. Further readings

To extend your knowledge about GDAL and raster processing, you can use the following online resources.

- Python GDAL/OGR Cookbook!
- GDAL Raster API Tutorial
- GDAL Python Documentation