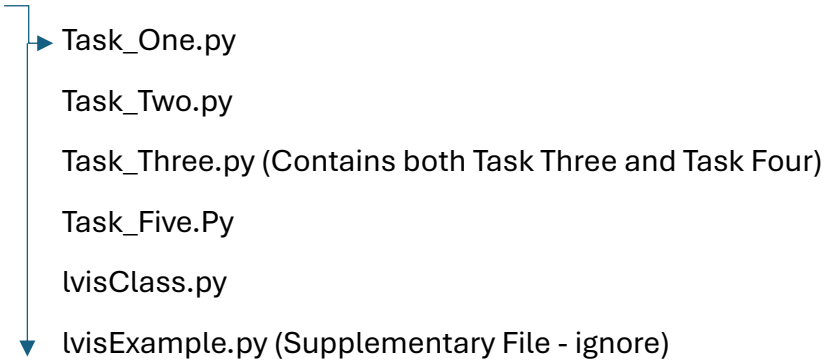
README

The overall aim of this assignment is to create DEM's, otherwise known as Geotiffs, of the LVIS Satellite Data to show the change in Pine Island Glacier elevation. Task One reads a LVIS Satellite File and plots a graph of a waveform, examining the intensity and elevation. Task Two takes the LVIS file and creates a DEM. Task Three processes the 2015 data into a DEM, while Task Four 'gap fills' these flight lines to show average elevation, also processing the 2009 data. Finally, Task Five reports the change in ice volume and creates a DEM showing elevation change between 2009 and 2015. All tasks use argument parsing to avoid hard coding filenames or file paths.

Once this file is downloaded, the commands should run successfully once you are within the folder location (/path/hdf).

File Structure

hdf



Source LVIS File Locations

/geos/netdata/oosa/assignment/lvis/2009/
/geos/netdata/oosa/assignment/lvis/2015/

Commands

Task One

Command: Python 'Task_One.py' /Path to LVIS File/ --index (chosen index number)

Example: python 'Task_One.py'
'/geos/netdata/oosa/assignment/lvis/2009/ILVIS1B_AQ2009_1020_R1408_052195.h5' --index 2000

Task Two

Command: Python 'Task_Two.py' /Path to LVIS File/ resolution output file name

Example: python 'Task_Two.py'
/geos/netdata/oosa/assignment/lvis/2009/ILVIS1B_AQ2009_1020_R1408_052195.h5 30
output_dem.tif

Task Three

Process Files:

Python Task_Three.py process_files –input_dir /path to input directory/ --scratch_dir /path to output directory/

Example: Python Task_Three.py process_files --input_dir /geos/netdata/oosa/assignment/lvis/2015/ --scratch_dir /home/username /scratch/

Merge Files:

Python Task_Three.py merge –scratch_dir /path to input directory/ --output_tif /path to output directory/ --year (year: 2009 or 2015).

Example: python Task_Three merge --scratch_dir /home/username/scratch --output_tif /home/username/2015merged.vrt --year 2015

Reproject Files:

Python Task_Three.py reproject –src_path /path to input file (merged tif)/ --dest_path /output path/ --year (year: 2009 or 2015)

Example: Python Task_Three.py reproject --src_path /home/username/2015merged.vrt --dest_path /home/username/reprojected_output2015.tif --year (year: 2009 or 2015)

Task Four

Python Task_Three.py fill_gaps --in_path /input path to reprojected tif/ --out_path /output path/ --year (year:2009 or 2015).

Python Task_Three.py fill_gaps --in_path /home/username/reprojected_output2015.tif --out_path /home/username/filled_output2015.tif --year 2015

Task Five

Python Task_Five.py path/to/2015.tif path/to/2009.tif path/to/output_file.tif