

Practical Session: 4 Exercise – GPT (Graph processing Tool)

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Satellite Applications Catapult - Electron Building, Harwell, Oxfordshire

GPT (Graph processing Tool)

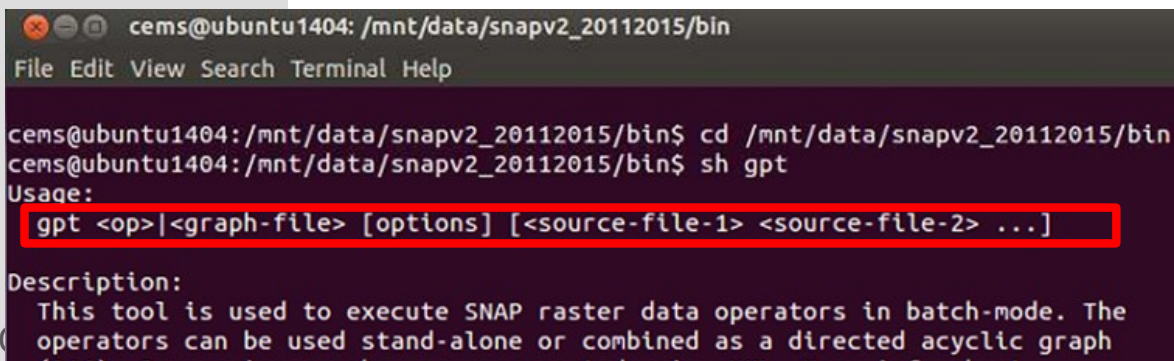
GPT (Graph processing Tool) is used to execute SNAP raster data operators in batch-mode

- Operators can be used as standing alone
- Operators combined as a (direct acyclic) **processing graph**, represented using **XML**

GPT engine located in: `./snap_directory_installation/bin`

e.g.: `/mnt/data/snapv2_20112015/bin`

How to launch the gpt engine : `/mnt/data/snapv2_20112015/bin/gpt.sh`



```
cems@ubuntu1404: /mnt/data/snapv2_20112015/bin
File Edit View Search Terminal Help

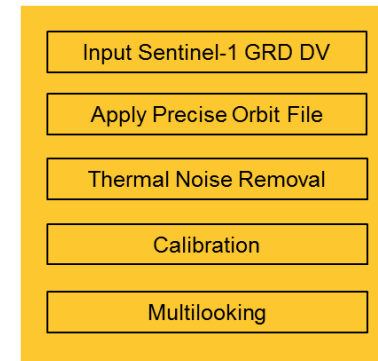
cems@ubuntu1404:/mnt/data/snapv2_20112015/bin$ cd /mnt/data/snapv2_20112015/bin
cems@ubuntu1404:/mnt/data/snapv2_20112015/bin$ sh gpt
Usage:
  gpt <op>|<graph-file> [options] [<source-file-1> <source-file-2> ...]

Description:
  This tool is used to execute SNAP raster data operators in batch-mode. The
  operators can be used stand-alone or combined as a directed acyclic graph
  (DAG). The operators are executed in the order specified in the XML file.
```

Processing graph

In Exercise 2, we have created a processing graph by using the Graph builder “batchgraph.xml” implementing this processing

- Open “batchgraph.xml” located in the folder
/mnt/data/Exercise2-TimeSeries/Output
with a text editor:



To execute the batchgraph.xml (change the line 71 file output name)

➡ `/mnt/data/snapv2_20112015/bin/gpt /mnt/data/Exercise2-TimeSeries/Output/batchgraph.xml`


Processing graph

The graph "batchgraph.xml" contains "static" parameters (input name, output name, operators parameters)

Variables



Dynamic parameters

- 
- Open "batchgraph.xml" located in the folder below with a text editor:
/mnt/data/Exercise2-TimeSeries/Output

Replace

line 7

<file>/mnt/data/Exercise2-TimeSeries/Dataset/S1A_IW_GRDH_1SDV_20150511T175713_20150511T175738_005877_007913_DEA8.SAFE/manifest.safe</file>

with:

<file>\$input1</file>

Processing graph

Line 59 and 60

`<nRgLooks>3</nRgLooks>`

`<nAzLooks>3</nAzLooks>`

with

`<nRgLooks>$input2</nRgLooks>`

`<nAzLooks>$input3</nAzLooks>`

Line 71

`<file>/mnt/data/Exercise2-TimeSeries/Output/S1A_IW_GRDH_TEST.dim</file>`

with

`<file>$target1</file>`

Processing graph

Save the “batchgraph.xml” with another name “batchgraph_modified.xml”

To execute the batchgraph_modified.xml

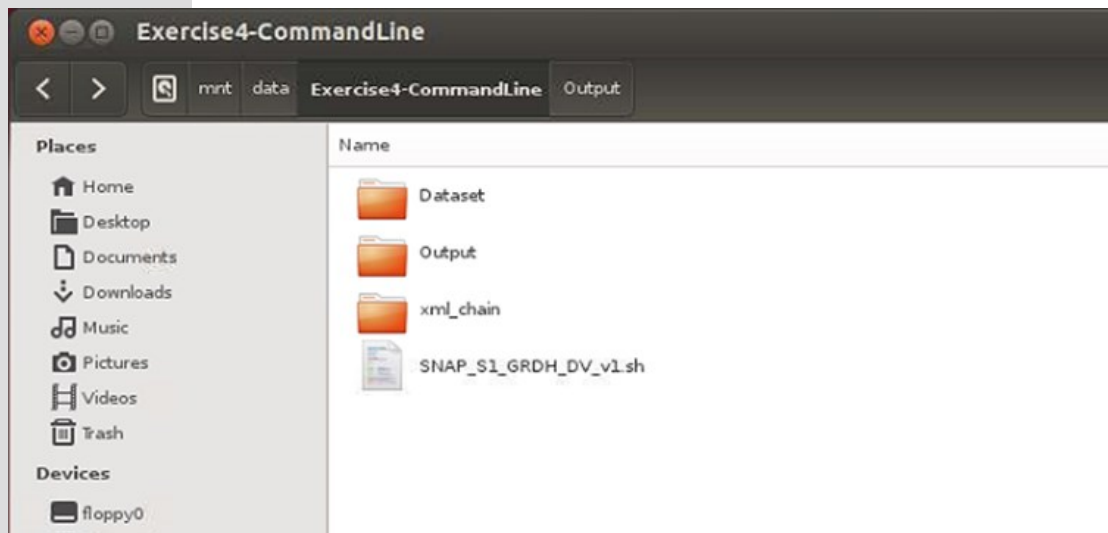
```
/mnt/data/snapv2_20112015/bin/gpt /mnt/data/Exercise4-CommandLine/BatchGraph_modified.xml\  
-Pinput1="/mnt/data/Exercise2-  
TimeSeries/Dataset/S1A_IW_GRDH_1SDV_20150511T175713_20150511T175738_005877_007913_DEA8.  
SAFE/manifest.safe" -Pinput2="5" -Pinput3="5\  
-Ptarget1="/mnt/data/Exercise4-CommandLine/Output/S1A_IW_GRDH_newproc.dim"
```

Bash Linux script

/mnt/data/Exercise4-CommandLine/

Linux bash script: SNAP_S1_GRDH_DV_v1.sh

Variables  Dynamic parameters



Bash Linux script

Dataset folder containing the input for the script

The outputs of the script will be stored here

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| Name | Size | Type | Modified |
|-----------|---------|--------|----------|
| Dataset | 2 items | Folder | 00:23 |
| Output | 3 items | Folder | 00:00 |
| xml_chain | 4 items | Folder | 00:15 |

| Name |
|---|
| S1A_IW_GRDH_1SDV_20150511T175713_20150511T175738_0058 |
| S1A_IW_GRDH_1SDV_20150523T175713_20150523T175738_0060 |

| Name |
|--|
| SNAPv2_Orbit_BorderRemoval.xml |
| SNAPv2_RD_TerrainCorrectionSRM90_WGS84LL.xml |
| SNAPv2_Subset_SpeedieFile_ConvToDb_geotiff.xml |
| SNAPv2_ThermalNoiseRem_ML_Cal.xml |

Bash Linux script

The script implements a processing from single Sentinel-1 IW GRDH SDV (VV-VH) to get a calibrated (respect to Ellipsoid), Orthorectified, despeckled Sigma0 VV and VH, Gamma0 VV and VH images by using a SRTM 90 DEM.

For each SENTINEL-1 GRDH DUAL_POL product in

Processing applied:

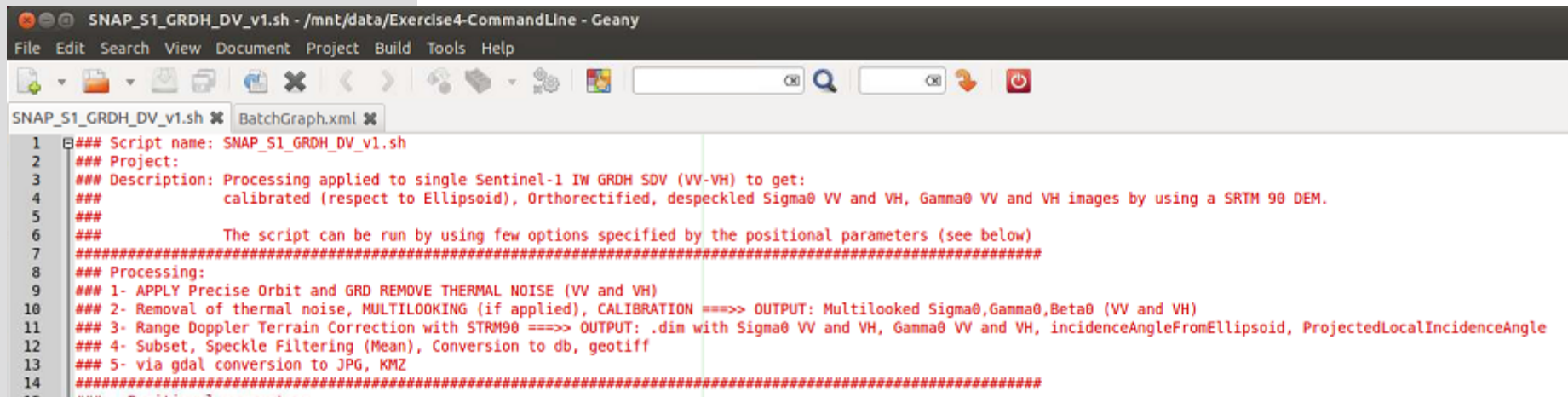
- 1- APPLY Precise Orbit and GRD REMOVE THERMAL NOISE (VV and VH)
- 2- Removal of thermal noise, MULTILOOKING (optional), CALIBRATION
→ OUTPUT: Multilooked Sigma0, Gamma0, Beta0 (VV and VH)
- 3- Range Doppler Terrain Correction with STRM90
→ OUTPUT: Sigma0 VV and VH, Gamma0 VV and VH (Inc.AngleFromEllipsoid, ProjectedLocalInc.Angle)
- 4- Subset (optional), Speckle Filtering (Mean), Conversion to db, geotiff (format)
- 5- via gdal conversion to JPG, KMZ



Bash Linux script

- Open “SNAP_S1_GRDH_DV_v1.sh” located in the below folder with a text editor:

/mnt/data/Exercise4-CommandLine/



```

1  ### Script name: SNAP_S1_GRDH_DV_v1.sh
2  ### Project:
3  ### Description: Processing applied to single Sentinel-1 IW GRDH SDV (VV-VH) to get:
4  ###               calibrated (respect to Ellipsoid), Orthorectified, despeckled Sigma0 VV and VH, Gamma0 VV and VH images by using a SRTM 90 DEM.
5  ###
6  ###               The script can be run by using few options specified by the positional parameters (see below)
7  #####
8  ### Processing:
9  ### 1- APPLY Precise Orbit and GRD REMOVE THERMAL NOISE (VV and VH)
10 ### 2- Removal of thermal noise, MULTILOOKING (if applied), CALIBRATION ==>> OUTPUT: Multilooked Sigma0,Gamma0,Beta0 (VV and VH)
11 ### 3- Range Doppler Terrain Correction with STRM90 ==>> OUTPUT: .dim with Sigma0 VV and VH, Gamma0 VV and VH, incidenceAngleFromEllipsoid, ProjectedLocalIncidenceAngle
12 ### 4- Subset, Speckle Filtering (Mean), Conversion to db, geotiff
13 ### 5- via gdal conversion to JPG, KMZ
14 #####

```

To execute the script:

```
sh /mnt/data/Exercise4-CommandLine/SNAP_S1_GRDH_DV_v1.sh 0 5 1
```

Any Question?

