File Edit Selection View Go Run Terminal Help ASSIGNMENT_BGE033.ipynb - python class - Visual Studio Code

EXPLORER

PYTHON CLASS
- asssignment.ipynb
- practise.py
- python_class1.py
- SauravSir_codes.py
- tempCodeRunnerFile....
- test.py

OUTLINE
- Q1: Reading and...
- Reading: Obtai...
- Reading: indivi...
- Computing the...

TIMELINE

test.py | ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > Q1: Reading and Computing statistics of a Raster Image > Reading: individual information

+ Code + Markdown | Run All | Clear Outputs of All Cells | Restart | Interrupt | Variables | Outline ... | myenv (Python 3.8.13)

Q1: Reading and Computing statistics of a Raster Image

[1]
```
from osgeo import gdal
```
Python

[4]
```
import os
os.chdir(r"E:\PYTHON-ASSIGNMENT")
```
Python

[103]
```
ds=gdal.Open('LC08_L1TP_142040_20211217_20211223_01_T1_B1.tif')
print(ds)
```
Python

```
<osgeo.gdal.Dataset; proxy of <Swig Object of type 'GDALDatasetShadow *' at 0x000001643F40B150> >
```

Reading: Obtaining all information

[1]
```
# Obtaining the information of the raster image of intrest at once

!gdalinfo LC08_L1TP_142040_20211217_20211223_01_T1_B1.tif
```
✓ 0.6s Python

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

PS C:\Users\DELL\Desktop\python class>

powershell
Code

0 0 | Jupyter Server: Local | Cell 7 of 16 | Go Live

Type here to search 72°F Cloudy ENG US 8:06 PM 8/23/2022

File Edit Selection View Go Run Terminal Help — ASSIGNMENT_BGE033.ipynb - python class - Visual Studio Code

EXPLORER

PYTHON CLASS
- asssignment.ipynb
- practise.py
- python_class1.py
- SauravSir_codes.py
- tempCodeRunnerFile....
- test.py

OUTLINE
- Q1: Reading and...
  - Reading: Obtai...
  - Reading: indivi...
  - Computing the...

TIMELINE

test.py | ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > Q1: Reading and Computing statistics of a Raster Image > Reading: individual information

+ Code + Markdown | Run All | Clear Outputs of All Cells | Restart | Interrupt | Variables | Outline ... | myenv (Python 3.8.13)

Reading: Obtaining all information

```
# Obtaining the information of the raster image of intrest at once

!gdalinfo LC08_L1TP_142040_20211217_20211223_01_T1_B1.tif
```

[1] ✓ 0.6s Python

```
ERROR 4: LC08_L1TP_142040_20211217_20211223_01_T1_B1.tif: No such file or directory
gdalinfo failed - unable to open 'LC08_L1TP_142040_20211217_20211223_01_T1_B1.tif'.
```

Reading: individual information

```
#getting X and Y size of the Raster
ds.RasterXSize,ds.RasterYSize
```

[68] Python

```
(7781, 7921)
```

```
#getting projection info of the image
ds.GetProjection()
```

[49] Python

```
'PROJCS["WGS 84 / UTM zone 45N",GEOGCS["WGS 84",DATUM["WGS_1984",SPHEROID["WGS
84",6378137,298.257223563,AUTHORITY["EPSG","7030"]],AUTHORITY["EPSG","6326"]],PRIMEM["Greenwich",0,AUTHORITY["EPSG","8901"]],UNIT["degree",0.0174532925199433,AUT
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

PS C:\Users\DELL\Desktop\python class>

powershell
Code

⊗ 0 ⚠ 0 — Jupyter Server: Local — Cell 7 of 16 — Go Live

Type here to search — 72°F Cloudy — ENG US — 8:06 PM 8/23/2022

File Edit Selection View Go Run Terminal Help — ASSIGNMENT_BGE033.ipynb - python class - Visual Studio Code

EXPLORER

PYTHON CLASS
- asssignment.ipynb
- practise.py
- python_class1.py
- SauravSir_codes.py
- tempCodeRunnerFile....
- test.py

OUTLINE
- Q1: Reading and...
  - Reading: Obtai...
  - Reading: indivi...
  - Computing the...

TIMELINE

test.py | ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > Q1: Reading and Computing statistics of a Raster Image > Reading: individual information

+ Code + Markdown | Run All | Clear Outputs of All Cells | Restart | Interrupt | Variables | Outline ... | myenv (Python 3.8.13)

Reading: individual information

[68]
```
#getting X and Y size of the Raster
ds.RasterXSize,ds.RasterYSize
```
Python

```
(7781, 7921)
```

[49]
```
#getting projection info of the image
ds.GetProjection()
```
Python

```
'PROJCS["WGS 84 / UTM zone 45N",GEOGCS["WGS 84",DATUM["WGS_1984",SPHEROID["WGS
84",6378137,298.257223563,AUTHORITY["EPSG","7030"]],AUTHORITY["EPSG","6326"]],PRIMEM["Greenwich",0,AUTHORITY["EPSG","8901"]],UNIT["degree",0.0174532925199433,AUT
HORITY["EPSG","9122"]],AUTHORITY["EPSG","4326"]],PROJECTION["Transverse_Mercator"],PARAMETER["latitude_of_origin",0],PARAMETER["central_meridian",87],PARAMETER["
scale_factor",0.9996],PARAMETER["false_easting",500000],PARAMETER["false_northing",0],UNIT["metre",1,AUTHORITY["EPSG","9001"]],AXIS["Easting",EAST],AXIS["Northin
g",NORTH],AUTHORITY["EPSG","32645"]]'
```

[91]
```
#Obtaining the transformation parameters
ds.GetGeoTransform()
```
Python

```
(100185.0, 30.0, 0.0, 3315315.0, 0.0, -30.0)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

```
PS C:\Users\DELL\Desktop\python class>
```

powershell
Code

0 ⚠ 0 — Jupyter Server: Local — Cell 7 of 16 — Go Live

Type here to search — 72°F Cloudy — ENG US — 8:06 PM 8/23/2022

File Edit Selection View Go Run Terminal Help — ASSIGNMENT_BGE033.ipynb - python class - Visual Studio Code

EXPLORER

PYTHON CLASS
- asssignment.ipynb
- practise.py
- python_class1.py
- SauravSir_codes.py
- tempCodeRunnerFile....
- test.py

OUTLINE
- Q1: Reading and...
  - Reading: Obtai...
  - Reading: indivi...
  - Computing the...

TIMELINE

test.py | ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > Q1: Reading and Computing statistics of a Raster Image > Reading: individual information

+ Code + Markdown | Run All | Clear Outputs of All Cells | Restart | Interrupt | Variables | Outline ... | myenv (Python 3.8.13)

```
[90]
#getting height and width info of the image

source_geotransform = ds.GetGeoTransform()
source_width = source_geotransform[1]
source_height = source_geotransform[5]
source_width,source_height
```
Python

```
(100185.0, 30.0, 0.0, 3315315.0, 0.0, -30.0)
```

```
[92]
#obtaining the number of bands in raster image
ds.RasterCount
```
Python

```
1
```

```
[96]
#obtaining band information in array format
band = ds.GetRasterBand(1)
data = band.ReadAsArray()
data
```
Python

```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

```
PS C:\Users\DELL\Desktop\python class>
```

powershell
Code

0 ⚠ 0 — Jupyter Server: Local — Cell 7 of 16 — Go Live

Type here to search — 72°F Cloudy — ENG US — 8:07 PM 8/23/2022

File Edit Selection View Go Run Terminal Help ASSIGNMENT_BGE033.ipynb - python class - Visual Studio Code

EXPLORER

PYTHON CLASS
- asssignment.ipynb
- practise.py
- python_class1.py
- SauravSir_codes.py
- tempCodeRunnerFile....
- test.py

OUTLINE
- Q1: Reading and...
  - Reading: Obtai...
  - Reading: indivi...
  - Interactive visu...
  - Computing the...
  - empty cell

TIMELINE

test.py | ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > Q1: Reading and Computing statistics of a Raster Image > #Using matplotlib for interactive visualization

+ Code + Markdown | Run All | Clear Outputs of All Cells | Restart | Interrupt | Variables | Outline ... myenv (Python 3.8.13)

```
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint16)
```

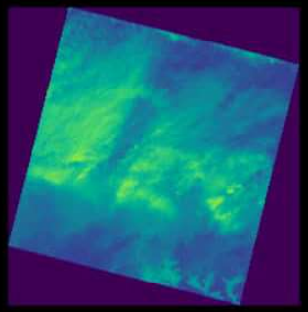
Interactive visualization

```
#Using matplotlib for interactive visualization

import matplotlib.pyplot as plt
plt.imshow(data,cmap='viridis')
#commonly used cmap are inferno,magma,plasma, viridis
```

[102] Python

```
<matplotlib.image.AxesImage at 0x164496c1460>
```



+ Code + Markdown

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

```
PS C:\Users\DELL\Desktop\python class>
```

powershell
Code

0 0 | Jupyter Server: Local | Cell 15 of 18 | Go Live

Type here to search 72°F Cloudy ENG US 8:11 PM 8/23/2022

File Edit Selection View Go Run Terminal Help ASSIGNMENT_BGE033.ipynb - python class - Visual Studio Code

EXPLORER

PYTHON CLASS
- asssignment.ipynb
- practise.py
- python_class1.py
- SauravSir_codes.py
- tempCodeRunnerFile....
- test.py

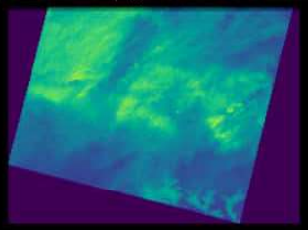
OUTLINE
- Q1: Reading and...
  - Reading: Obtai...
  - Reading: indivi...
  - Interactive visu...
  - Computing the...
  - empty cell

TIMELINE

test.py | practise.py | ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > Q1: Reading and Computing statistics of a Raster Image > #Using matplotlib for interactive visualization

+ Code + Markdown | Run All | Clear Outputs of All Cells | Restart | Interrupt | Variables | Outline ... myenv (Python 3.8.13)



Computing the statistics of a raster data

```
[108]
#[min,max,mean and SD]

band.ComputeStatistics(False)
```
Python

```
[0.0, 37973.0, 11479.474310600368, 9259.5926256751]
```

Markdown

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

```
dict_items([('name', 'mycompany'), ('headquater', 'silicon valley'), ('year', 2007)])
name mycompany
headquater silicon valley
year 2007
PS C:\Users\DELL\Desktop\python class>
```

powershell
Code
Code
Python
Code

0 0 Jupyter Server: Local Cell 15 of 18 Go Live

Type here to search 72°F Cloudy ENG US 8:17 PM 8/23/2022

File Edit Selection View Go Run Terminal Help ASSIGNMENT_BGE033.ipynb - Visual Studio Code

ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > M↓Q2.Perform layerstacking and mosaicing lab

+ Code + Markdown | Run All Clear Outputs of All Cells Restart Interrupt | Variables Outline ··· myenv (Python 3.8.13)

Q2.Perform layerstacking and mosaicing lab

```
# opeanin 3 raster files to stack

files = ['LC08_L1TP_142040_20211217_20211223_01_T1_B1.tif','LC08_L1TP_142040_20211217_20211223_01_T1_B2.tif','LC08_L1TP_142040_20211217_20211223_01_T1_B3.tif']
```

[17] ✓ 0.9s Python

```
data_list = list()
for i in files:
    ds = gdal.Open(i)
    data_list.append(ds)

print(ds)
```

[18] ✓ 0.1s Python

```
<osgeo.gdal.Dataset; proxy of <Swig Object of type 'GDALDatasetShadow *' at 0x000001DBB8B47B70> >
```

```
#creating a driver
driver = gdal.GetDriverByName('GTIFF')
driver
```

[19] ✓ 0.1s Python

```
<osgeo.gdal.Driver; proxy of <Swig Object of type 'GDALDriverShadow *' at 0x000001DBD198BD20> >
```

```
# Creating a blank 3bands file
out_ds = driver.Create('compositefinal.tif',data_list[0].GetRasterBand(1).XSize,data_list[0].GetRasterBand(1).YSize,3,data_list[0].GetRasterBand(1).DataType)
```

[20] ✓ 0.1s Python

⊗ 0 ⚠ 2 Jupyter Server: Local Cell 18 of 26 Go Live

Type here to search 82°F Cloudy ENG INTL 4:42 PM 8/24/2022

File Edit Selection View Go Run Terminal Help ASSIGNMENT_BGE033.ipynb - Visual Studio Code

ASSIGNMENT_BGE033.ipynb

C: > Users > DELL > Desktop > ASSIGNMENT_BGE033.ipynb > M↓Q2.Perform layerstacking and mosaicing lab

+ Code + Markdown | Run All Clear Outputs of All Cells Restart Interrupt | Variables Outline ··· myenv (Python 3.8.13)

```
# Creating a blank 3bands file
out_ds = driver.Create('compositefinal.tif',data_list[0].GetRasterBand(1).XSize,data_list[0].GetRasterBand(1).YSize,3,data_list[0].GetRasterBand(1).DataType)
```

[20] ✓ 0.1s Python

```
# obtaining and setting projection and transformation info
out_ds.SetProjection(data_list[0].GetProjection())
out_ds.SetGeoTransform(data_list[0].GetGeoTransform())
```

[21] ✓ 0.1s Python

```
0
```

```
# setting up Band info
out_ds.GetRasterBand(3).WriteArray(data_list[0].GetRasterBand(1).ReadAsArray())
out_ds.GetRasterBand(2).WriteArray(data_list[1].GetRasterBand(1).ReadAsArray())
out_ds.GetRasterBand(1).WriteArray(data_list[2].GetRasterBand(1).ReadAsArray())
```

[22] ✓ 6.4s Python

```
0
```

```
# clearing cache files at the end
out_ds.FlushCache()
del files
```

[23] ✓ 0.8s Python

[ ] Python

⊗ 0 ⚠ 2 Jupyter Server: Local Cell 18 of 26 Go Live

Type here to search 82°F Cloudy ENG INTL 4:42 PM 8/24/2022

Untitled - ArcMap

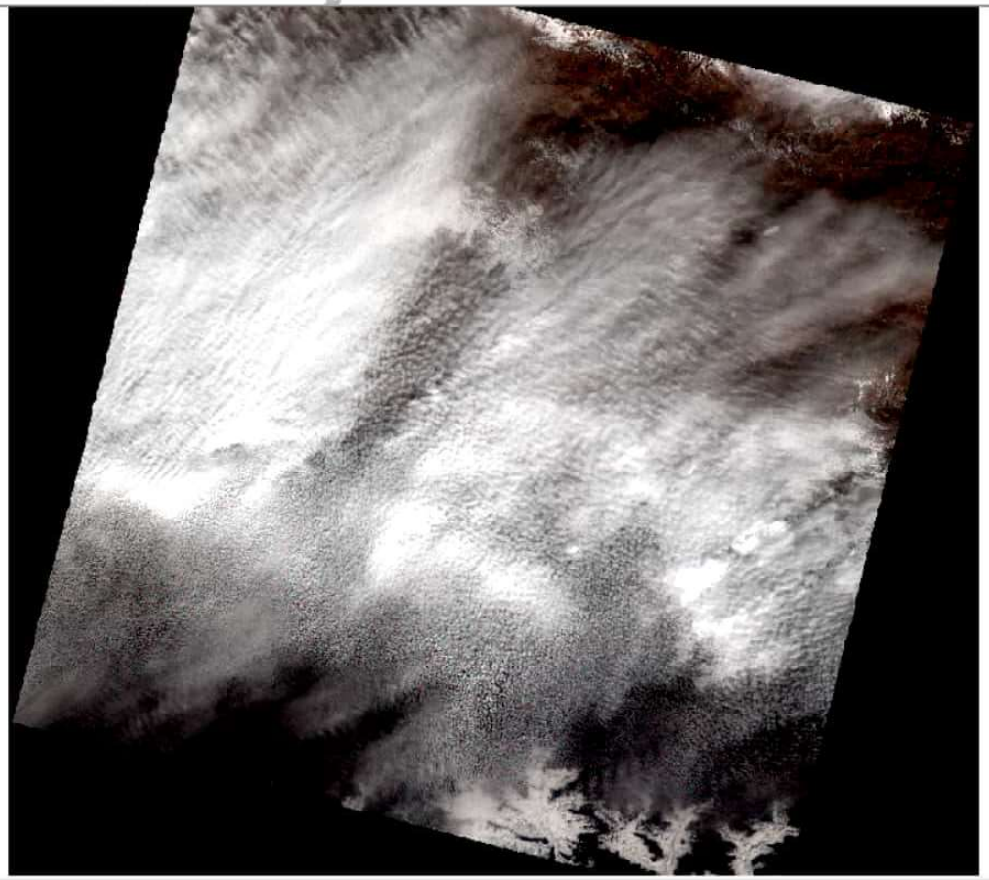
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:1,250,000

Editor

Table Of Contents

Layers
- compositefinal.tif
  - RGB
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3



Edit Sketch Properties | Attributes | Create Features | ArcToolbox | Catalog

28290.176 3238833.194 Meters

Type here to search

82°F Cloudy

ENG INTL 4:35 PM 8/24/2022