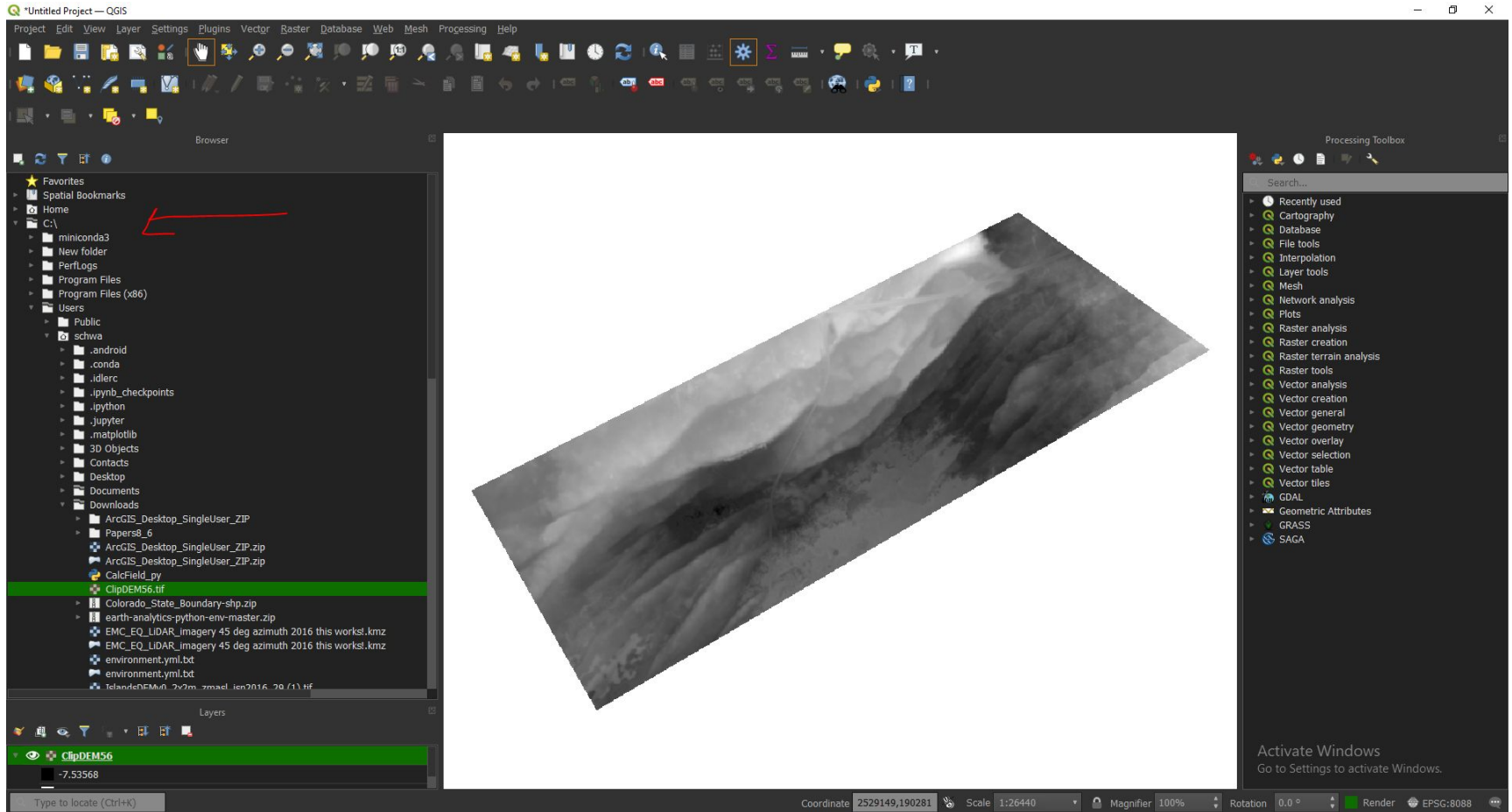


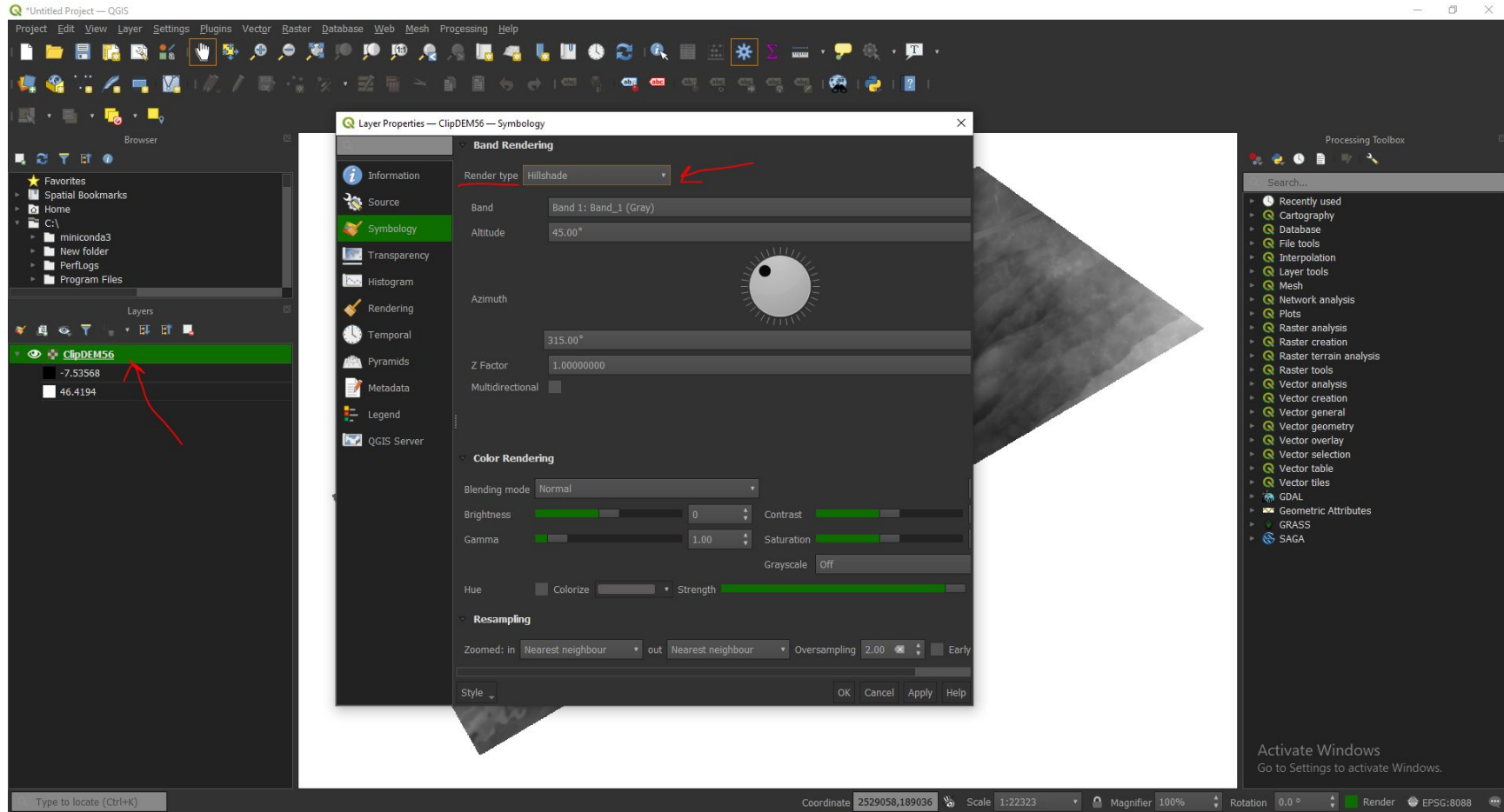
D:L tool tutorial

spring 2021

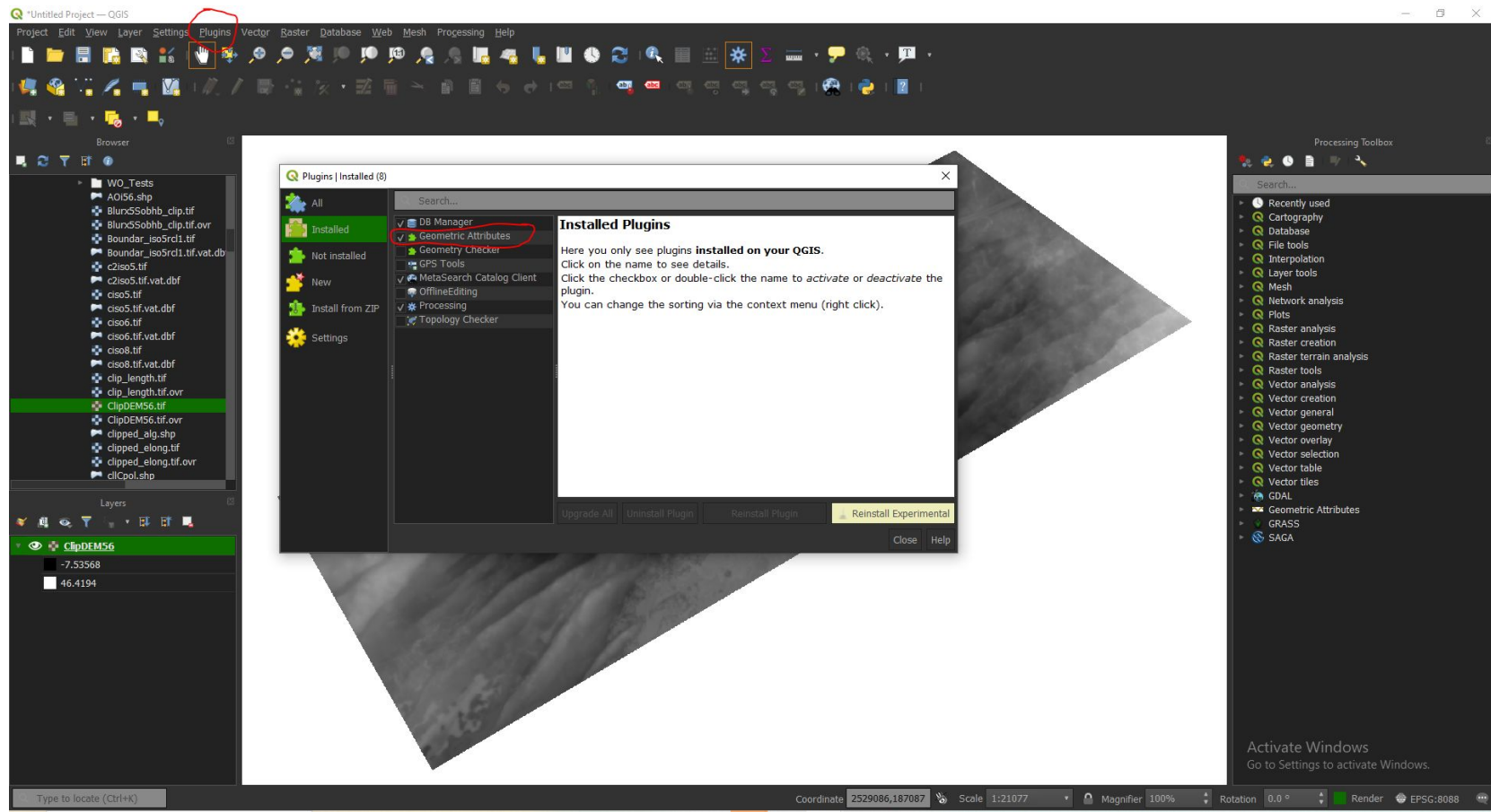
Navigate to DEM in downloads folder and add to map



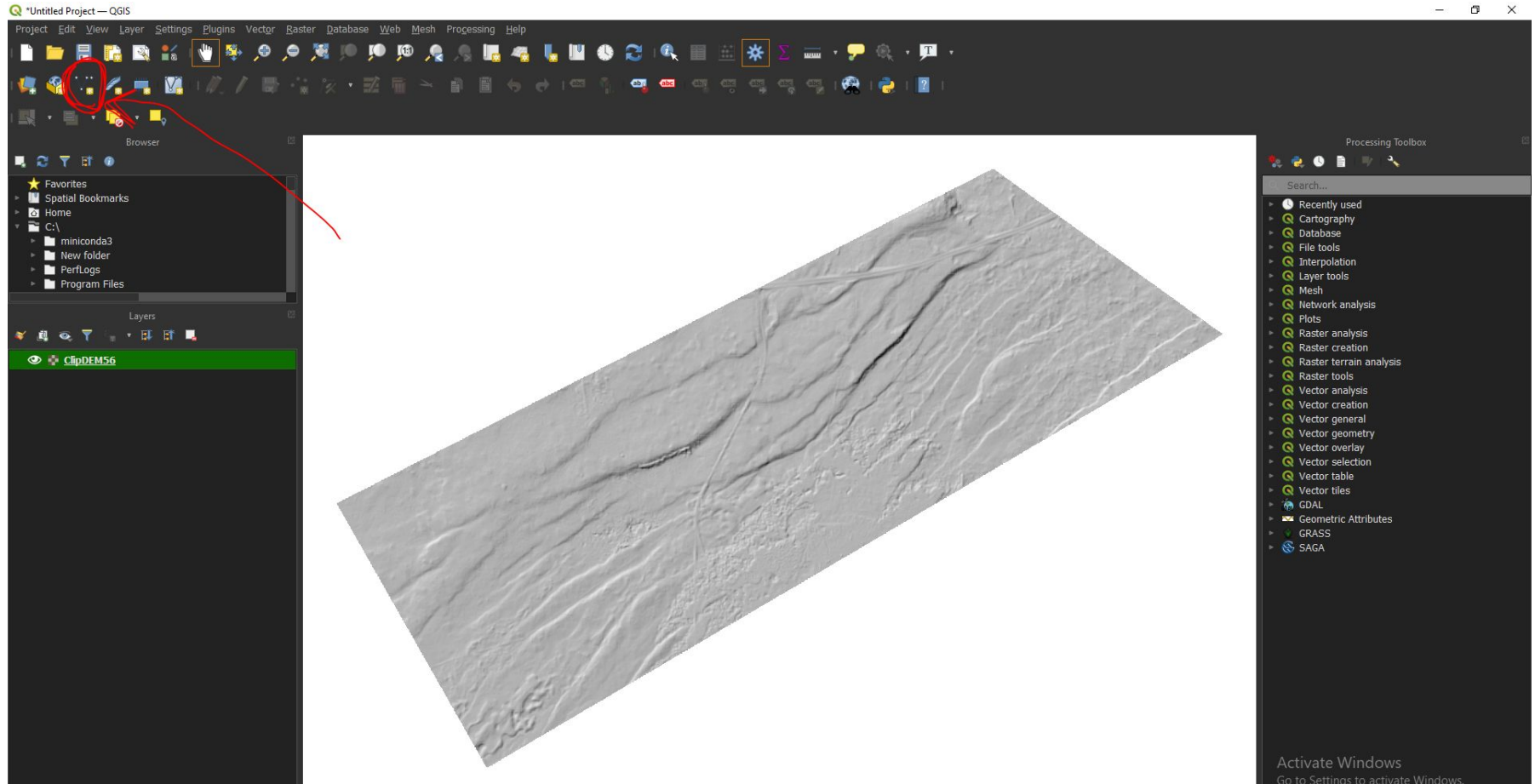
Right click on DEM, select *Properties*, go to *Symbology*, select *Render Type* and choose *Hillshade*



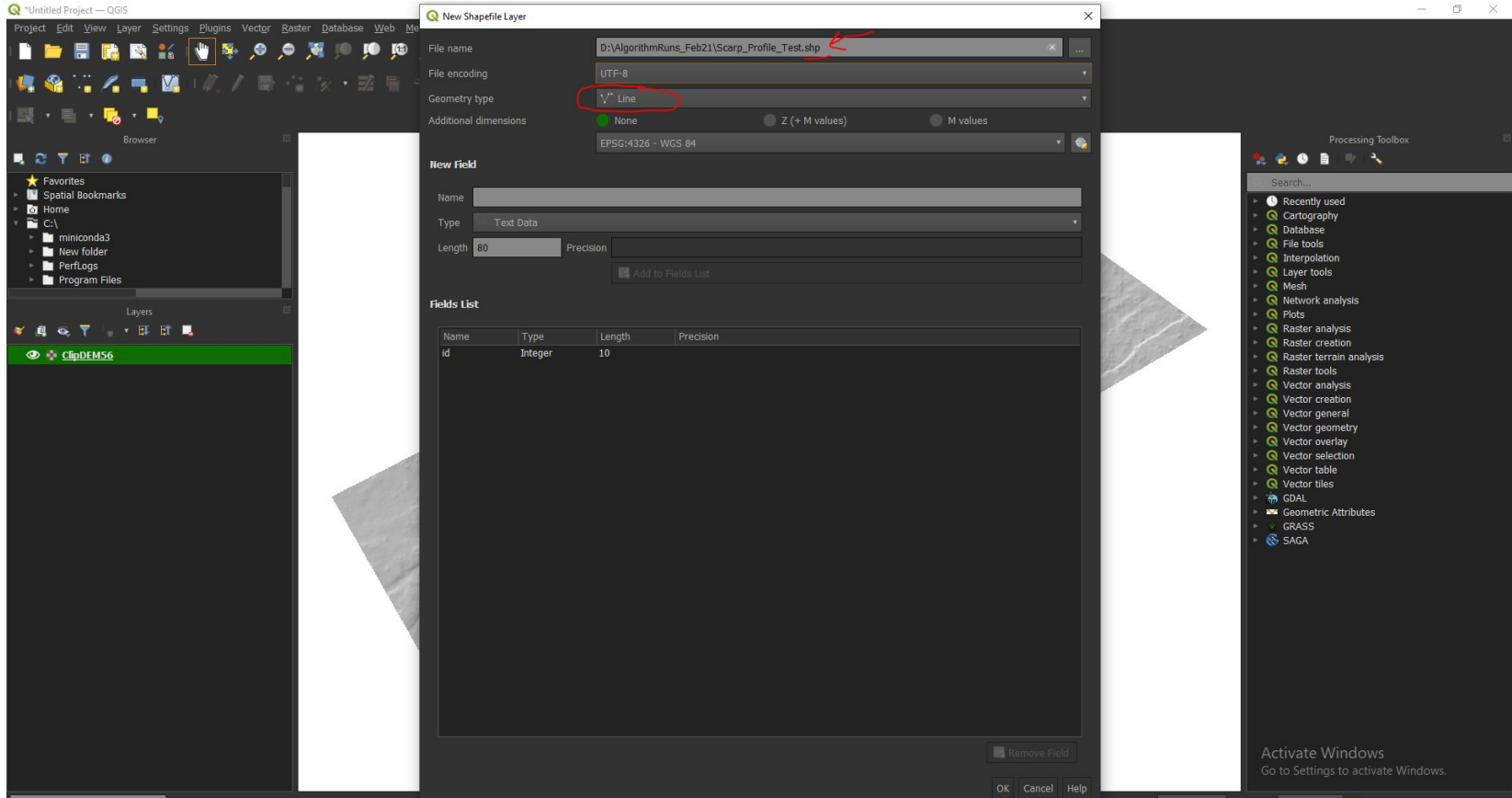
Go to plugins and make sure the Geometric Attributes Plugin is installed



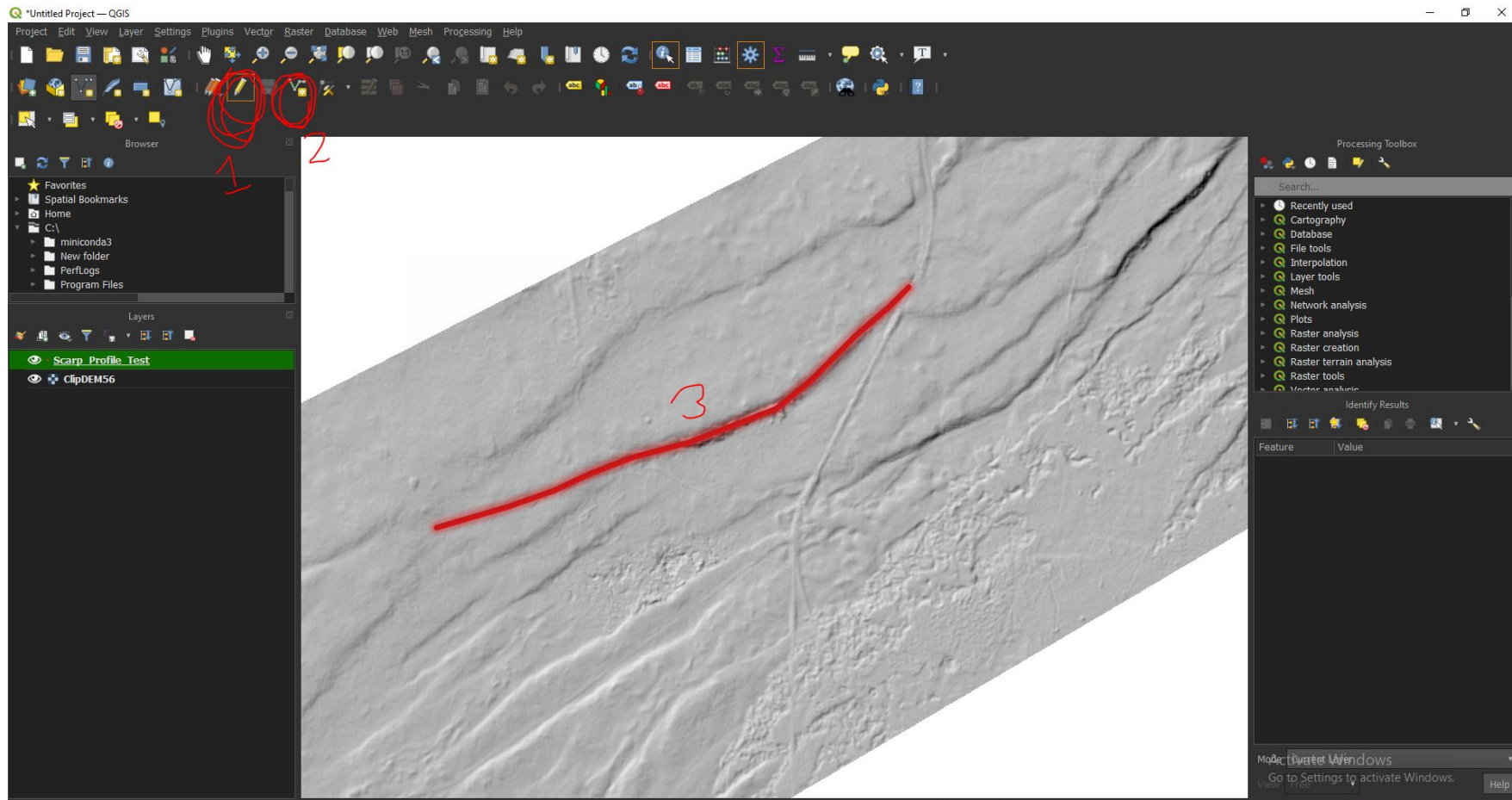
Select New shape file tool



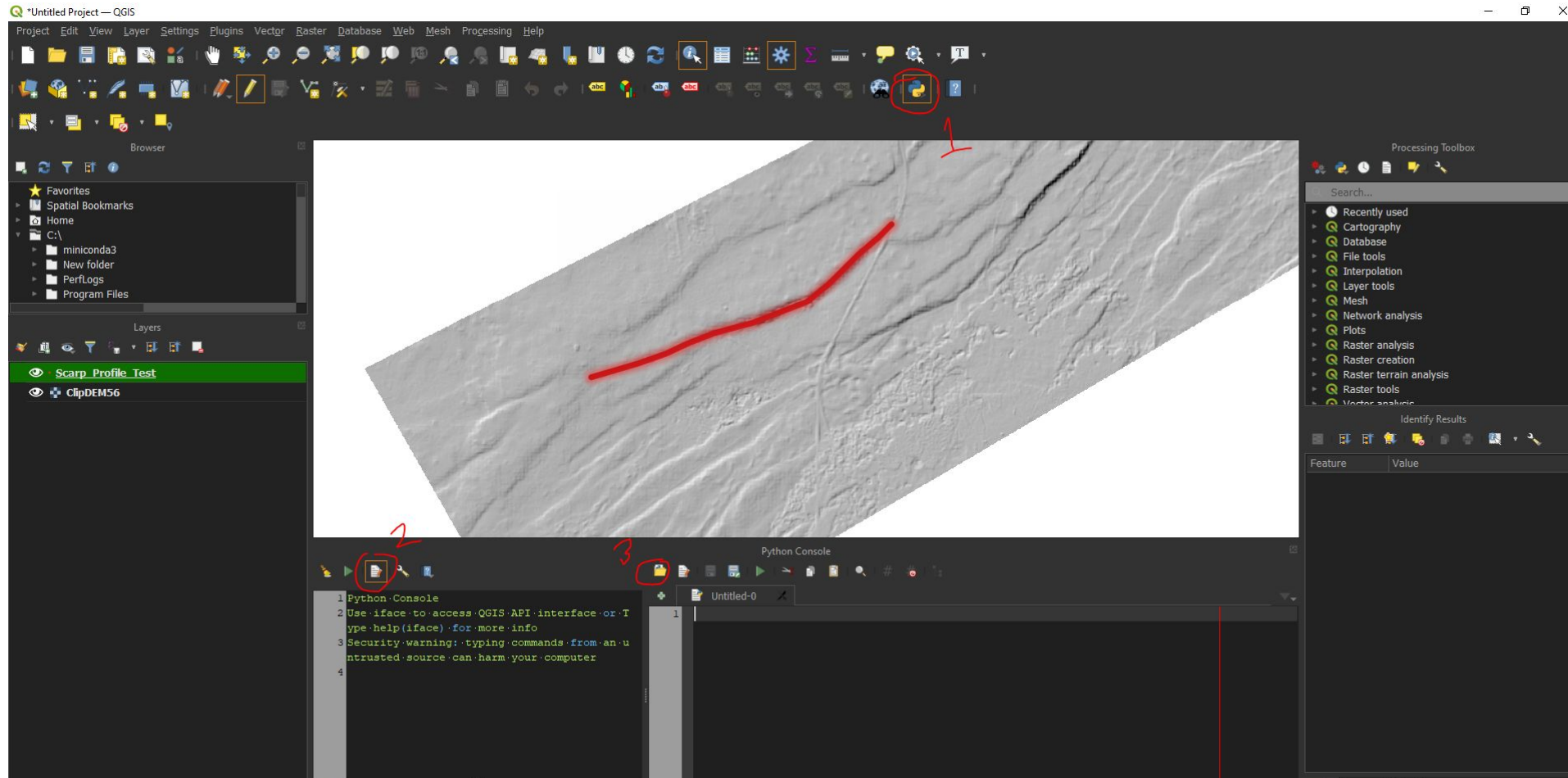
Navigate to desired folder and name shapefile; make sure its an ESRI shapefile format and select 'Line' then click ok



Select Toggle Editing, then Add Line Feature; Draw profile, Save edits (in between Toggle and Add Tools), Disable editing by clicking Toggle Editing tool again



Click on the Python Console and Select the Python Editor; select Open Script



Navigate to python Script and open

Untitled Project — QGIS

The screenshot displays the QGIS desktop environment. The main window is titled 'Untitled Project — QGIS'. The top menu bar includes 'Project', 'Edit', 'View', 'Layer', 'Settings', 'Plugins', 'Vector', 'Raster', 'Database', 'Web', 'Mesh', 'Processing', and 'Help'. The toolbar contains various icons for file operations, editing, and analysis. The left sidebar shows the 'Browser' panel with 'Favorites' and 'Spatial Bookmarks' sections. The 'Layers' panel at the bottom left lists 'Scarp_Profile_Test' and 'ClipDEM56'. The 'Processing Toolbox' on the right side contains a search bar and a list of tool categories: 'Recently used', 'Cartography', 'Database', 'File tools', 'Interpolation', 'Layer tools', 'Mesh', 'Network analysis', 'Plots', 'Raster analysis', 'Raster creation', 'Raster terrain analysis', 'Raster tools', and 'Vector analysis'. The 'Identify Results' panel is also visible, showing 'Feature' and 'Value' columns. The 'Open File' dialog box is open in the center, showing the file explorer view. The current directory is 'This PC > IcelandExHD (D:) > NLSdataV7 > Python Scripts > FINAL_Scripts'. The file list shows four files: 'Quantify_Shape' (4 KB), 'updated_shape_quant2_26' (2 KB), 'Weighted_Overlay' (3 KB), and 'WorkingDL_modifies3_3' (5 KB). The 'File name' field is set to 'WorkingDL_modifies3_3' and the file type is 'Script file (*.py)'. The 'Open' button is highlighted. The 'Python Console' at the bottom shows the following text: '1 Python Console', '2 Use iface to access QGIS API interface or type help(iface) for more info', '3 Security warning: typing commands from an untrusted source can harm your computer', and '4'.

Open File

File name: WorkingDL_modifies3_3

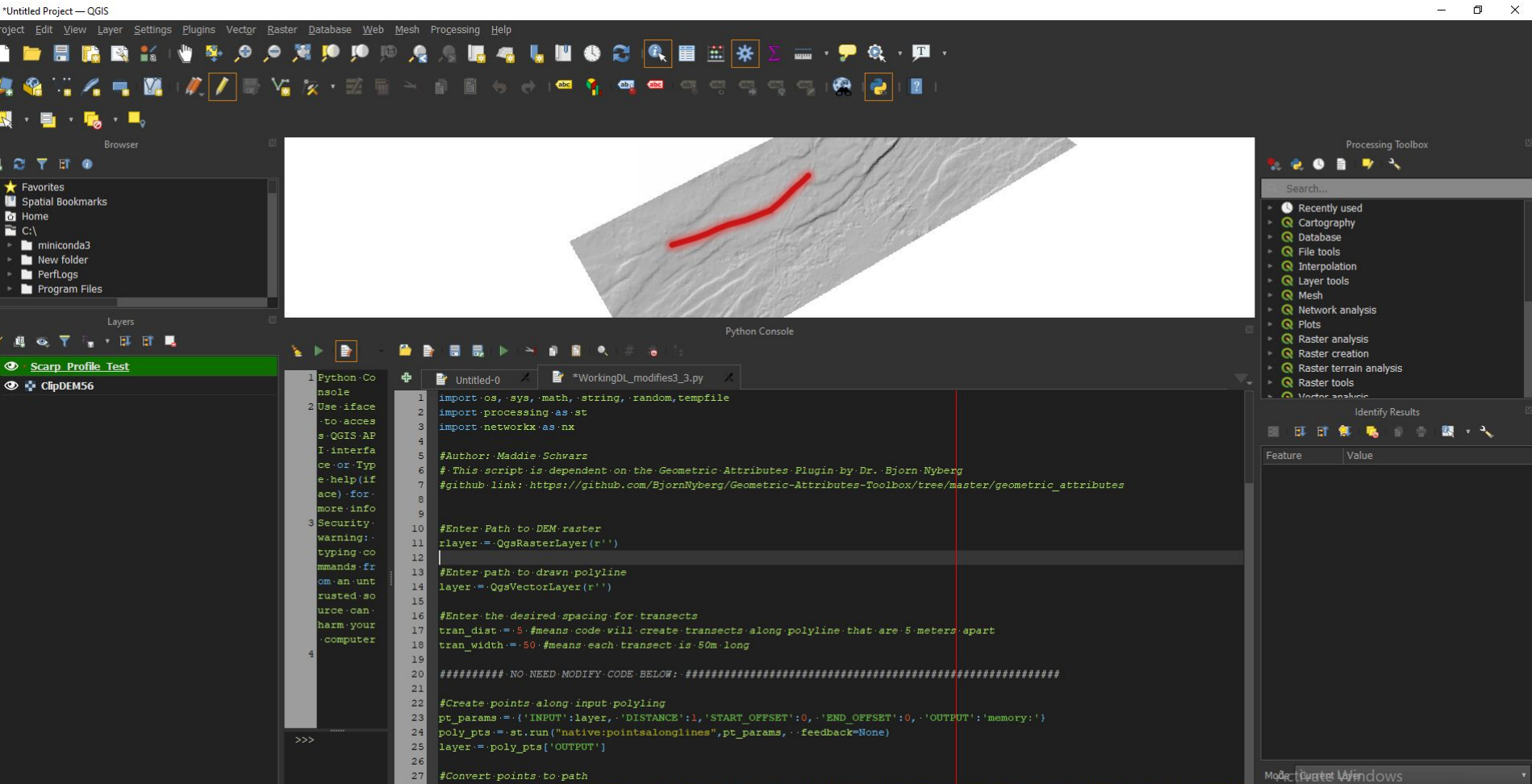
Script file (*.py)

Open Cancel

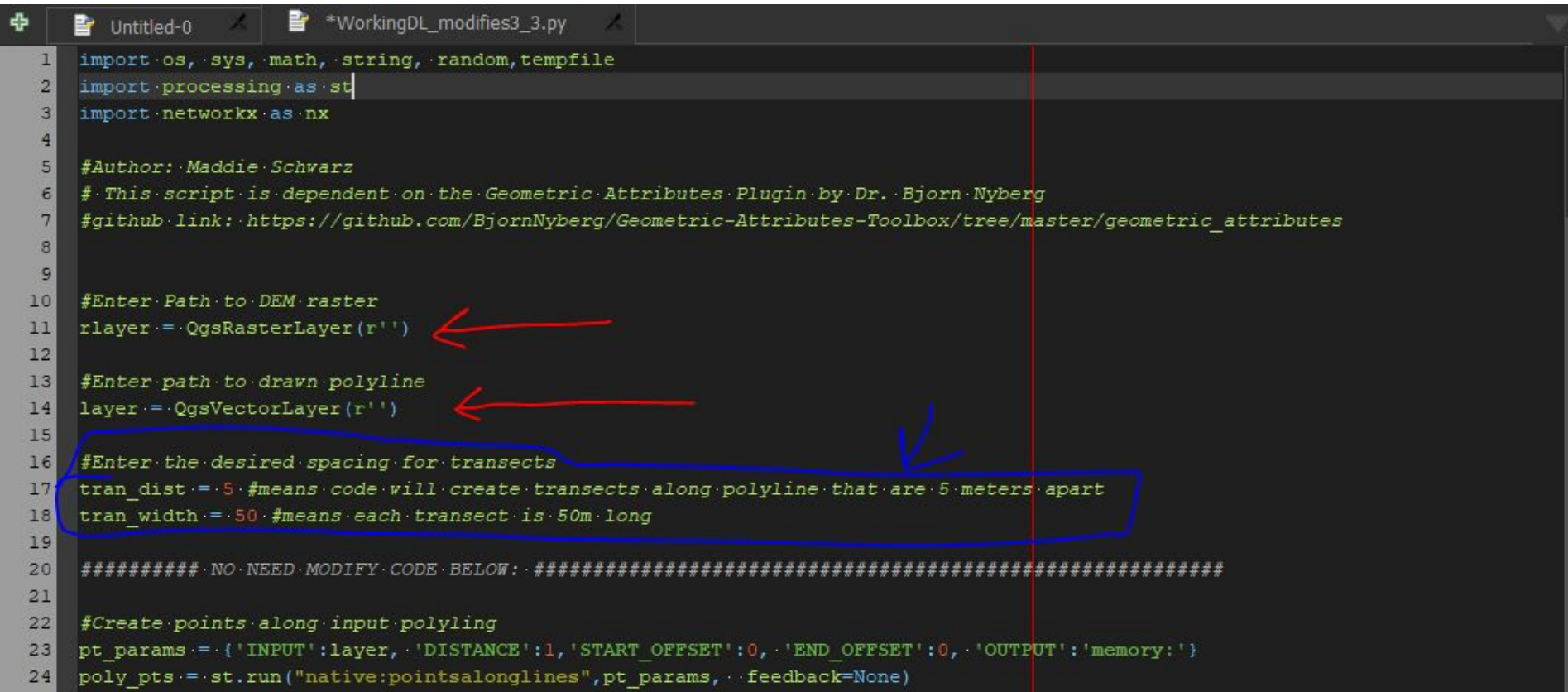
Python Console

```
1 Python Console
2 Use iface to access QGIS API interface or type help(iface) for more info
3 Security warning: typing commands from an untrusted source can harm your computer
4
```

The script will look like this:



Should only need to modify these three lines by entering the paths to your DEM raster, the Drawn Profile polyline, and specifying how wide the transects should be and how spaced apart they are



The image shows a code editor window with a dark theme. The title bar shows two tabs: 'Untitled-0' and '*WorkingDL_modifies3_3.py'. The code is a Python script for processing a DEM raster and creating transects. Annotations include two red arrows pointing to lines 11 and 14, and a blue arrow pointing to line 16. A blue box highlights lines 17 and 18.

```
1 import os, sys, math, string, random, tempfile
2 import processing as st
3 import networkx as nx
4
5 #Author: Maddie Schwarz
6 # This script is dependent on the Geometric Attributes Plugin by Dr. Bjorn Nyberg
7 #github link: https://github.com/BjornNyberg/Geometric-Attributes-Toolbox/tree/master/geometric_attributes
8
9
10 #Enter Path to DEM raster
11 rlayer = QgsRasterLayer(r'')
12
13 #Enter path to drawn polyline
14 layer = QgsVectorLayer(r'')
15
16 #Enter the desired spacing for transects
17 tran_dist = 5 #means code will create transects along polyline that are 5 meters apart
18 tran_width = 50 #means each transect is 50m long
19
20 ##### NO NEED MODIFY CODE BELOW: #####
21
22 #Create points along input polyling
23 pt_params = {'INPUT': layer, 'DISTANCE': 1, 'START_OFFSET': 0, 'END_OFFSET': 0, 'OUTPUT': 'memory:'}
24 poly_pts = st.run("native:pointsalonglines", pt_params, feedback=None)
```

To quickly get your layer paths, right click on the layers, go to the *Source* tab and copy paste the paths in the script

The screenshot shows the QGIS interface with the 'Layer Properties' dialog open for the layer 'Scarp_Profile_Test'. The 'Information' tab is selected, displaying metadata for the layer. The 'Path' field is highlighted with a green box and a red arrow, indicating the file path to the shapefile. The 'Layers' panel on the left shows the layer 'Scarp_Profile_Test' selected with a red arrow. The 'Source' tab is also visible in the Layer Properties dialog, which is where the path would be copied.

Information from provider

Name	Scarp_Profile_Test
Path	D:\AlgorithmRuns_Feb21\Scarp_Profile_Test.shp
Storage	ESRI Shapefile
Comment	
Encoding	UTF-8
Geometry	Line (MultiLineString)
CRS	EPSG:4326 - WGS 84 - Geographic
Extent	2530644.1033344282768667,187206.8716065972112119 : 2532413.0447541233152151,188107.5846834035473876
Unit	degrees
Feature count	1

Identification

Identifier	
Parent Identifier	
Title	
Type	dataset
Language	
Abstract	
Categories	
Keywords	

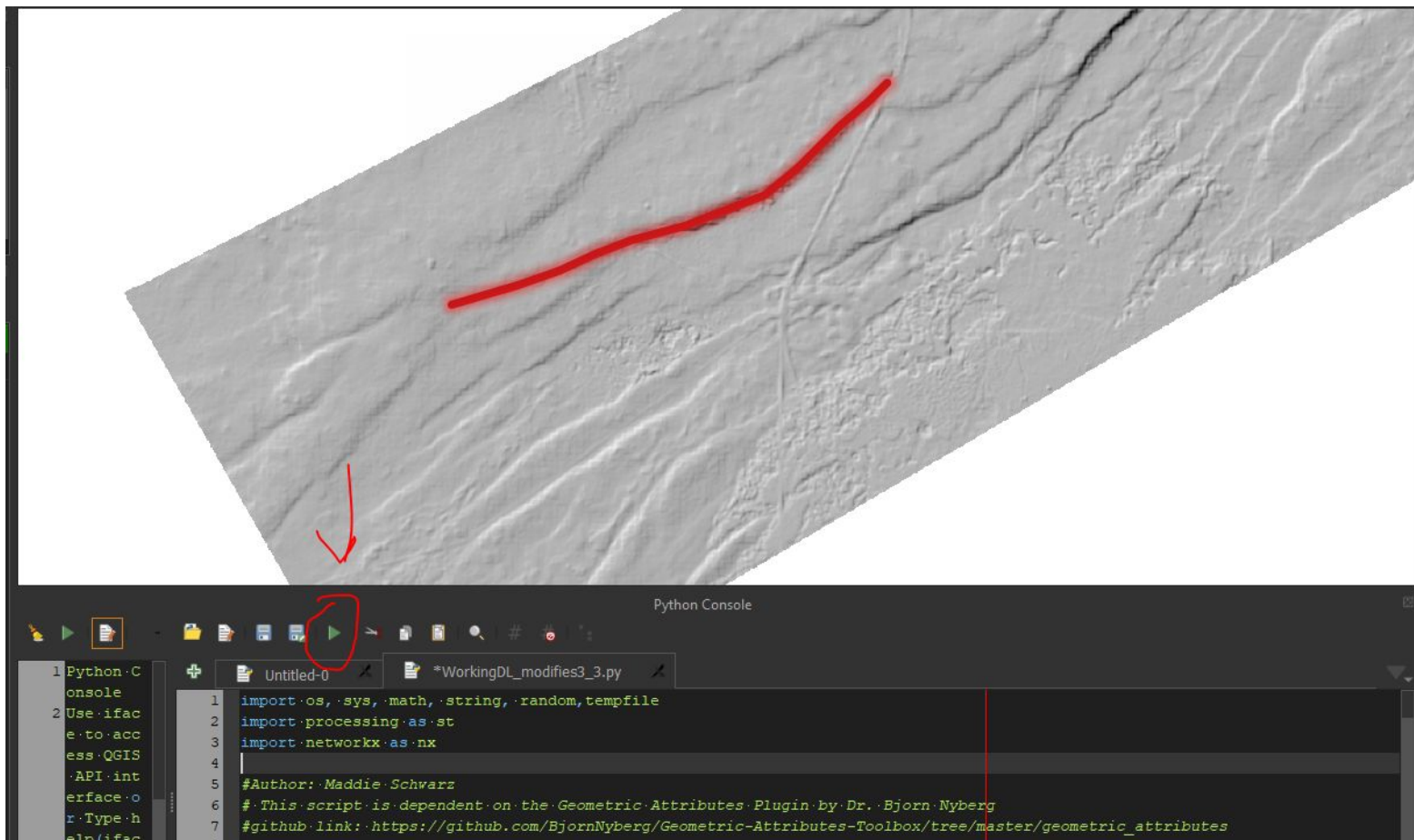
Extent

CRS	
Spatial Extent	CRS: - Projected X Minimum: 0 Y Minimum: 0 X Maximum: 0 Y Maximum: 0
Temporal Extent	Start:

Pasted paths should look something like this:

```
+  Untitled-0  *WorkingDL_modifies3_3.py
1  import os, sys, math, string, random, tempfile
2  import processing as st
3  import networkx as nx
4
5  #Author: Maddie Schwarz
6  # This script is dependent on the Geometric Attributes Plugin by Dr. Bjorn Nyberg
7  #github link: https://github.com/BjornNyberg/Geometric-Attributes-Toolbox/tree/master/geometric\_attributes
8
9
10 #Enter Path to DEM raster
11 rlayer = QgsRasterLayer(r'D:\AlgorithmRuns_Feb21\Tile56\Layers2_19\ClipDEM56.tif')
12
13 #Enter path to drawn polyline
14 layer = QgsVectorLayer(r'D:\AlgorithmRuns_Feb21\Scarp_Profile_Test.shp')
15
16 #Enter the desired spacing for transects
17 tran_dist = .5 #means code will create transects along polyline that are 5 meters apart
18 tran_width = .50 #means each transect is 50m long
19
```


Now press the Green arrow to run the code



Code should run and print displacement values in the terminal; also will add a shapefile of the transects to the map

The screenshot displays the QGIS desktop environment. The main map window shows a grayscale DEM with a red line and a series of blue perpendicular transects. A red arrow points from the 'output' layer in the Layers panel to the transects on the map. The Layers panel on the left lists 'output', 'Scarp_Profile_Test', and 'ClipDEM56'. The Processing Toolbox on the right is open, showing a search bar and a list of tool categories. The Python Console at the bottom contains two windows: 'Untitled-0' and '*WorkingDL_modifies3_3.py'. The 'Untitled-0' window shows a list of numerical values from line 399 to 410, with a red bracket highlighting lines 403 to 409. The '*WorkingDL_modifies3_3.py' window shows Python code for creating a raster layer and a vector layer of transects, with comments explaining the parameters.

QGIS Interface Components:

- Top Menu Bar:** Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, Processing, Help.
- Toolbars:** Standard toolbar, Browser, Layers, Processing Toolbox.
- Browser Panel:** Favorites, Spatial Bookmarks, Home, C:\, miniconda3, New folder, PerfLogs, Program Files.
- Layers Panel:** output, Scarp_Profile_Test, ClipDEM56.
- Processing Toolbox:** Search..., Recently used, Cartography, Database, File tools, Interpolation, Layer tools, Mesh, Network analysis, Plots, Raster analysis, Raster creation, Raster terrain analysis, Raster tools, Vector analysis.
- Identify Results Panel:** Feature, Value.
- Python Console:** Untitled-0, *WorkingDL_modifies3_3.py.

Python Console Code (Untitled-0):

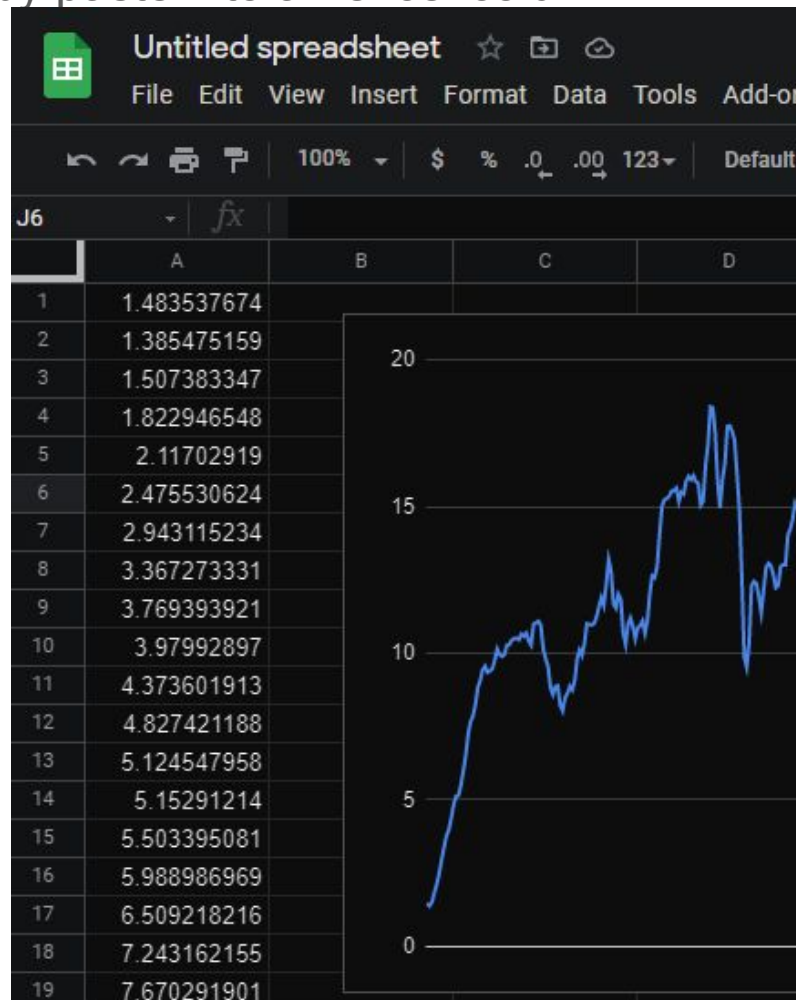
```
399 2.498669670654297
400 2.548381805419922
401 2.542827606201172
402 2.7049789428710938
403 2.6831016540527344
404 2.698141098022461
405 2.5830116271972656
406 2.6445236206054688
407 2.662059783935547
408 2.4428024291992188
409 2.6701889038085938
410
```

Python Console Code (*WorkingDL_modifies3_3.py):

```
10 #Enter Path to DEM raster
11 rlayer = QgsRasterLayer(r'D:\AlgorithmRuns_Feb21\Tile56\Layers2_19
12
13 #Enter path to drawn polyline
14 layer = QgsVectorLayer(r'D:\AlgorithmRuns_Feb21\Scarp_Profile_Test
15
16 #Enter the desired spacing for transects
17 tran_dist = .5 #means code will create transects along polyline tha
18 tran_width = .50 #means each transect is 50m long
19
20 ##### NO NEED MODIFY CODE BELOW #####
```


Highlight the printed displacement values and copy paste into an excel column

```
e.info
3 Security warning: typing commands from an untrusted source can harm
  your computer
4 >>> exec(open('C:/Users/schwa/AppData/Local/Temp/tmp9no9l_8x.py'.e
  ncode('utf-8')).read())
5 number of raster bands: 1
6 1.4835376739501953
7 1.3854751586914062
8 1.5073833465576172
9 1.822946548461914
10 2.1170291900634766
11 2.4755306243896484
12 2.943115234375
13 3.3672733306884766
14 3.7693939208984375
15 3.979928970336914
16 4.373601913452148
17 4.827421188354492
18 5.124547958374023
19 5.152912139892578
20 5.503395080566406
21 5.988986968994141
22 6.509218215942383
23 7.243162155151367
24 7.670291900634766
>>>
```



Highlight column and insert chart and you get a profile



To get scarp length on x axis, create column that increases per the transect distance specified

Length (m)	Throw (m)
0	1.63545227
=B2+10	1.4908905
20	1.62434006
30	2.24407578
40	2.73412514
50	4.7118206
60	5.68340683
70	5.05438995
80	6.65823555
90	6.64239121
100	7.20480537
110	7.51750374
120	10.0867062
130	11.2479134
140	11.1054268
150	11.3726044
160	12.2217464
170	12.1111605



```
16 #Enter the desired spacing for transects
17 tran_dist = 5 #means code will create transects along polyline
18 tran_width = 50 #means each transect is 50m long
19
20 ##### NO NEED MODIFY CODE BELOW: #####
```

Important note:

The profile will sample in the direction that you drew the along strike polyline

In this example, the profile reads left to right

