

```
In [1]: import requests
import json
import pprint
import arcpy
```

```
In [2]: arcpy.env.workspace = 'D:/Users/Owner/Documents/ArcGIS/Projects/RoseL_Lab2/RoseL_Lab2.gdb'
```

```
In [3]: base = "https://resources.gisdata.mn.gov/pub/data/elevation/lidar/"


r = requests.get(base)

r.content
```

```
Out[3]: b'<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">\n<html>\n<head>\n  <title>Index of /pub/data/elevation/lidar</title>\n</head>\n<body>\n<h1>Index of /pub/data/elevation/lidar</h1>\n<table><tr>\n<th></th><th><a href="?C=N;O=D">Name</a></th><th><a href="?C=M;O=A">Last modified</a></th><th><a href="?C=S;O=A">Size</a></th><th><a href="?C=D;O=A">Description</a></th></tr><tr><th colspan="5"><hr></th></tr>\n<tr><td valign="top"></td><td><a href="/pub/data/elevation/">Parent Directory</a></td><td>&nbsp;</td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="LAS_File_Processing_Using_LASTTOOLS.pdf">LAS_File_Processing_Using_LASTTOOLS.pdf</a></td><td align="right">26-Dec-2012 08:23 </td><td align="right">695K</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="about_this_data.rtf">about_this_data.rtf</a></td><td align="right">27-Mar-2012 16:43 </td><td align="right"> 43K</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="county/">county/</a></td><td align="right">09-Jul-2014 11:09 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="county_mosaic_readme_first.rtf">county_mosaic_readme_first.rtf</a></td><td align="right">10-Jun-2014 21:26 </td><td align="right">643K</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="documentation/">documentation/</a></td><td align="right">28-Apr-2014 15:47 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="examples/">examples/</a></td><td align="right">21-Mar-2012 09:07 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="projects/">projects/</a></td><td align="right">17-Jul-2014 08:18 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="q250k/">q250k/</a></td><td align="right">31-Oct-2016 14:30 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="raw_LiDAR_Data_README.rtf">raw_LiDAR_Data_README.rtf</a></td><td align="right">15-Mar-2012 13:21 </td><td align="right"> 55K</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="readme_first.rtf">readme_first.rtf</a></td><td align="right">21-Mar-2012 08:55 </td><td align="right"> 55K</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="readme_first.txt">readme_first.txt</a></td><td align="right">27-Mar-2012 17:26 </td><td align="right">948 </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="state/">state/</a></td><td align="right">27-Apr-2016 13:31 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="tile_index/">tile_index/</a></td><td align="right">04-Dec-2012 11:04 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="tools/">tools/</a></td><td align="right">01-Feb-2013 08:45 </td><td align="right"> - </td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="training/">tr
```

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aining/
```

	01-Jul-2013 11:35	
-		

	watchme_first.swf	29-Jun-2012 12:03
	9.3M	

5		
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at resources.gisdata.mn.gov Port 80

```
In [4]: ex_dir = base + "examples/lidar_sample/las/"

files = requests.get(ex_dir)

print(files.content)
```

```
b'<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">\n<html>\n<head>\n  <title>Index of /pub/data/elevation/lidar/examples/lidar_sample/las</title>\n</head>\n<body>\n<h1>Index of /pub/data/elevation/lidar/examples/lidar_sample/las</h1>\n<table><tr><th></th><th><a href="?C=N;O=D">Name</a></th><th><a href="?C=M;O=A">Last modified</a></th><th><a href="?C=S;O=A">Size</a></th><th><a href="?C=D;O=A">Description</a></th></tr><tr><th colspan="5"><hr></th></tr>\n<tr><td valign="top"></td><td><a href="/pub/data/elevation/lidar/examples/lidar_sample/">Parent Directory</a></td><td>&nbsp;</td><td align="right">-</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-12-05.las">4342-12-05.las</a></td><td align="right">21-Mar-2012 09:10</td><td align="right">372M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-12-06.las">4342-12-06.las</a></td><td align="right">21-Mar-2012 09:10</td><td align="right">369M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-12-07.las">4342-12-07.las</a></td><td align="right">21-Mar-2012 09:12</td><td align="right">392M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-13-03.las">4342-13-03.las</a></td><td align="right">21-Mar-2012 09:12</td><td align="right">388M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-13-04.las">4342-13-04.las</a></td><td align="right">21-Mar-2012 09:14</td><td align="right">432M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-13-05.las">4342-13-05.las</a></td><td align="right">21-Mar-2012 09:14</td><td align="right">426M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-13-06.las">4342-13-06.las</a></td><td align="right">21-Mar-2012 09:16</td><td align="right">421M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-13-07.las">4342-13-07.las</a></td><td align="right">21-Mar-2012 09:16</td><td align="right">380M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-14-03.las">4342-14-03.las</a></td><td align="right">21-Mar-2012 09:18</td><td align="right">437M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-14-04.las">4342-14-04.las</a></td><td align="right">21-Mar-2012 09:18</td><td align="right">461M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-14-05.las">4342-14-05.las</a></td><td align="right">21-Mar-2012 09:20</td><td align="right">333M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-15-03.las">4342-15-03.las</a></td><td align="right">21-Mar-2012 09:20</td><td align="right">456M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-15-04.las">4342-15-04.las</a></td><td align="right">21-Mar-2012 09:22</td><td align="right">470M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-16-03.las">4342-16-03.las</a></td><td align="right">21-Mar-2012 09:23</td><td align="right">434M</td><td>&nbsp;</td></tr>\n<tr><td valign="top"></td><td><a href="4342-16-04.las">4342-16-04.las</a></td><td align="right">21-Mar-2012 09:24 </td><td align="right">437M</td><td>&nbsp;</td></tr>\n<tr><th colspan="5"><hr></th></tr>\n</table>\n<address>Apache/2.2.15 (Red Hat) Server at resources.gisdata.mn.gov Port 80</address>\n</body></html>\n'
```

```
In [5]: las_sample = requests.get(ex_dir + "/4342-14-05.las")  ##this las is the smallest (and it still took a while).
```

```
In [6]: open("4342-14-05.las", "wb").write(las_sample.content)
```

```
Out[6]: 349403619
```

```
In [7]: arcpy.LasDatasetToTin_3d("4342-14-05.las", "Sample_tin", "WINDOW_SIZE")
```

```
Out[7]:
```

Output

D:/Users/Owner/Documents/ArcGIS/Projects/RoseL_Lab2\Sample_tin

Messages

Start Time: Thursday, February 18, 2021 2:00:10 PM

Succeeded at Thursday, February 18, 2021 2:00:11 PM (Elapsed Time: 0.72 seconds)

```
In [8]: arcpy.ddd.ExtractLas("4342-14-05.las", "D:/Users/Owner/Documents/ArcGIS/Projects/RoseL_Lab2")
```

```
Out[8]:
```

Output

id	value
0	
1	D:/Users/Owner/Documents/ArcGIS/Projects/RoseL_Lab2

Messages

Start Time: Thursday, February 18, 2021 2:00:11 PM

Succeeded at Thursday, February 18, 2021 2:00:13 PM (Elapsed Time: 2.16 seconds)

```
In [9]: arcpy.MakeLasDatasetLayer_management("4342-14-05.las", "ground.las", cl
ass_code=[2,8])

arcpy.conversion.LasDatasetToRaster("ground.las", "DEM", "ELEVATION")

#DEM("4342-14-05.las", "ground.las", "DEM")
```

Out[9]:

Output

D:/Users/Owner/Documents/ArcGIS/Projects/RoseL_Lab2/RoseL_Lab2.gdb\DEM

Messages

Start Time: Thursday, February 18, 2021 2:00:14 PM

Succeeded at Thursday, February 18, 2021 2:00:16 PM (Elapsed Time: 1.79 seconds)

```
In [27]: aprx = 'D:/Users/Owner/Documents/ArcGIS/Projects/RoseL_Lab2/RoseL_Lab
2.aprx'
```

```
In [28]: aprx = arcpy.mp.ArcGISProject(aprx)
for m in aprx.listMaps():
    print("Map: " + m.name)
    for lyr in m.listLayers():
        print("  " + lyr.name)
```

```
Map: Map
  4342-14-05.las
  World Topographic Map
  World Hillshade
Map: Map1
  Sample_tin
  World Topographic Map
  World Hillshade
Map: Map2
  DEM
  World Topographic Map
  World Hillshade
Map: Scene
  4342-14-05.las
  World Topographic Map
  World Hillshade
```

In []: