```
View Insert Cell Kernel Widgets
                                           Help
                                                                                                            Python 3 O
                                              ~
    | % | ₾ | T | ↑ | ♦ | N Run | ■ | C | ♦ | Code
            1 | #import the necessary packages
            3 import arcpy
             4 import requests as r
             5 import ftplib
           1 #build the extract part of the ETL to MN DNR
             3 from ftplib import FTP
             4 | ftp = FTP ('ftp.lmic.state.mn.us')
             5 | ftp.login()
             6 | ftp.cwd("/pub/data/elevation/lidar/county/winona/laz/")
             7 ftp.retrlines('LIST')
                                   5070
                                            21271027 Mar 12 2012 4342-26-62.laz
                         3 12102
            -rw-rw-r--
                        3 12102
                                   5070
                                            21647386 Mar 12 2012 4342-26-63.laz
            -rw-rw-r--
                        3 12102
                                  5070
                                           23466295 Mar 12 2012 4342-26-64.laz
            -rw-rw-r--
            -rw-rw-r--
                        3 12102
                                  5070 19799671 Mar 12 2012 4342-27-62.laz
                       2 12102
                                  5070 22424577 Mar 12 2012 4342-27-63.laz
            -rw-rw-r--
                       2 12102
                                           27995870 Mar 12 2012 4342-27-64.laz
            -rw-rw-r--
                        3 12102
                                  5070
                                           23379726 Mar 12 2012 4342-28-62.laz
            -rw-rw-r--
                                  5070
                        2 12102
                                           22761742 Mar 12 2012 4342-28-63.laz
            -rw-rw-r--
                       2 12102
                                  5070
                                           28042351 Mar 12 2012 4342-28-64.laz
            -rw-rw-r--
            -rw-rw-r--
                       4 12102
                                           23552454 Mar 15 2012 4342-29-62.laz
                        2 12102
                                  5070
                                           22473227 Mar 12 2012 4342-29-63.laz
            -rw-rw-r--
                                  5070
                       2 12102
                                           27153945 Mar 12 2012 4342-29-64.laz
            -rw-rw-r--
                       3 12102
                                           21117272 Mar 15 2012 4342-30-62.laz
            -rw-rw-r--
                                           24409455 Mar 12 2012 4342-30-63.laz
                        2 12102
                                  5070
            -rw-rw-r--
                                  5070 24356647 Mar 12 2012 4342-30-64.laz
                        2 12102
            -rw-rw-r--
                                  5070 23280913 Mar 15 2012 4342-31-62.laz
                       3 12102
            -rw-rw-r--
                       2 12102
                                  5070
                                           24302667 Mar 12 2012 4342-31-63.laz
            -rw-rw-r--
                        2 12102
                                  5070
                                           20516369 Mar 12 2012 4342-31-64.laz
            -rw-rw-r--
            -rw-rw-r--
                                  5070
                       3 12102
                                           18682627 Mar 15 2012 4342-32-62.laz
                        - 3 13103 E070 10E39717 M-- 13 3013 4343 93 €9 1-
In [ ]: ▶ 1 #download the data as a zipfile and unzip for use in Pro
             3 with open('elevation data.gdb.zip', 'wb') as fp:
                   ftp.retrbinary('RETR elevation_data.gdb.zip' , fp.write)
In []: 1 from zipfile import ZipFile
             3 # Create a ZipFile Object and load sample.zip in it
             4 with ZipFile('elevation_data.gdb.zip', 'r') as zipObj:
             5 # Extract all the contents of zip file in current directory
                  zipObj.extractall()
In [12]: | 1 #repeat the process the exact same way for the next dataset
            2 #use copy/paste when your for loop doesn't work
             4 from ftplib import FTP
             5 ftp = FTP ('ftp.lmic.state.mn.us')
            6 ftp.login()
             7 ftp.cwd("/pub/data/elevation/lidar/county/wabasha/")
             8 ftp.retrlines('LIST')
            -rw-rw-r--
                         4 12102
                                   5070
                                            29855242 Nov 16 2012 4342-18-51.laz
                        4 12102
                                   5070
                                           40905958 Nov 16 2012 4342-18-52.laz
            -rw-rw-r--
                        4 12102
                                            50636615 Nov 16 2012 4342-18-53.laz
            -rw-rw-r--
                        4 12102
                                   5070
            -rw-rw-r--
                                           52455681 Nov 16 2012 4342-18-54.laz
                       4 12102
                                  5070 46582547 Nov 16 2012 4342-18-55.laz
            -rw-rw-r--
                       4 12102
                                  5070
                                           21510536 Nov 16 2012 4342-18-56.laz
            -rw-rw-r--
                       4 12102
                                  5070
                                           20884604 Nov 16 2012 4342-18-57.laz
            -rw-rw-r--
                        2 12102
                                  5070
                                           13320162 Mar 12 2012 4342-18-58.laz
            -rw-rw-r--
                       4 12102
                                  5070 31325354 Nov 16 2012 4342-19-51.laz
            -rw-rw-r--
                        2 12102
                                           18904148 Mar 12 2012 4342-19-52.laz
            -rw-rw-r--
                        2 12102
                                  5070 20369548 Mar 12 2012 4342-19-53.laz
            -rw-rw-r--
                        2 12102
                                  5070 23101660 Mar 12 2012 4342-19-54.laz
            -rw-rw-r--
                                  5070 25193851 Mar 12 2012 4342-19-55.laz
            -rw-rw-r--
                       2 12102
                                  5070 22763208 Mar 12 2012 4342-19-56.laz
                       2 12102
            -rw-rw-r--
                                  5070 19024959 Mar 12 2012 4342-19-57.laz
            -rw-rw-r--
                        2 12102
                       2 12102 5070 12892912 Mar 12 2012 4342-19-58.laz
            -rw-rw-r--
            -rw-rw-r-- 2 12102
                                  5070 11407001 Mar 12 2012 4342-19-59.laz
                        2 12102
                                  5070 10464633 Mar 12 2012 4342-19-60.laz
            -rw-rw-r--
                        2 12102 5070
                                            23945484 Mar 12 2012 4342-19-61.laz
            -rw-rw-r--
           1 #wanted to do a for loop but it was taking too long
In [13]: N
             3 with open('elevation data.gdb.zip', 'wb') as fp:
                   ftp.retrbinary('RETR elevation data.gdb.zip' , fp.write)
In []: | 1 from zipfile import ZipFile
            3 # Create a ZipFile Object and load sample.zip in it
             4 with ZipFile('elevation data.gdb.zip', 'r') as zipObj:
             5 # Extract all the contents of zip file in current directory
                  zipObj.extractall()
           1 #and a third time for cropland data
            3 from ftplib import FTP
             4 ftp = FTP ('ftp.lmic.state.mn.us')
             5 ftp.login()
            6 ftp.cwd("/pub/gdrs/data/pub/us mn state mda/")
             7 ftp.retrlines('LIST')
            drwxr-xr-x 3 12110 5070
                                               4096 May 13 2016 agri agroecoregions
            -rw-r--r-- 1 12110
                                  5070
                                             701467 May 13 2016 agri agroecoregions.zip
            drwxr-xr-x 3 12110
                                            4096 May 13 2016 agri cropland data layer 2006
                                  5070
                                           23772916 May 13 2016 agri cropland data layer 2006.zip
                       1 12110
            -rw-r--r--
                                           4096 May 13 2016 agri cropland data layer 2007
                       3 12110
                                   5070
            drwxr-xr-x
                                           23806695 May 13 2016 agri cropland data layer 2007.zip
            -rw-r--r--
                       1 12110
                                            4096 Jun 29 2019 agri_cropland_data layer 2008
                       4 12110
            drwxr-xr-x
                       1 12110
                                           128608155 Jun 29 2019 agri cropland data layer 2008.zip
            -rw-r--r--
                       4 12110
                                               4096 Aug 03 2019 agri cropland data layer 2009
            drwxr-xr-x
            -rw-r--r--
                       1 12110
                                           67638120 Aug 03 2019 agri cropland data layer 2009.zip
                                              4096 May 13 2016 agri_cropland_data_layer_2010
                        1 12110
                                   5070
                                            61940443 May 13 2016 agri cropland data layer 2010.zip
            -rw-r--r--
                                                4096 May 13 2016 agri_cropland_data_layer_2011
                         3 12110
                                   5070
            drwxr-xr-x
                         1 12110
                                   5070
                                            69495706 May 13 2016 agri cropland data layer 2011.zip
            -rw-r--r--
                         3 12110
                                                4096 May 13 2016 agri cropland data layer 2012
            drwxr-xr-x
                         1 12110
                                            67758482 May 13 2016 agri cropland data layer 2012.zip
            -rw-r--r--
                         3 12110
                                   5070
                                                4096 May 13 2016 agri cropland data layer 2013
            drwxr-xr-x
                         1 12110
                                   5070
                                            68394828 May 13 2016 agri_cropland_data_layer_2013.zip
            -rw-r--r--
                                   5070
                                                4096 May 13 2016 agri cropland data layer 2014
                         3 12110
            drwxr-xr-x
                         1 12110
                                            137334649 May 13 2016 agri cropland data layer 2014.zip
            -rw-r--r--
                         3 12110
            drwxr-xr-x
                                                4096 May 13 2016 agri cropland data layer 2015
                         1 12110
            -rw-r--r--
                                            68420973 May 13 2016 agri_cropland_data_layer_2015.zip
                         4 12110
                                   5070
                                                4096 Aug 30 2019 agri_cropland_data_layer_2016
            drwxr-xr-x
                                            66038548 Aug 30 2019 agri cropland data layer 2016.zip
                        1 12110
                                   5070
            -rw-r--r--
                        4 12110
                                   5070
                                                4096 Aug 30 2019 agri_cropland_data_layer_2017
            drwxr-xr-x
                         1 12110
                                   5070
                                            64895952 Aug 30 2019 agri cropland data layer 2017.zip
            -rw-r--r--
                                                4096 Sep 05 2019 agri cropland data layer 2018
            drwxr-xr-x
                         4 12110
                                   5070
                        1 12110
                                   5070
                                            69380279 Sep 05 2019 agri_cropland_data_layer_2018.zip
            -rw-r--r--
                         4 12110
                                                4096 Mar 31 2020 agri cropland data layer 2019
            drwxr-xr-x
                         1 12110
                                   5070
                                            67423046 Mar 31 2020 agri cropland data layer 2019.zip
            -rw-r--r--
                        3 12110
                                               4096 Nov 05 2015 agri mawqcp areas
            drwxr-xr-x
                        1 12110
                                              885558 Nov 05 2015 agri mawqcp areas.zip
            -rw-r--r--
                                   5070
                         3 12110
                                               4096 Nov 05 2015 atmos 1981 2010 mn precip avg
            drwxr-xr-x
                        1 12110
                                   5070
                                              572973 Nov 05 2015 atmos 1981 2010 mn precip avg.zip
            -rw-r--r--
                        3 12110
                                   5070
                                              4096 Sep 14 2016 base mda service
            drwxr-xr-x
                        1 12110
                                   5070
                                              57872 Sep 14 2016 base mda service.zip
            -rw-r--r--
                        3 12110
                                   5070
                                               4096 Mar 12 2016 base urban areas
            drwxr-xr-x
                        1 12110
                                   5070
            -rw-r--r--
                                              435345 Mar 12 2016 base urban areas.zip
                        3 12110
                                               4096 Mar 15 2016 bdry border entities
            drwxr-xr-x
                        1 12110
                                             7202329 Mar 15 2016 bdry border entities.zip
            -rw-r--r--
                        3 12110
                                   5070
                                                4096 Dec 09 05:54 biota bmsb
            drwxr-xr-x
            -rw-r--r--
                        1 12110
                                              403284 Dec 09 05:43 biota bmsb.zip
                                               4096 Feb 20 06:01 env agchem incidents
                        3 12110
                                   5070
            drwxr-xr-x
                                            22456901 Feb 20 05:48 env agchem incidents.zip
                        1 12110
                                   5070
            -rw-r--r--
                        3 12110
                                   5070
                                                4096 Feb 20 06:02 env_emerald_ash_borer
            drwxr-xr-x
                        1 12110
                                   5070
                                            53705216 Feb 20 05:49 env emerald ash borer.zip
            -rw-r--r--
                                                4096 Feb 13 2020 env_gypsy_moth
                        3 12110
                                   5070
            drwxr-xr-x
                                              137555 Feb 13 2020 env gypsy_moth.zip
                        1 12110
                                   5070
            -rw-r--r--
                         3 12110
                                   5070
                                               4096 Sep 23 04:58 geos soil temp network
            drwxr-xr-x
                        1 12110
                                              49580 Sep 23 04:47 geos soil temp network.zip
            -rw-r--r--
            drwxr-xr-x
                         3 12110
                                               4096 Aug 30 2019 util ethanol plant locations
            -rw-r--r--
                         1 12110
                                              282470 Aug 30 2019 util ethanol plant locations.zip
                        3 12110
                                   5070
                                               4096 Jun 22 2017 water aquifer vulnerability
            drwxr-xr-x
                        1 12110
                                   5070
                                            33051697 Jun 22 2017 water aquifer vulnerability.zip
            -rw-r--r--
                        3 12110
                                   5070
                                                4096 Jan 28 06:33 water fall fert restriction 2021
            drwxr-xr-x
                                   5070
                                            267701600 Jan 28 06:09 water fall fert restriction 2021.zip
            -rw-r--r--
                       1 12110
   Out[14]: '226 Directory send OK.'
            1 with open('agri_cropland_data_layer_2019.zip', 'wb') as fp:
                   ftp.retrbinary('RETR agri_cropland_data_layer_2019.zip' , fp.write)
In [16]: 🕨
            1 from zipfile import ZipFile
            3 | # Create a ZipFile Object and load sample.zip in it
             4 | with ZipFile('agri cropland data layer 2019.zip', 'r') as zipObj:
                  # Extract all the contents of zip file in current directory
                  zipObj.extractall()
In []: | 1 from zipfile import ZipFile
            3 # Create a ZipFile Object and load sample.zip in it
            4 with ZipFile('PRISM ppt 30yr normal 4kmM2 annual bil.zip', 'r') as zipObj:
             5 # Extract all the contents of zip file in current directory
             6 zipObj.extractall()
In []: M 1
```

Logout

jupyter Lab2Part2_CostSurf (unsaved changes)