Directory Structures and changing directories

We quickly learned that no one has done much command line programming. Back in the day.......
(But that just dates me...)

But we need to understand some command line work and how a computer is set up to make our
life easier. We don't need to know much yet. But we need to know how to move around
directories. when programming I usually find it easier to program in the directory I have things
saved and to use relative directories. This will make sense in a second. So here are a few lines of
code in order to show a directory structure. Lets look and then practice.....

The easiest way to avoid directories is to go to the directory you are working in and open your
iPython notebook from there. But sometimes you can't do that. But we can use some linux or
dos commands to move around

If you want to know the path to your current directory type pwd

Your answers will look different than mine. So don't freak out. Take your time and this will make sense

Today's goals

- Become more comfortable with directories
- work in different directories
- know absolute and relative paths

Some common nomenclature

- pwd - tells you the path or directory you are in
- ls - lists everything in that folder or directory you are in
- cd - change directory. Lets you change a directory
    - cd name changes directory into that folder
    - cd .. moves you up a directory
    - cd / moves you to root or the top of all your folders

Now Typing pwd shows you the path of where you are working

```
In [22]:    pwd
```

```
Out[22]:    'C:\\work-teaching\\python\\fall18\\BigDataPython'
```

If you want to know what is in your directory type list or "ls" on a mac or "dir" on a pc

```
In [23]:    ls
```

```
Volume in drive C is Windows
Volume Serial Number is 5E50-87CB

Directory of C:\work-teaching\python\fall18\BigDataPython
```

```
09/03/2018  02:43 PM    <DIR>          .
09/03/2018  02:43 PM    <DIR>          ..
08/30/2018  09:57 AM    <DIR>          .git
08/30/2018  09:57 AM    <DIR>          .ipynb_checkpoints
10/17/2017  09:57 PM               171 ~$Species-Arsenic-Data.xlsx
09/16/2005  09:05 PM           192,305 127_2800.JPG
04/15/2015  05:22 PM           169,375 128.png
09/16/2005  09:05 PM           216,200 128_2801.JPG
01/28/2015  10:32 PM               814 addition.html
01/28/2015  06:04 PM               100 addition.txt
01/28/2015  10:37 PM               667 addition1.html
01/29/2015  10:17 AM               569 addition-1to50.html
10/15/2015  01:05 PM           153,511 Arctic_Shrub_Christa.xlsx
02/24/2015  10:37 AM            20,280 array-axes.png
10/13/2015  09:47 AM           133,993 As-corr.pdf
10/15/2015  03:39 PM            67,017 As-corr14.png
10/17/2017  09:42 PM           133,993 As-corr2.pdf
10/13/2015  10:19 AM            66,118 As-corr4.png
03/05/2015  04:01 PM            94,685 As-corr-4.png
10/17/2017  09:53 PM            96,264 As-corr6.png
08/11/2015  04:30 PM                 0 bad-Fit a line answers.ipynb
08/31/2015  01:25 PM            88,992 bad-FitALine.ipynb
12/20/2017  01:01 PM         8,109,922 BarnardTree.html
11/22/2016  01:23 PM           113,976 basic_animation.mp4
11/12/2017  11:09 PM            12,693 BloodLeadData.xlsx
11/12/2017  11:29 PM            13,247 BloodLeadDataStateFolium.xlsx
11/12/2017  10:40 PM           657,143 BloodLeadNTA.html
10/11/2016  12:11 PM            53,847 boxplot_structure.png
10/10/2016  09:09 AM             3,139 Brian!.png
10/10/2016  09:09 AM             1,380 Brian.csv
10/10/2016  09:10 AM             6,168 brianhw.ipynb
11/12/2017  10:36 PM           495,917 brooklynLocations.html
11/12/2017  09:45 PM            48,875 BrooklynPublicLead.xlsx
11/11/2015  09:55 AM            16,225 Cartopy.docx
03/25/2015  10:29 PM           203,178 cartopy-extras.ipynb
08/30/2018  09:57 AM    <DIR>          cb_2016_us_cd115_5m
08/30/2018  09:57 AM    <DIR>          cb_2016_us_state_5m
01/22/2015  06:29 PM         4,093,009 central_park.csv
10/22/2015  08:49 AM            61,510 central_park_core.jpg
01/21/2016  06:16 AM           283,904 check_for_correlations.ipynb
10/20/2015  10:47 AM           312,364 Chillrud-Abstract.png
10/19/2015  04:20 PM            84,555 Chillrud-es9807892.pdf
10/19/2015  04:24 PM           111,179 Chillrud-es9807892_Page_1.png
10/19/2015  04:24 PM           205,754 Chillrud-es9807892_Page_2.png
10/19/2015  04:24 PM           169,148 Chillrud-es9807892_Page_3.png
10/19/2015  04:24 PM           140,387 Chillrud-es9807892_Page_4.png
10/19/2015  04:24 PM           106,436 Chillrud-es9807892_Page_5.png
10/19/2015  04:24 PM            26,296 Chillrud-es9807892_Page_6.png
04/15/2015  05:32 PM         1,442,071 china.gif
10/20/2016  11:00 AM           533,710 christa.pdf
10/21/2015  12:09 PM             4,573 Christa_axis_names.ipynb
10/20/2016  11:10 AM           290,679 Christa_thesis.ipynb
10/20/2016  11:08 AM            52,161 christa-4.png
10/20/2016  11:08 AM            70,384 christa-6.png
10/23/2015  01:01 PM            25,338 co2-2000-diff.png
10/23/2015  01:01 PM            36,674 co2-diff.png
10/23/2015  01:01 PM            10,768 co2-monthly-diff.png
11/10/2017  04:49 PM            12,920 CO2Stations.xlsx
11/03/2017  09:37 AM         7,498,981 convert.json
10/20/2015  10:55 AM             1,642 CoreEM09GC01.csv
11/02/2015  10:34 AM             1,661 CoreEM09GC01-extra-line.csv
08/30/2018  09:57 AM    <DIR>          directories
01/23/2015  05:28 PM           966,364 directory-structure.html
09/03/2018  02:43 PM           775,848 directory-structure.ipynb
```

```
03/24/2015  04:03 PM          5,998,832 EM09-GC-01_comp.jpg
10/28/2015  05:10 PM            106,895 EM09-GC01-Cropped.jpg
03/04/2015  02:59 PM             90,615 enumerate.ipynb
09/20/2017  05:25 PM             17,738 equationofline.ipynb
09/20/2017  05:17 PM             17,738 equationofline_v2.ipynb
09/25/2017  11:13 AM             37,465 equationofline-answer.ipynb
10/14/2016  04:53 PM             42,402 File-3D_Vector.svg
10/12/2015  04:43 PM             15,973 filetest.pdf
03/04/2015  11:00 AM             21,955 filetest3.pdf
10/12/2015  04:46 PM            136,975 filetest4.pdf
11/12/2017  11:43 PM              5,823 FirstMap.html
11/19/2017  05:11 PM             74,744 FirstTrySST.png
09/29/2017  01:42 PM             57,933 Fit a line answers.ipynb
10/02/2017  09:01 AM            117,882 FitALine.ipynb
03/19/2015  12:38 PM             64,749 fldav_ljo.csv
10/05/2017  12:53 PM              4,709 for-loop-HW.ipynb
09/23/2017  01:30 PM             46,303 for-loops.ipynb
02/13/2015  04:23 PM              2,180 gdp.csv
08/31/2015  02:26 PM              2,180 gdp_and_lifespan.csv
02/12/2015  04:46 PM              4,841 GDP_Lifespan_all_data.csv
08/31/2015  02:29 PM              1,125 gdp_only.csv
08/31/2015  02:26 PM              2,180 gdp2 - Copy.csv
08/31/2015  02:26 PM              2,180 gdp2.csv
08/11/2015  04:28 PM              1,999 gdp2015.csv
02/12/2015  04:46 PM              4,841 GDP-Lifespan - Copy.csv
02/12/2015  04:46 PM              4,841 GDP-Lifespan.csv
08/30/2018  09:57 AM    <DIR>          gif
03/25/2015  05:39 PM            112,257 globe.jpg
08/30/2018  09:57 AM    <DIR>          grading_rubrics
11/29/2016  05:55 PM             55,614 groupby.ipynb
11/29/2016  04:51 PM              9,931 groupby.xlsx
11/01/2017  09:18 AM          3,436,530 gz_2010_us_050_00_20m.json
09/24/2015  03:52 PM         15,097,040 Harris-fit-a-line.pdf
01/16/2015  03:42 PM              3,142 hw2-picture.png
08/30/2018  09:57 AM    <DIR>          icec
11/19/2017  03:16 PM         72,210,029 icec.day.mean.2016.v2.nc
09/26/2017  06:15 PM            100,259 ifelif.ipynb
09/25/2017  09:14 PM             13,391 ifelif-lga-jfk-answer.ipynb
08/11/2015  04:30 PM                  0 ifelif-lga-jfk-answer-bad.ipynb
10/14/2016  04:56 PM              1,221 ijk.gif
08/30/2018  09:57 AM    <DIR>          images
01/23/2015  05:28 PM            240,077 intro-to-python-types-print-lists.html
09/13/2017  11:21 AM             31,982 intro-to-python-types-print-lists.ipynb
12/19/2015  10:01 AM             20,135 jps2192_hw12.ipynb
11/05/2015  11:05 AM             58,494 latitude-longitude.jpg
11/06/2017  11:11 AM              5,082 lead.html
11/12/2017  09:14 PM              5,652 LeadPublic.html
11/12/2017  09:14 PM              5,652 LFirstMap.html
03/04/2015  10:38 PM             45,389 libby.png
03/05/2015  02:44 PM            110,086 libby.svg
03/05/2015  04:43 PM            163,756 libby_thesis.ipynb
03/07/2015  04:01 PM             16,753 Libby_Thesis_Data.csv
10/15/2015  09:42 AM            162,712 libby_thesis-Copy1.ipynb
03/05/2015  12:29 PM             59,728 libby2.pdf
03/05/2015  04:42 PM             45,683 libby-4.png
03/05/2015  04:43 PM             66,755 libby-6.png
03/02/2015  11:11 PM            151,796 lin1.pdf
09/14/2017  10:20 AM              5,679 line_styles_reference.png
09/20/2017  08:53 AM             16,485 lists.ipynb
01/23/2015  05:28 PM            276,129 make-a-list-plot-it.html
09/20/2017  08:54 AM            197,794 make-a-list-plot-it.ipynb
10/31/2017  02:08 PM          5,643,471 mapping_v1.ipynb
10/31/2017  02:07 PM          5,643,471 mapping_v1-Copy1.ipynb
11/21/2017  01:55 PM         12,305,332 mapping_v2-2017.ipynb
11/12/2017  10:41 PM          9,225,170 mapping_v2-2017-Copy1.ipynb
```

```
11/12/2017  07:23 PM               175,804 MappingHW2017_v1.ipynb
10/31/2017  09:42 AM               105,038 MLO-Bonus-BoxModel.ipynb
02/04/2016  08:14 AM                99,961 MLO-Bonus-BoxModel-Answers.ipynb
10/05/2017  12:15 PM               242,591 more-line-fit.ipynb
10/03/2016  09:02 AM                96,595 more-line-fit-GDP-answers.ipynb
10/01/2016  09:19 AM               208,126 more-line-fit-old-with-poly1d.ipynb
02/28/2015  04:47 PM               146,851 multipage4.pdf
02/24/2015  02:04 PM                37,289 mystery.csv
11/19/2017  09:56 PM             1,245,566 netcdf-hw.ipynb
11/20/2017  09:49 AM               595,449 netcdf-v1.ipynb
04/24/2018  09:46 AM               202,918 NYC-School-Lead.ipynb
10/14/2016  04:47 PM                73,603 Pandaborg.jpg
02/28/2015  11:49 AM               112,729 pandas_hw_scatter_plot.ipynb
10/11/2017  08:57 AM               388,499 Pandas_Well_Data.ipynb
03/11/2015  10:08 AM               485,825 pandas_well_data_cut.ipynb
10/17/2017  09:41 PM             1,169,979 pandas_well_data_part2.ipynb
10/04/2015  05:32 PM               423,840 pandas_well_data_part3.ipynb
03/02/2015  11:14 PM               491,186 pandas_well_data_part4.ipynb
04/15/2015  05:23 PM             1,201,433 pandas-china-air.ipynb
11/11/2017  06:57 PM             1,178,733 pandas-correlations.ipynb
08/30/2018  09:57 AM    <DIR>              pandas-correlations.ipynb1k9g48
11/06/2017  04:37 PM               283,825 pandas-mauna-lao.ipynb
10/18/2016  12:13 PM             1,753,449 pandas-related.jpg
10/31/2017  11:45 AM               511,774 pandastimeseries.ipynb
10/20/2016  11:23 AM               112,633 pandas-unit-convert.ipynb
10/14/2016  04:47 PM               155,287 PeterPanda2-phineas-pherb.jpg
10/24/2017  10:53 AM            10,061,715 plotcoredata.ipynb
10/27/2017  11:45 AM               475,701 plotcoredata_answer.ipynb
09/20/2016  12:10 PM                23,724 Plot-HW.ipynb
11/19/2017  05:19 PM            35,212,696 PolarSeaIce-ezgif.com-gif-maker.gif
11/06/2017  11:10 AM             8,011,881 pyshp-demo.json
01/22/2015  06:29 PM                 4,201 python.jpg
10/01/2015  03:28 PM                 1,723 random-numbers.ipynb
09/21/2016  11:14 AM               151,351 range-linspace.ipynb
01/22/2015  06:29 PM                   122 README.md
11/03/2017  11:42 AM             3,299,727 schoolDistricts.json
09/17/2005  10:34 AM               187,843 Seawolf.JPG
09/20/2016  11:34 AM                26,926 SineAndB.jpg
10/19/2016  09:18 AM                37,636 Species-Arsenic-Data.xlsx
08/30/2018  09:57 AM    <DIR>              sst
11/15/2016  12:27 PM           474,352,740 sst.day.mean.2014.v2.nc
11/16/2015  05:47 PM           416,131,525 sst.day.mean.2015.v2.nc
11/19/2017  09:58 PM            18,304,578 sst-2014-ezgif.com-gif-maker.gif
10/14/2016  04:57 PM                19,495 standard_unit_vectors_3d.png
11/12/2017  11:31 PM             2,209,819 states.html
01/26/2015  11:14 AM                 2,759 stringhw.ipynb
09/14/2017  02:08 PM                11,428 strings.ipynb
11/12/2017  07:19 PM                13,121 summary_2015CO2State.xlsx
11/06/2017  10:42 AM             3,487,715 testScores.html
11/12/2017  10:41 PM             9,225,170 This has the NTA Lead Map.ipynb
01/23/2015  05:28 PM               443,034 time-series-first-analysis_v2.html
09/03/2018  01:17 PM               208,363 time-series-first-analysis_v2.ipynb
01/30/2015  02:44 PM                   281 try-except.ipynb
02/23/2015  10:49 PM                   102 twoD1.csv
10/05/2017  11:36 AM               429,350 TwoDArrays.ipynb
08/10/2015  03:04 PM                 9,256 Untitled.ipynb
11/20/2016  09:26 PM             1,315,318 Untitled1.ipynb
10/15/2017  10:38 PM                18,530 Untitled2.ipynb
08/30/2018  09:57 AM    <DIR>              uploadMe
10/31/2017  04:57 PM                89,263 us-states.json
03/27/2015  09:58 AM                53,449 weekly_mlo.csv
10/09/2015  11:37 AM                78,886 well_data.csv
03/26/2015  03:27 PM                   128 well_sites.csv
02/27/2015  04:09 PM                 2,589 Well-As.csv
01/28/2015  10:38 PM                14,896 worksheets.ipynb
```

```
08/30/2018   09:57 AM    <DIR>          zips
02/14/2014   10:01 AM         3,194,354 zips.json
11/01/2017   09:06 AM           671,409 zips.zip
             182 File(s)  1,160,198,642 bytes
              15 Dir(s)  274,611,818,496 bytes free
```

We can move up a directory using cd ..

In [24]:
```
cd ..
```

C:\work-teaching\python\fall18

In [25]:
```
ls
```

```
 Volume in drive C is Windows
 Volume Serial Number is 5E50-87CB

 Directory of C:\work-teaching\python\fall18

08/30/2018   09:58 AM    <DIR>          .
08/30/2018   09:58 AM    <DIR>          ..
08/30/2018   09:57 AM    <DIR>          arsenic
08/30/2018   09:57 AM    <DIR>          bakker
05/18/2015   11:09 AM           272,677 Barnard_-_Lecture-Se_May_18__2015.pdf
08/30/2018   09:57 AM    <DIR>          basic-python
09/03/2018   02:43 PM    <DIR>          BigDataPython
08/30/2018   09:57 AM    <DIR>          BigDataPython-old
02/24/2015   04:11 PM            10,849 Brian.png
08/30/2018   09:57 AM    <DIR>          central-park
10/03/2014   10:13 AM           224,821 code-acadepy-python-part1.pdf
06/03/2014   09:48 AM           312,629 computationalpython_ipython.pdf
08/30/2018   09:57 AM    <DIR>          figures
08/30/2018   09:57 AM    <DIR>          grades
08/30/2018   09:57 AM    <DIR>          Homeworks
11/05/2015   12:52 PM           234,397 latitude-longitude.pptx
08/30/2018   09:57 AM    <DIR>          libby
09/19/2014   01:29 PM            90,464 map
03/25/2015   10:13 PM             1,248 map addresses for class 2015-40df218c02fc
copy.txt
09/19/2014   01:29 PM            90,464 map.png
09/17/2014   08:25 PM            14,906 myfirstpythonfigure.pdf
08/30/2018   09:57 AM    <DIR>          netcdf-old
08/30/2018   09:57 AM    <DIR>          New folder
08/13/2017   08:15 PM    <DIR>          New folder (2)
08/30/2018   09:57 AM    <DIR>          poster-session
10/03/2017   11:01 AM         1,317,920 p-values-s41562-017-0189-z.pdf
01/19/2015   12:02 PM            16,859 Python how to.docx
06/03/2014   09:48 AM           343,040 Re  python.msg
09/03/2018   01:54 PM    <DIR>          ScreenFlow Videos
08/30/2018   09:58 AM    <DIR>          shortcourse
09/02/2018   06:49 PM    <DIR>          syllabus
08/30/2018   09:58 AM    <DIR>          temp-for-print
10/12/2015   08:54 AM           160,036 What Really Keeps Women Out of Tech - The
New York Times.pdf
01/29/2015   11:17 AM            17,101 worksheets.ipynb
08/30/2018   09:58 AM    <DIR>          worldprecip
              14 File(s)      3,107,411 bytes
              21 Dir(s)  274,611,818,496 bytes free
```

now you can move down a directory. Tab complete will help you.

In [26]:
```
cd BigDataPython/
```

C:\work-teaching\python\fall18\BigDataPython

we can move to root (root is the main directory and I think it is called root after a tree..

In [27]:
```
cd /
```
C:\

now we can copy and paste and move all the way back. Having no spaces in you file and folder names makes life simpler

In [30]:
```
cd C:\\work-teaching\\python\\fall18\\BigDataPython
```
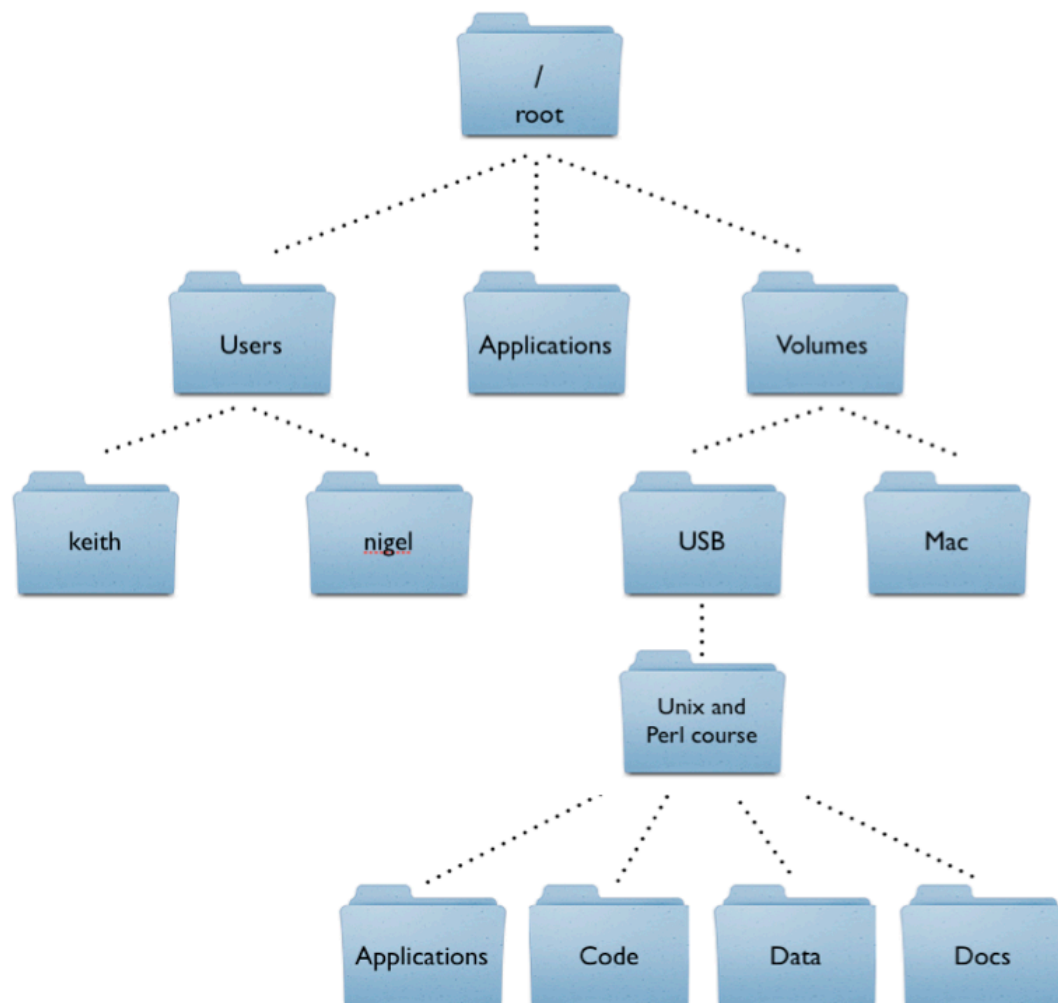C:\work-teaching\python\fall18\BigDataPython

In [31]:
```
pwd
```

Out[31]:   'C:\\work-teaching\\python\\fall18\\BigDataPython'

Now I am going to show a picture below to show you what the directory structure looks like on a mac and then on a pc. But also look at the code and this is how you add an image using ipython! I turned on or imported the display library and then we are using it. This won't work for you yet because you don't have that image. I will show you how to add images later
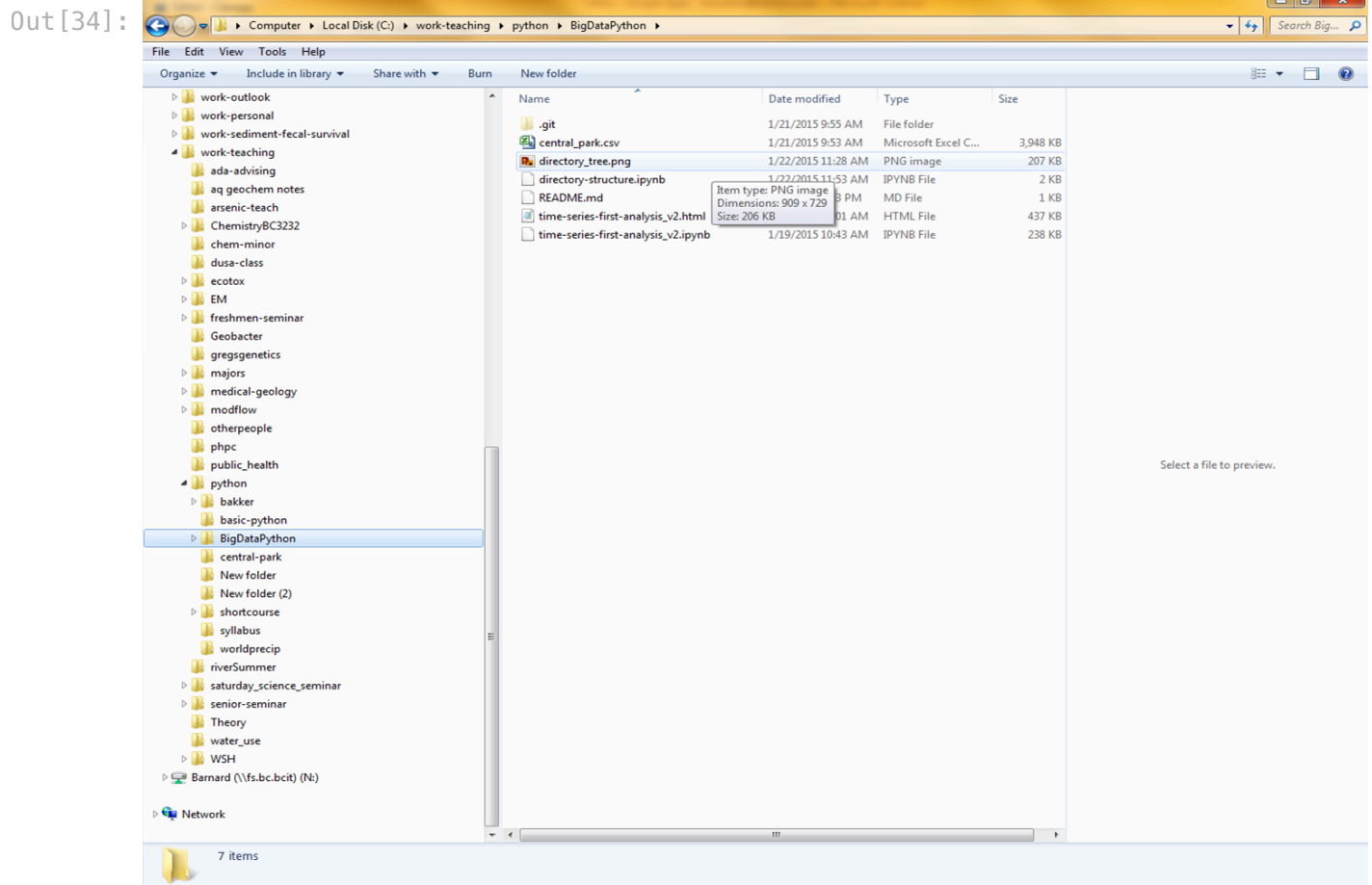
In [32]:
```
from IPython.display import Image
```

In [33]:
```
Image(filename='directories/directory_tree.png')
```

Out[33]:

```
In [34]:   Image(filename='directories/folder-structure-home-comp.png')
```

Out[34]:

Let's see if this all makes sense...

Your goal should be able to download a photo and then move to the correct directory and open it. You could also open them with an absolute path! As I did for the python image. Absolute paths can get you in trouble if you move folders around so i try to keep things with relative paths.

Image(filename='/work-teaching/python/fall18/BigDataPython/python.jpg')

can you download an image from the web and show it? Here is a webpage that gives you a lot of information about making ipython notebooks look good!
http://nbviewer.ipython.org/github/adrn/ipython/blob/1.x/examples/notebooks/Part%205%20-%20Rich%20Display%20System.ipynb

Add something about Directory and organizing a computer and delete the mkdir

You can also make a new directory if you need it with mkdir

```
In [45]:   mkdir "space space"
```

I added the quotes because I had white space in the name. Now that you are coding I would remove white space from names. It keeps life simple. Make sure you are comfortable moving around and getting to the usb key. What images are you going to load?

Finally if you want to learn about

\ backslashes

and

/ forward slashes

go here https://pc.net/helpcenter/answers/backslash_vs_forward_slash

Some thoughts

- I never make a directory in Python
- I know where I am working
- I open my notebook from that directory
- I save files I need into that directory
- I use the Mac Finder or Windows Explorer to make new directories as needed.
- On a Mac I like to see my harddrive on the desktop. THIS REALLY HELPS! You can turn this option on by going to Finder->Preferences and then making sure the hard drive box is checked.

Before going forward!

- You need to turn to a neighbor
- Tell the neighbor what directory you are working in and where you will store files this semester

In [ ]: