Getting Started Accessing Statistical Software Inside the U Iowa Virtual Desktop
(i.e., how to freely access SAS, STATA, or R for use on-campus or off-campus)

Step 1a. You will need to have already configured **two-factor authentication** using Duo Security for your university accounts. Instructions are here: https://its.uiowa.edu/duo

Step 1b. If you are off-campus, you will need to have the U Iowa **VPN** running in the background. You can download the program and instructions here: https://its.uiowa.edu/vpn

> When the window pops us for you to log into the VPN program (Cisco AnyConnect), you will enter your HawkID name and password as usual.

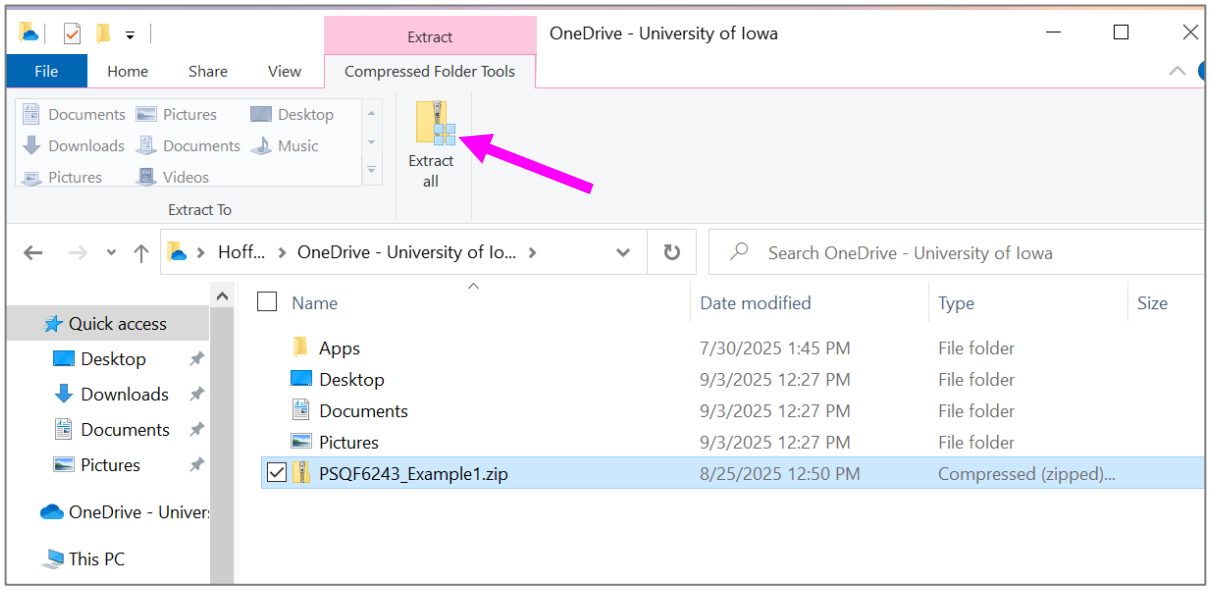
Step 1c. If you are on-campus, you will need to be connected to the eduroam U Iowa network. To do so, your username is your **HawkID@uiowa.edu** (i.e., it is a combination of your HawkID name with an email-address-like ending, but it's not your actual email address).

Step 2a. Download the Example 1 files from here:
https://www.lesahoffman.com/PSQF6243/PSQF6243_Example1.zip

> The Example1 folder includes an Excel data file (.xlsx extension), program syntax files (as .sas for SAS, .do for STATA, .and .R for R), and output files so you can see what each program does (as .rtf for SAS, .log for STATA, and .txt for R). Plots from both R and STATA are also saved in separate .png files; the plots are embedded in the SAS .rtf output already.

It may be easiest if you store your files in your university OneDrive (as I demonstrate below). However, any folder on your local computer can also be used, so long as you can navigate to it.

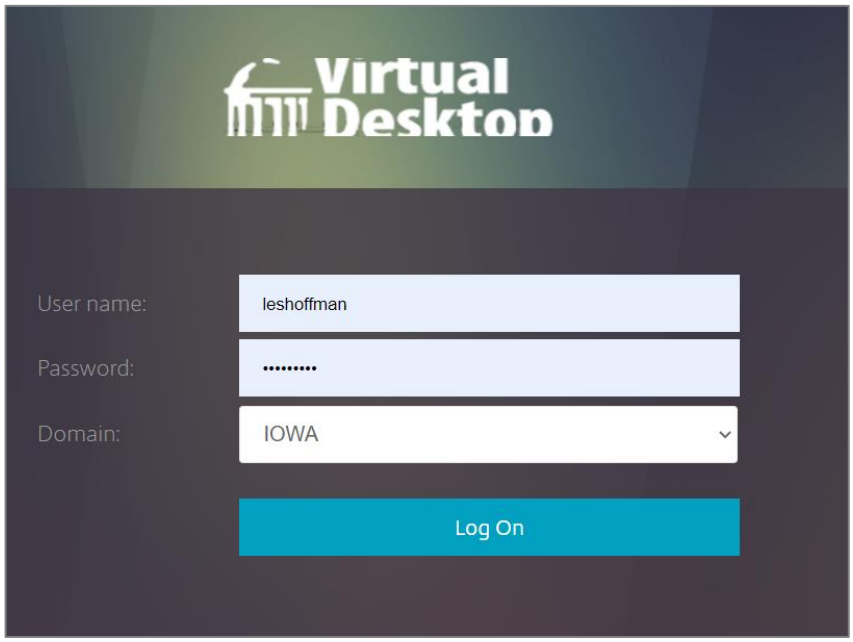
Step 2b. The files must be **extracted before use**, a command you can access from the toolbar (as shown by the arrow below) or by right-clicking on the folder and selecting "extract all":



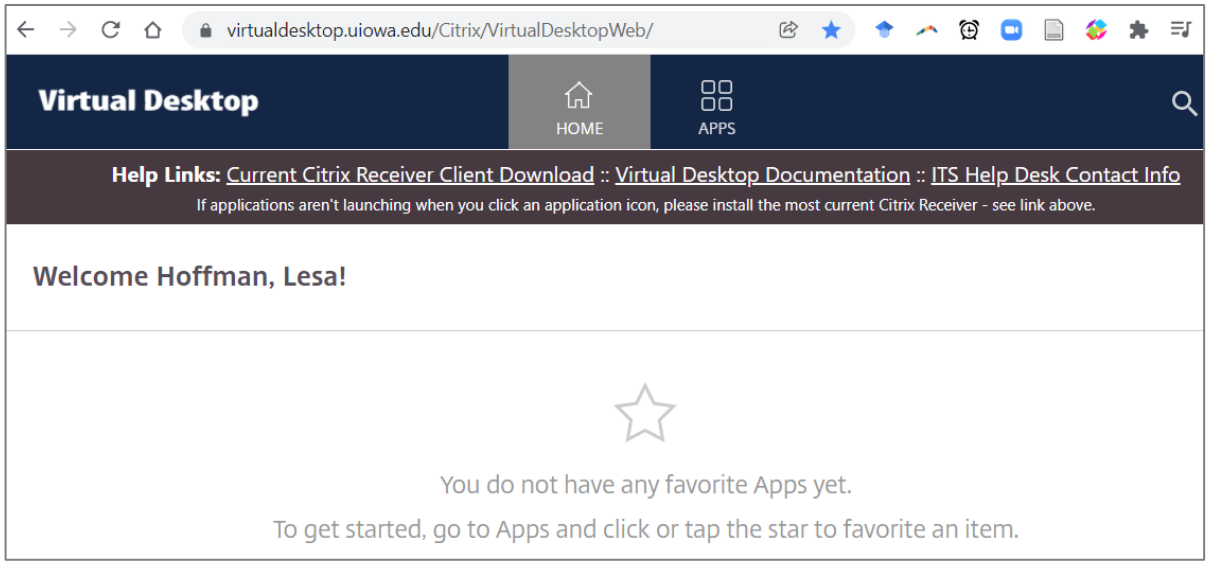
Step 3a. After completing steps 1–2, you can access the U Iowa Virtual Desktop login from this page: https://its.uiowa.edu/virtualdesktop

If you have not already downloaded and installed the Citrix Workspace program that runs the Virtual Desktop, it will prompt you do so. If you haven't used it in a while, update it to the current version.

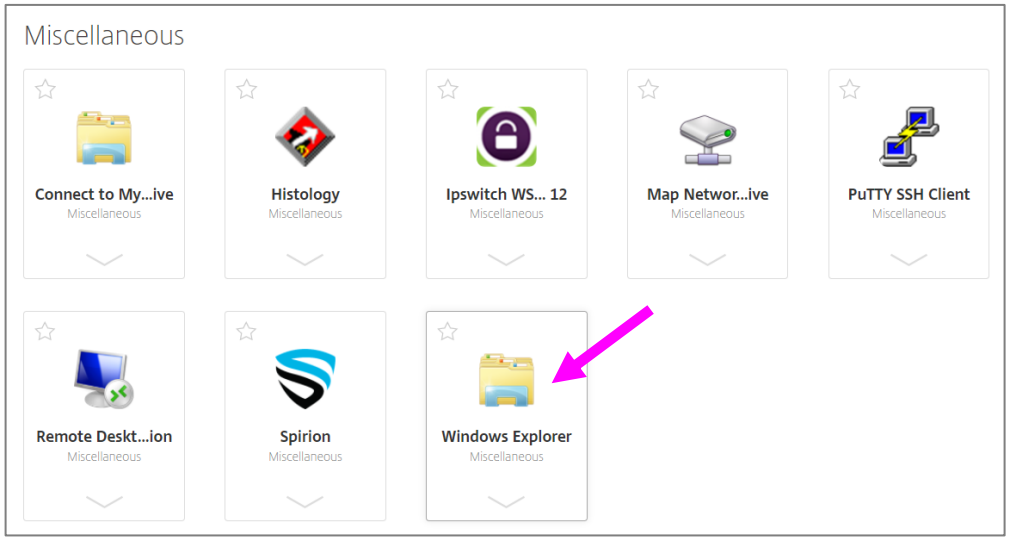
Once the Citrix program is installed, you can open it and a log-in box will appear. Enter your HawkID name and usual password for the domain IOWA as shown below:



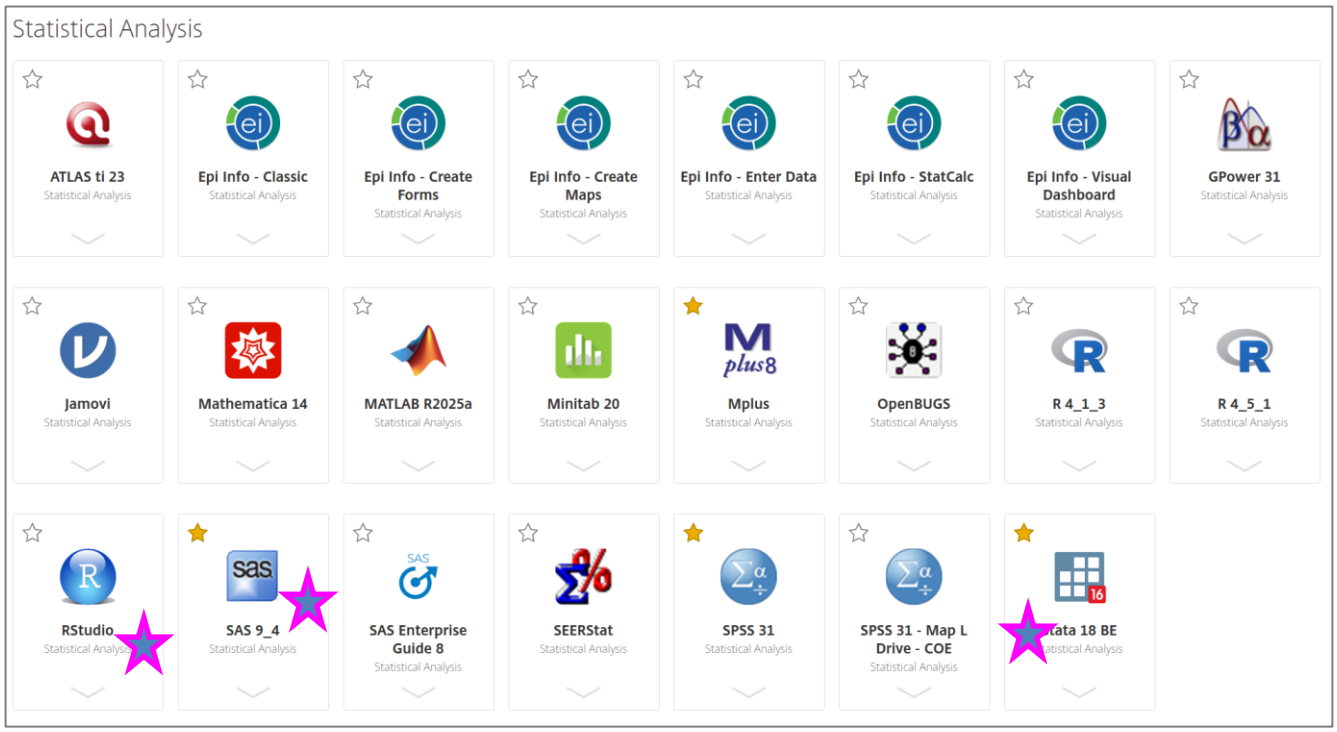
Once logged in, the front page will look something like this (if you haven't used it before):



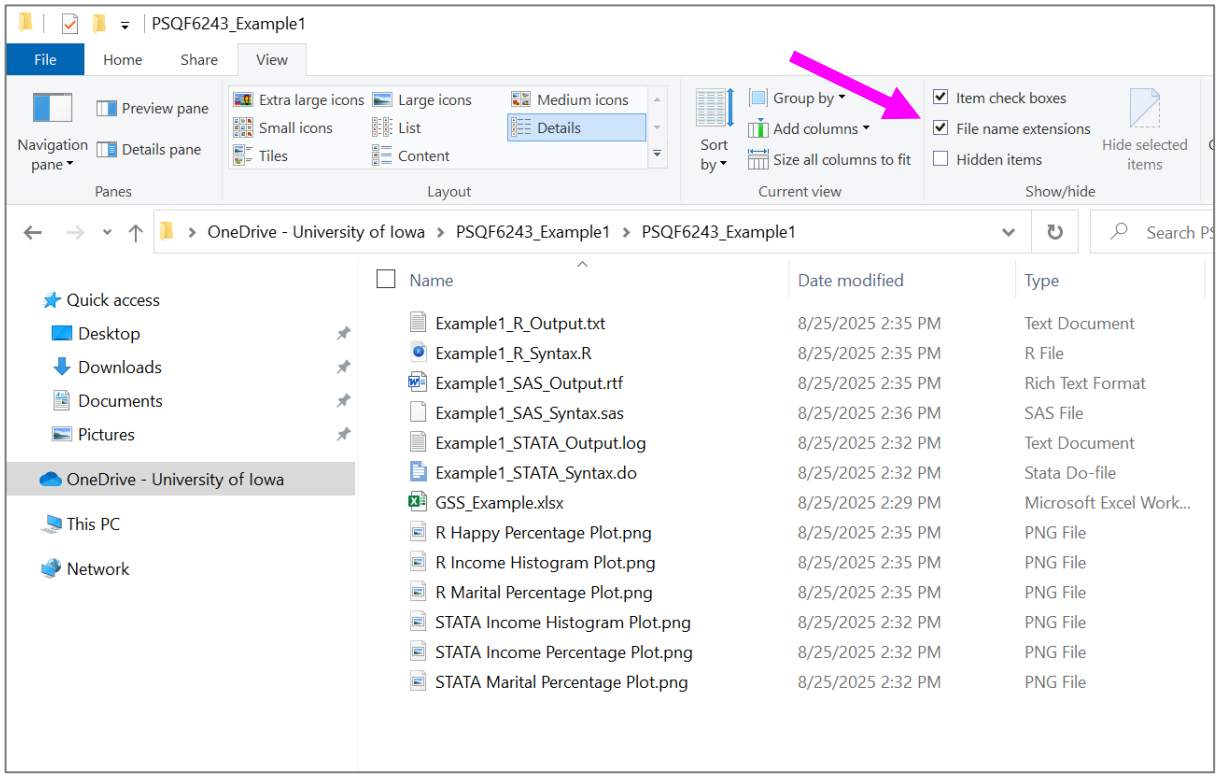
Step 3b. Go to **APPS → Categories → Miscellaneous**. You will find **Windows Explorer** (highlighted by the arrow below) which will be critically useful in telling Virtual Desktop how to access your files. Click the down arrow on the program, and then click on the star next to "add to favorites" and it will be saved to your home screen.



Step 3c. Go to **APPS → Categories → Statistical Analysis**. There you will find the programs we will need: **SAS 9_4**, **Stata 18 BE**, or **RStudio** (as highlighted by the pink stars below). For each, click the down arrow on the program, and then click on the star next to "add to favorites" and it will be saved to your home screen (as indicated by the yellow stars within each icon below).



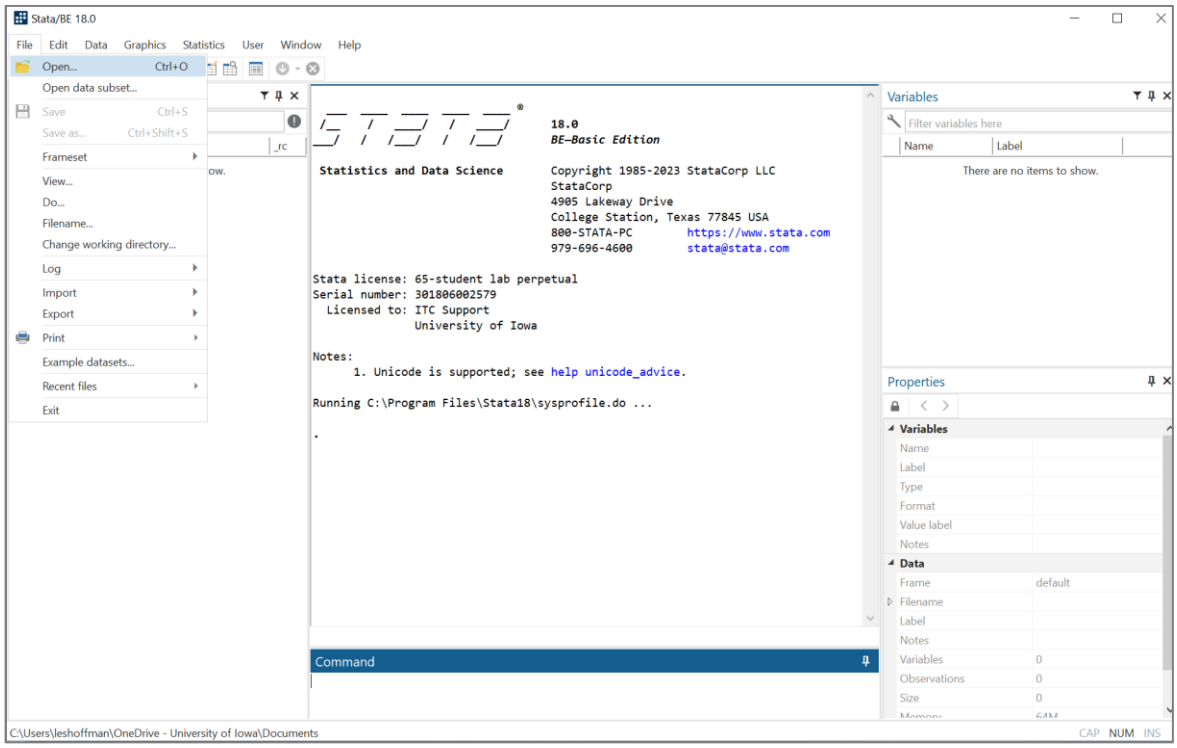
Step 4. Open Windows Explorer from inside the Virtual Desktop (i.e., NOT the same program on your local computer) by clicking on its icon. **Navigate to the folder that has your Example 1 files**, either using the tree structure on the left or the drill-down menu at the top. For example, below is my folder in my university OneDrive. Under **View**, check the box for **File name extensions** (as shown by the pink arrow) to make it easier to see your file types.



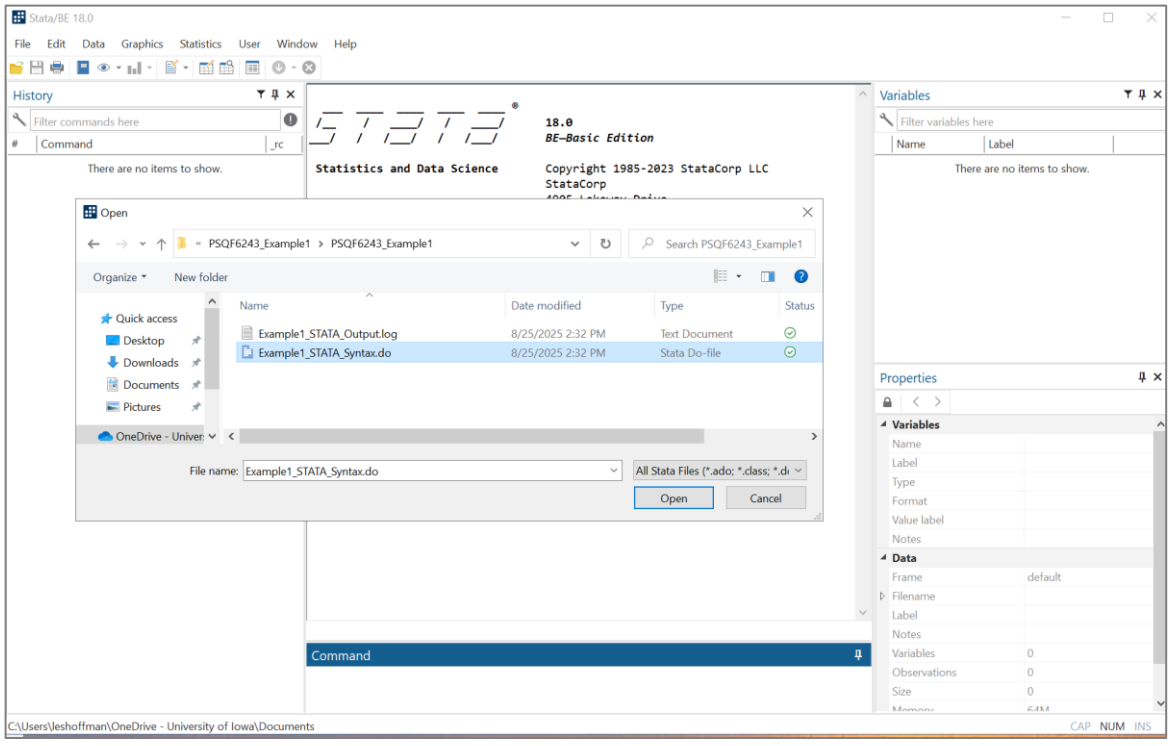
Note that by default when you extract .zipped files, it puts a subfolder of the same name inside the folder! Once you are inside the folder, **put your cursor into the top address bar**, and it will collapse into a **link that can be copied** to your clipboard. Here is mine (note the redundant nested folder names that are created by default when you extract files from a .zip folder):

C:\Users\leshoffman\OneDrive - University of Iowa\PSQF6243_Example1\PSQF6243_Example1

Step 5a for STATA. From the original **Virtual Desktop** page, **open Stata 18 BE**.
On the **File** menu, select **Open**:



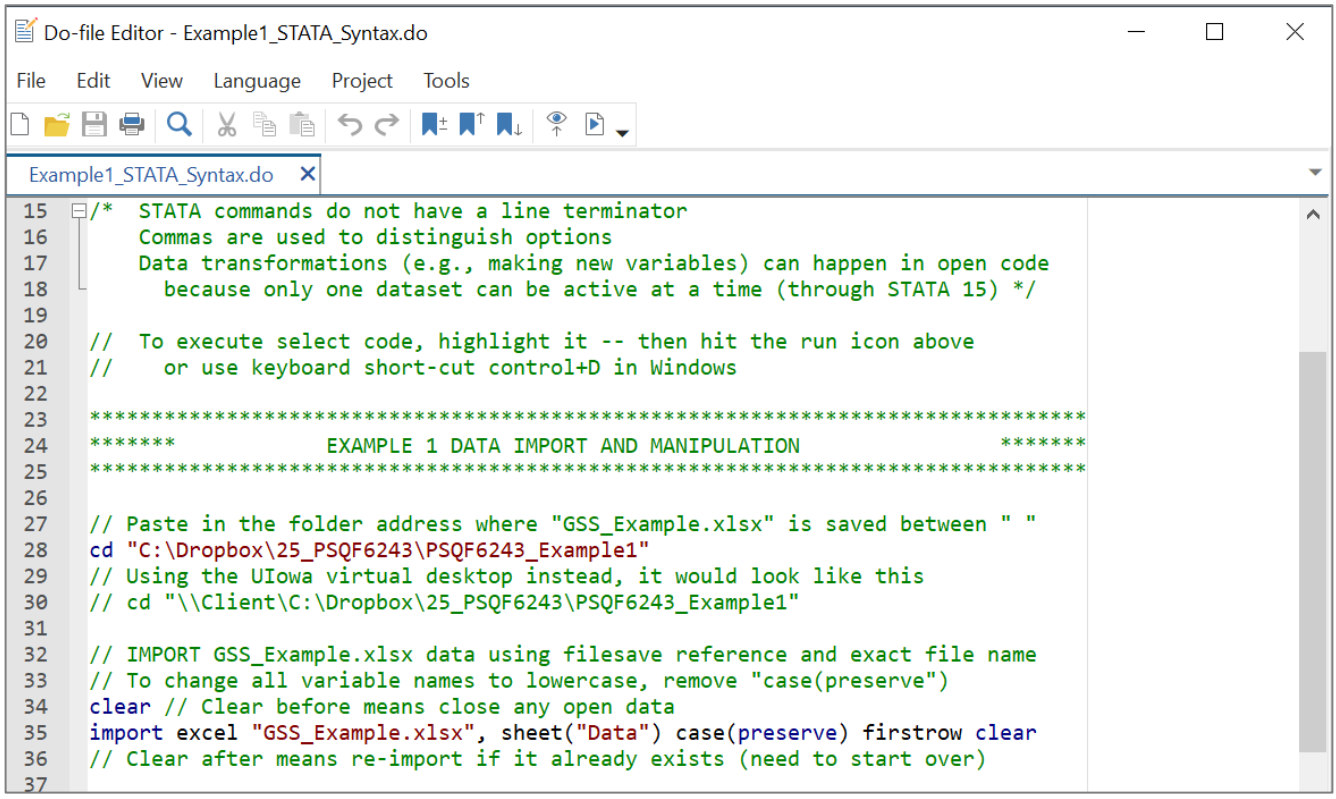
Change the bottom-right menu to **All Stata Files** and navigate to your **Example1_STATA_Syntax.do** file to open it. The menu should look like this:



Step 5b for STATA. A new syntax window should have opened separately from the previous STATA program window. **Scroll to line 28** where it says

```
cd "C:\Dropbox\25_PSQF6243\PSQF6243_Example1"
```

It should look like this:



This was where *MY* files were originally when I created this example. To change it, **paste in the path (within the quotes) that you found from Windows Explorer in Step 4**—this will tell STATA where the folder is that contains the data file to be used. The path for my university OneDrive folder looks like this:

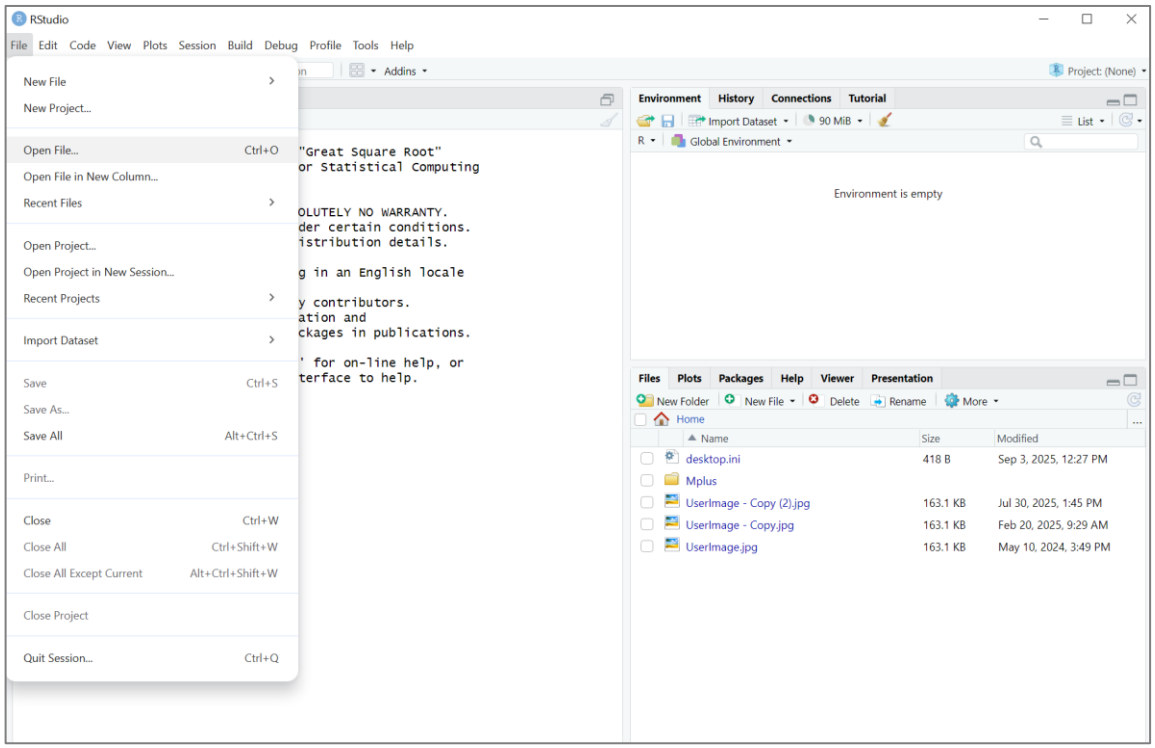
```
cd " C:\Users\leshoffman\OneDrive - University of
Iowa\PSQF6243_Example1\PSQF6243_Example1"
```

Here are some more examples of what that path would look like using different operating systems and folder locations, assuming your folder is called “PSQF6243_Example1”:

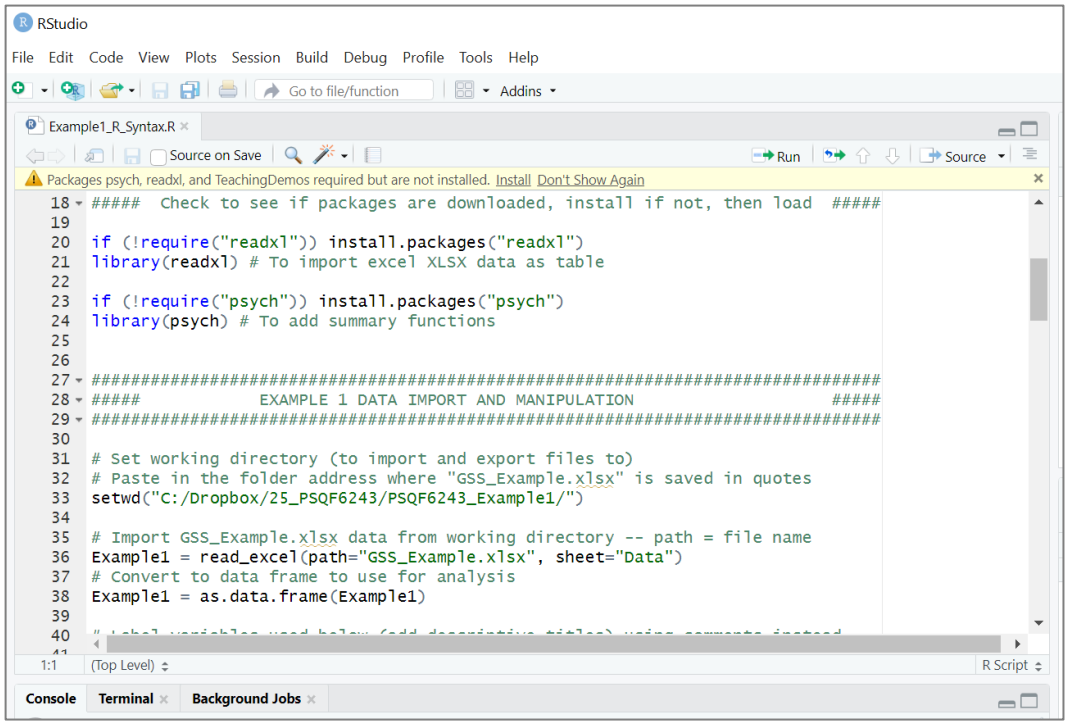
```
// Windows example using UIowa Virtual Desktop on a local drive
   cd "\\Client\C:\Dropbox\PSQF6242_Example1"

// Mac example using UIowa Virtual Desktop on a local drive
   cd "\\Client\C:/Users/username/Desktop/PSQF6243_Example1"
```

Step 5a for R. From the original **Virtual Desktop** page, **open Rstudio** (not R by itself). If prompted, allow it to use your machine's default 64-bit version of R. On the **File** menu, select **Open File**:



Step 5b for R. Navigate to your **Example1_R_Syntax.R** file and open it. Scroll down to **line 33**. The screen should look like this, with a new syntax window in the upper-left corner:



On line 33 it says: **`setwd("C:/Dropbox/25_PSQF6243/PSQF6243_Example1/")`**

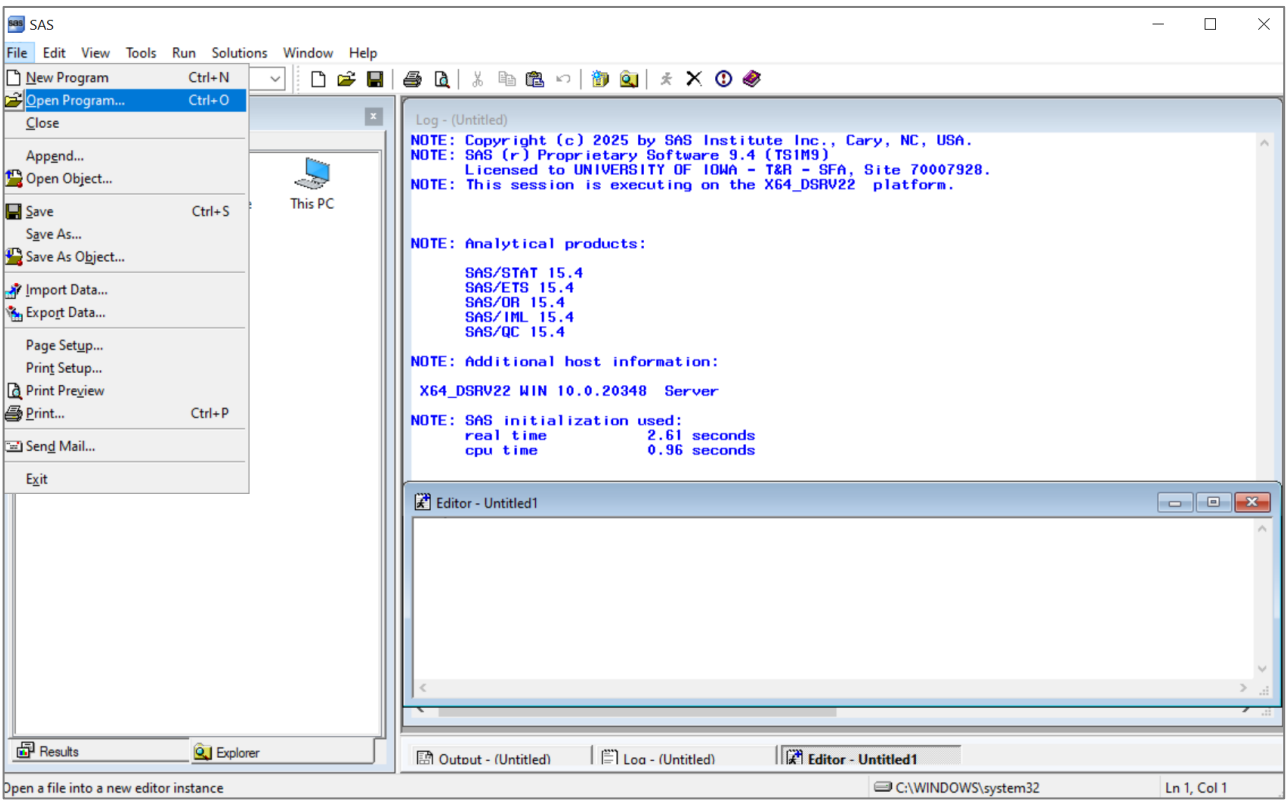
This was where *MY* files were originally when I created this example. To change it, **paste in the path (within the quotes) that you found from Windows Explorer in Step 4**—this will tell STATA where the folder is that contains the data file to be used. One catch is that you must **turn the slashes around in Windows**. The path for my university OneDrive folder looks like this originally:

`C:\Users\leshoffman\OneDrive - University of Iowa\PSQF6243_Example1\PSQF6243_Example1`

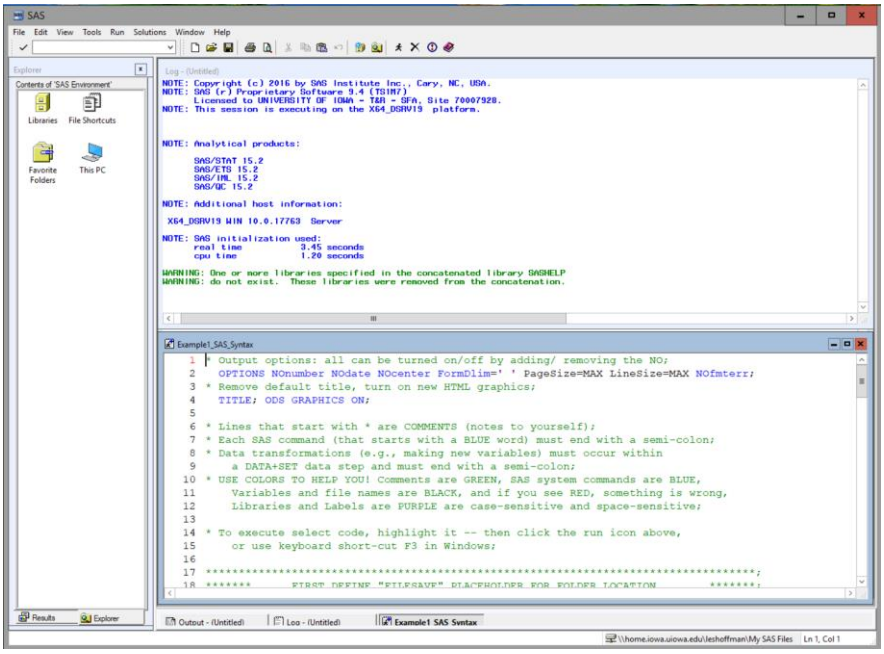
So the path for my university OneDrive folder (with reversed slashes relative to Windows) would look like this (in which the last slash is usually optional):

`setwd("C:/Users/leshoffman/OneDrive - University of Iowa/PSQF6243_Example1/PSQF6243_Example1/")`

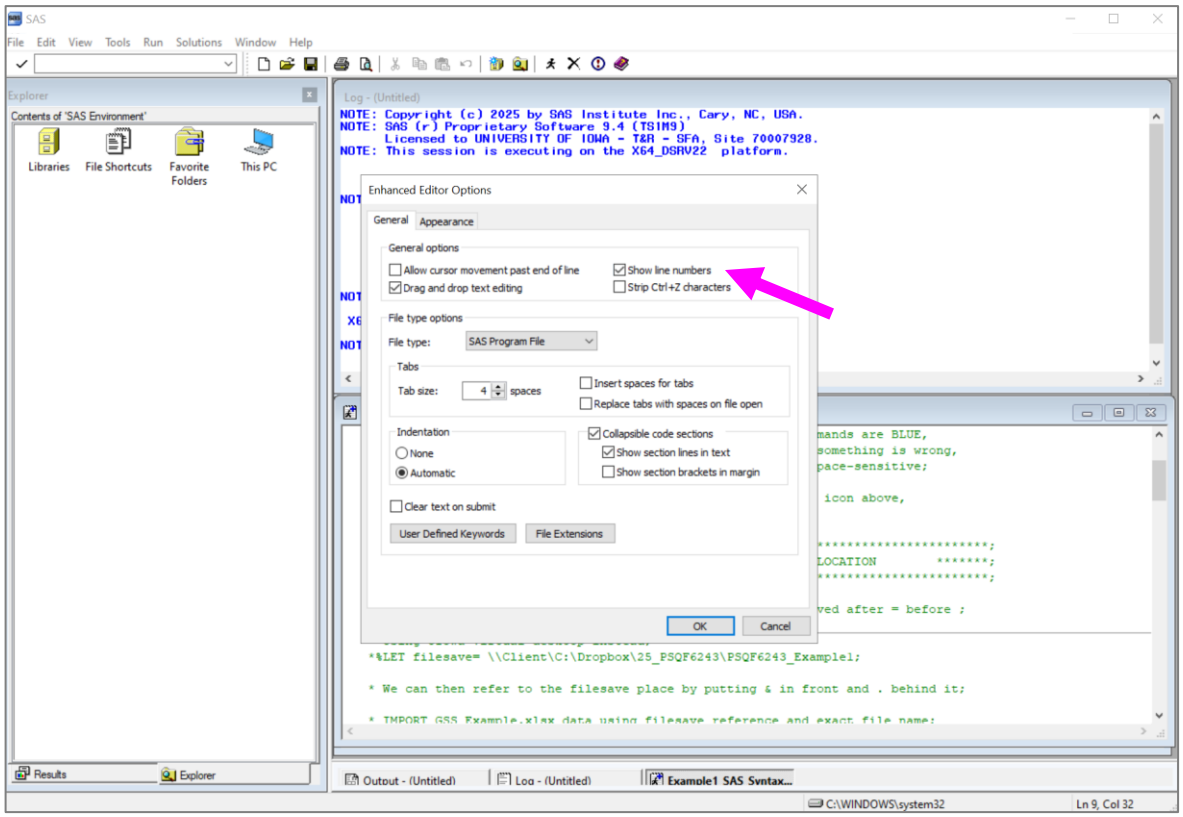
Step 5a for SAS. From the original **Virtual Desktop** page, **open SAS**. Put your cursor in the bottom right box labeled "Editor – Untitled 1". On the **File** menu, select **Open Program**:



Navigate to your **Example1_SAS_Syntax.sas** file and open it. It should look like this:



To make **line numbers visible** on your syntax (i.e., as shown on the left side of the file above), go to **Tools → Options → Enhanced Editor → General** tab, and check the box **Show Line Numbers** (see pink arrow below). Under the Appearance tab, you can change the font as well.



Step 5b for SAS. In the **Example1_SAS_Syntax.sas** file, **scroll to line 22** where it says

```
%LET filesave= C:\Dropbox\25_PSQF6243\PSQF6243_Example1;
```

This was where *MY* files were originally when I created this example. To change it, **paste in the path (after the =) that you found from Windows Explorer in Step 4**—this will tell SAS where your folder is that contains the data file to be used. **End the path with a semi-colon.** The path for my university OneDrive folder would look like this:

```
%LET filesave= C:\Users\leshoffman\OneDrive - University of
Iowa\PSQF6243_Example1\PSQF6243_Example1;
```

Here are some more examples of what that path would look like using different operating systems and folder locations, assuming your folder is called "PSQF6243_Example1":

```
* Windows example using UIowa Virtual Desktop on a local drive;

  %LET filesave= \\Client\C:\Dropbox\PSQF6243_Example1;

* Mac example using UIowa Virtual Desktop on a local drive;

  %LET filesave= \\Client\C:/Users/username/Desktop/PSQF6243_Example1;
```

Step 6. You should now be able to run the syntax file without errors in each program. I would recommend running the syntax in chunks so you can see what happens at each step.

To run STATA syntax: Highlight the text to be executed and hit control+D to execute (or move the mouse to the "run" icon in the toolbar).

To run R syntax: Highlight the text to be executed and hit control+enter to execute (or move the mouse to the "run" icon in the toolbar).

To run SAS syntax: Highlight the text to be executed and hit either F3 (windows) or F8 (mac) to execute (or move the mouse carefully to the running-man icon on the toolbar).

STATA: In case of emergency… if working with the Virtual Desktop is too annoying or you need to use Stata without an internet connection, you can purchase a six-month student license for $48 here: https://www.stata.com/order/new/edu/gradplans/student-pricing/

SAS: In case of emergency… if working with the Virtual Desktop is too annoying, another way to access SAS for free is through SAS On-Demand, which operates through a web browser: https://www.sas.com/en_us/software/on-demand-for-academics.html

R: In case of emergency… if working with the Virtual Desktop is too annoying, R+Rstudio can be installed on your local machine. R download (install first): https://www.r-project.org/
Rstudio download (install second): https://www.rstudio.com/products/rstudio/

To edit your syntax files outside the program, I strongly recommend using a plain-text editor, such as WordPad for Windows or TextEdit for Mac. I like the program TextPad, which allows you to install syntax definition files (i.e., so that the same coloring is used as in the software).

> Download TextPad generic syntax editor: https://www.textpad.com/download
>
> Download "SAS4" or "Stata" or "R" syntax definitions (save to "system" folder of TextPad, then install as "New Document Class"): https://www.textpad.com/addons/syntax-n2t