Getting Started Using Statistical Software Inside the UIowa Virtual Desktop
For a Live Demo, watch the accompanying video introducing Mplus!

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 **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 first enter your HawkID name and usual password. The box called **second password** refers to a two-factor authentication method. If you type **push** it will ping your two-factor program for approval (i.e., as installed on your smart phone). Alternatively, if you type **sms** it will tell you that you could not log in, but ignore this. In the box that appears again, enter your same HawkID and usual password, and then for the second password enter one of the six-digit codes that should have been sent in a text message.

Step 1c. If you are on-campus, you will need to be connected to the eduroam UIowa 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 2. If you haven't already do so, **map your H: drive to your computer**, which is a campus network drive that will be the most easily linked to the Virtual Desktop software. (You don't *have* to use it, but previous students have had the most success putting files here). Instructions to do so for both Windows and Mac are here: https://its.uiowa.edu/support/article/104047
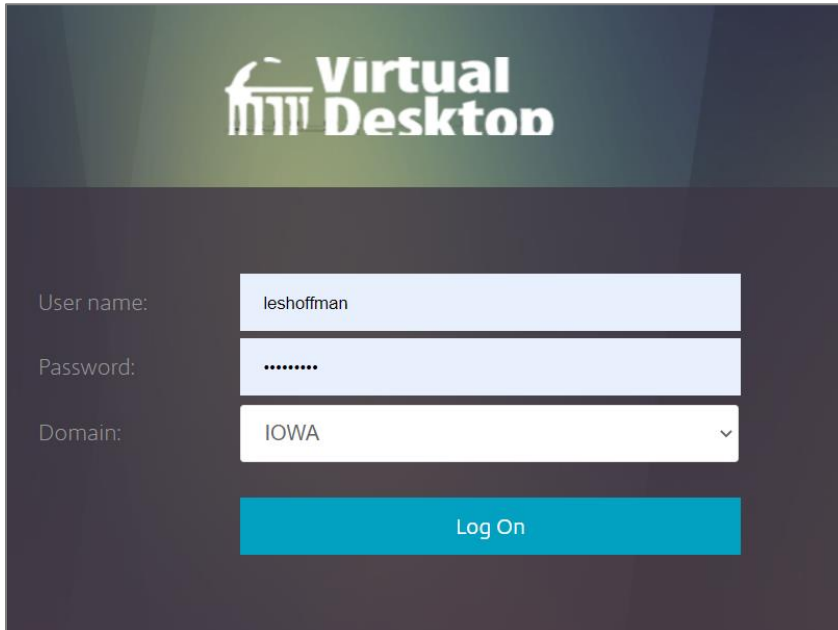
Step 3. Download and unzip (extract) the intro to Mplus files linked here:
https://www.lesahoffman.com/PSQF6249/PSQF6249_Mplus_Intro.zip

> It will be easiest if you put the example folder inside your university H: drive (but any folder can be used). The folder includes an Excel data file (.xlsx extension), a comma-separated-values version of the Excel data file (.csv extension that will be used by Mplus as the data file), and two examples of Mplus program syntax (.inp extension) and output (.out extension) so you can see what each example program does. I also included the Mplus syntax guide I wrote to go along with the Mplus examples for my *Longitudinal Analysis* textbook (the first half of which will be relevant in learning Mplus).
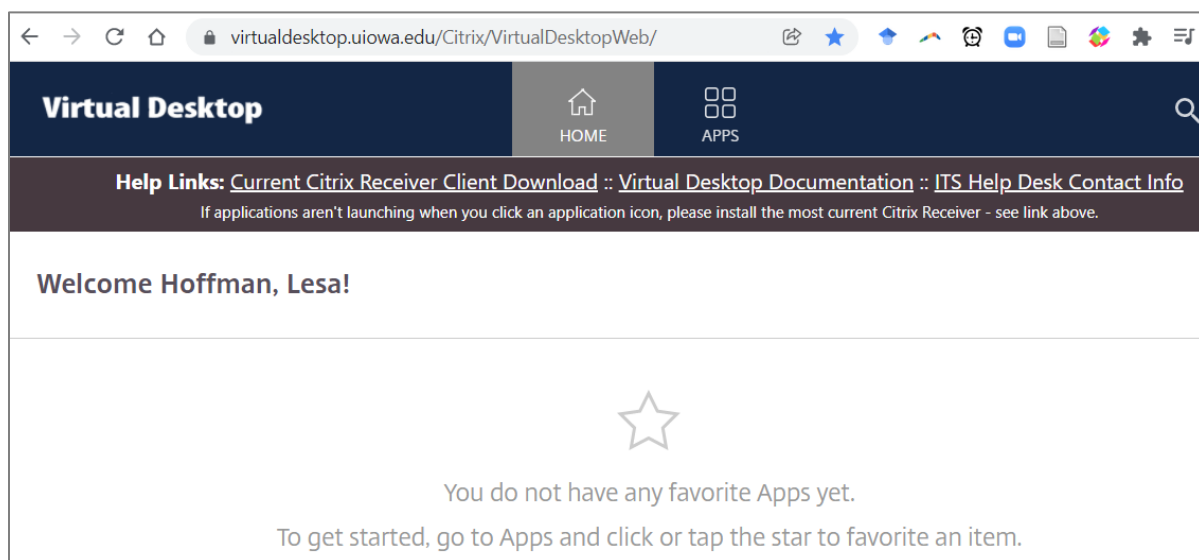
Step 4a. After completing steps 1–3, you can access the U Iowa Virtual Desktop login from this page (also linked from the course webpage): https://its.uiowa.edu/virtualdesktop

If you have not already downloaded and installed the Citrix Workspace program that runs the Virtual Desktop, it will prompt you do so.
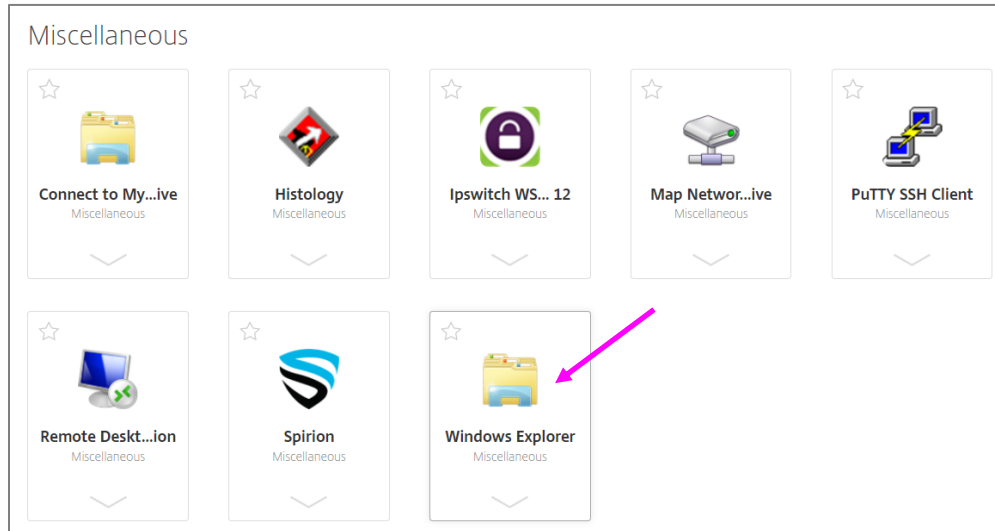
Once the program is installed, you can open it and a log-in box will appear. Enter your HawkID name and usual password for the domain IOWA as shown below:
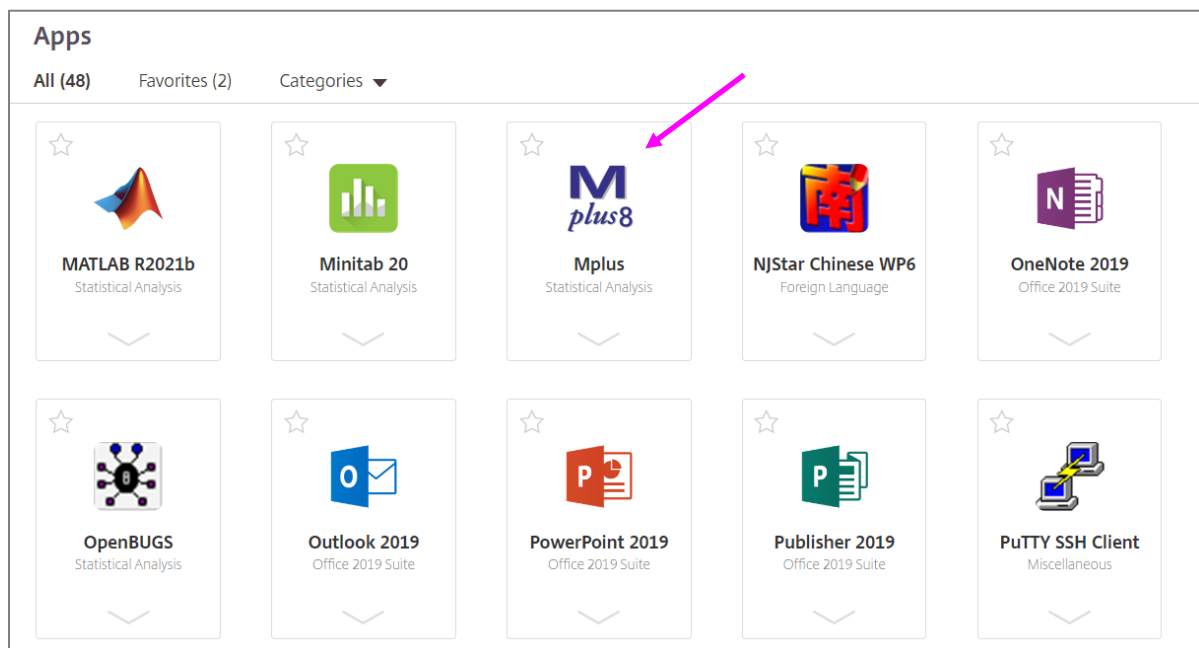

Once logged in, the front page will look something like this (if you haven't used it before):
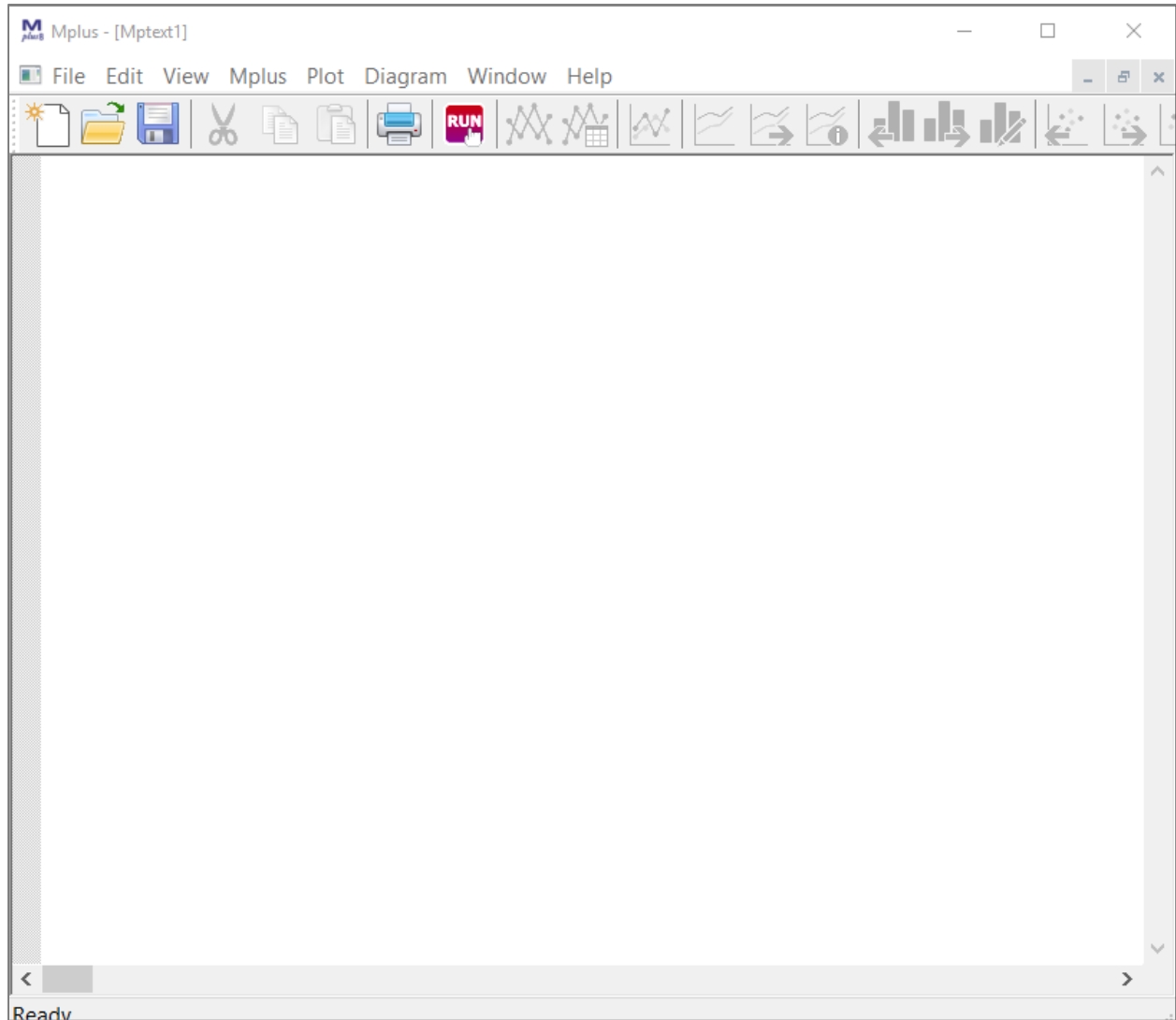
Step 4b. Go to **APPS → Categories → Miscellaneous**. You will find **Windows Explorer** (highlighted by the pink arrow below) which will be critically useful in telling Virtual Desktop how to access the files on your local computer. Click the down arrow on the program, and then click on the star next to "add to favorites" and it will be saved to your home screen.

Step 4c. Go to **APPS → Categories → Statistical Analysis**. There you will find Mplus 8 (as highlighted by the pink arrow below). 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 5a. Click on the Mplus icon and it will open after a few minutes in a new window like this:

Step 5b. Under the "File" menu, select "Open Program" and navigate to where you stored this file: **Example_Syntax_TYPE=BASIC.inp**. You should be able to run this input (.inp) file by clicking on the red RUN button and generate a separate output file (.out) in the same window.

You can then open the other input file (**Example_Syntax_With_MODEL.inp**) and run it as well. The output has already been provided for you (but will be written over when you run it yourself). I will describe the syntax and output in the accompanying video.

To edit your syntax files outside the Mplus program, I strongly recommend using a plain-text editor, such as WordPad for Windows or TextEdit for Mac. I like the program TextPad; here is a link: https://www.textpad.com/download