Installing MATLAB and COMPECON Toolbox

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Software and Computer

In this course every student needs to have a laptop installed with a computing software environment called MATLAB. You will also need the add-on package called CompEcon Toolbox. Bring your laptop to each lecture. This will allow you to work on programming drills in the class. The following steps will explain how to install MATLAB on your laptop and how to obtain and install the CompEcon Toolbox.

Installing MATLAB R2019a on Mac and Windows

1. Go to https://www.mathworks.com/
2. Login if you have a Mathworks account or click Create Account if you do not have one. **Note: use your TTU e-mail address.**
   - You can login by clicking the "person" icon in the upper right corner. If you do not have an account then click on the "person" icon and create one.
3. After login click on your login name in the upper right corner and select My Account.
4. This will generate a list of licenses. Select license 714225.
5. Click Download on the next page and R2019a on the subsequent page.
6. If prompted, select the appropriate operating system and the download will start.
7. Run the installer from the downloaded file and follow the instructions to install MATLAB. This might take some time so plan accordingly to allow the install/download to complete without interruption.

Installing CompEcon Toolbox on Mac and Windows

Many of the examples we study in this class will be taken from Miranda and Fackler's book Applied Computational Economics and Finance. The model solvers developed by those authors and MATLAB scripts for solving examples in the book can be downloaded as a package "CompEcon Toolbox" from the authors' website https://pfackler.wordpress.ncsu.edu/compecon/.

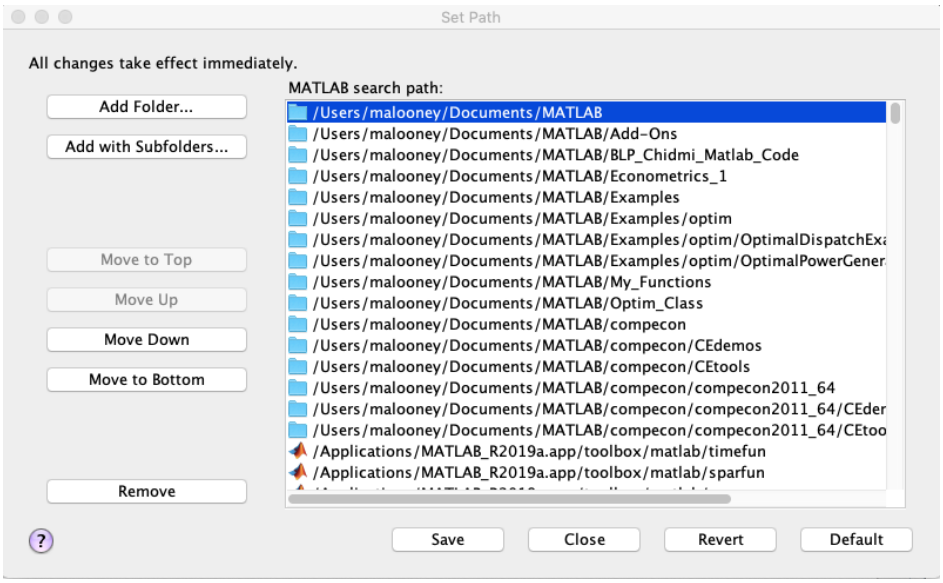
1. Download CompEcon Toolbox from https://pfackler.wordpress.ncsu.edu/compecon/154-2/
2. I suggest you install the 64-bit version of the software.
3. After the file downloads, locate the file on your computer. It will be called compecon2011_64_20110718.zip (if you downloaded the 64-bit version).
4. When you installed MATLAB a directory was created in your "Documents" folder called "MATLAB". I suggest you copy the downloaded file called "compecon2011_64_20110718.zip" into your MATLAB folder.
5. Unzip the file called "compecon2011_64_20110718.zip". This will create a folder called "compecon2011_64_20110718".

6. At this time I suggest you create a second folder in your MATLAB folder called "Optim_Class_Fall_2019". This is optional but useful. You can place all materials from the class in this folder.
7. CompEcon Toolbox is now installed.

Setting the Path in MATLAB on Mac and Windows

For MATLAB to find the files (CompEcon Toolbox and script files) on your computer you need to tell MATLAB where the files are located. The easiest way to do this is to "Set Path" to your MATLAB folder inside your Documents folder.

1. Open the MATLAB program.
2. Click on the "HOME" tab in the upper left corner.
3. You will see a button called "Set Path". Click the button.
4. You will see a screen that looks like the following:



5. Click on the "Add with Subfolders" button.
6. Navigate to your Documents folder and select the MATLAB folder. Click "Open" (on Mac) or "Select Folder" (on Windows).
7. Click "Save" and then "Close".
8. The path is now set. Anything saved inside your MATLAB folder will now be visible to MATLAB.
9. If you created a folder called "Optim_Class_Fall_2019" in your MATLAB folder then simply copying files into this folder will automatically add the files to the MATLAB path. EASY!

Compiling the CompEcon Toolbox

For the CompEcon Toolbox to function properly we need to compile some code. If you have never compiled code before this can sound scary but I assure you the process is not very complicated.

For Mac users

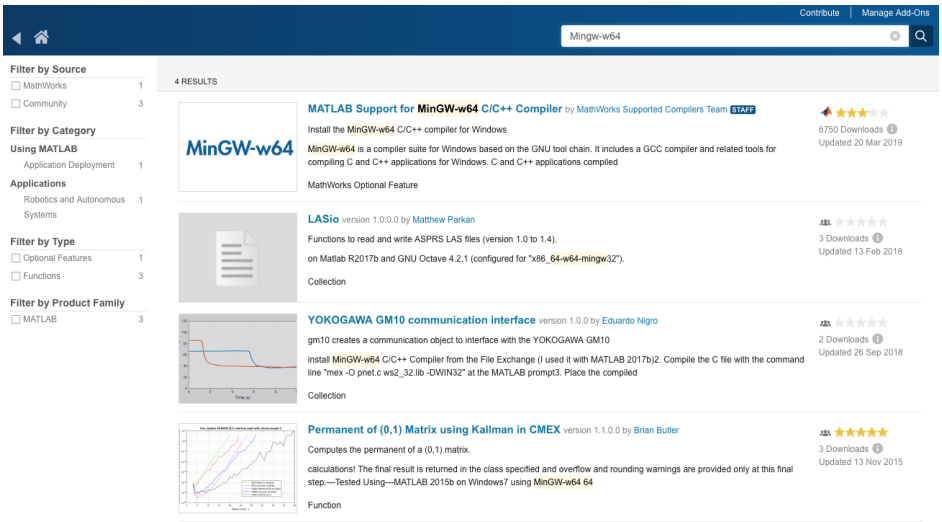
We need to install the "command line tools".

1. Open the "Terminal" application. This is inside the "Utilities" folder inside the main "Applications" folder on your hard drive.
2. At the command prompt, type "Xcode-select –install".
3. Once the install is complete open the MATLAB application.
4. In the "Command Window" type, "mexall".
5. The CompEcon Toolbox code will start to compile. Wait until it is done.
6. Your code is now compiled. . . EASY!!

For Windows users

We need to download a Windows compatible compiler. The easiest compiler to use is "Mingw-w64 - GCC for Windows 64 & 32 bits".

1. Open the MATLAB application and click on the "HOME" tab.
2. Click on the "Add-Ons" button in the upper right of the screen.
3. The "Add-On Explorer" will open.
4. In the upper right of the screen there is a search bar. Type "MinGW-w64" and hit enter.
5. The following screen will appear:



6. Click on "MATLAB Support for MinGW-w64 C/C++ Compiler" and click the "Install" button. Follow the directions for installing the compiler.
7. Once the install is complete, close the "Add-On Explorer".
8. In the "Command Window" of MATLLAB, type, "mexall".
9. The CompEcon Toolbox code will start to compile. Wait until it is done.
10. Your code is now compiled. . . EASY!!

Renaming the "Psi" function in CompEcon Toolbox

We are almost done.

There is one small issue with the CompEcon Toolbox. MATLAB has a built-in function called "Psi.c". However, CompEcon Toolbox also has a function called "Psi.c". This throws a warning message when you start MATLAB after installing and compiling CompEcon Toolbox.. The easy work around is to rename the CompEcon Toolbox function "Psi.c" to something else.

None of the scripts we will use in this class require use of the Psi.c function but you need to keep in mind that we are renaming the "Psi.c" function so if in the future you use a script that requires use of the "Psi.c" function you will need to rename that inside the script. This sounds convoluted and complicated but it is not. It is just hard to explain in words. The action is very simple.

1. Open the MATLAB folder inside your Documents folder.
2. Open the CompEcon folder.
3. Open the CEtools folder and scroll down until you find the file named "Psi.c".
4. I suggest you rename all "Psi.x" files to "Psi_cet.x", where "x" represents the file extension and "cet" stands for compecon toolbox. For example, the file called "Psi.c" will be renamed to "Psi_cet.c". Depending on the version of CompEcon Toolbox you will have about six files to rename. Rename them all.
5. Once you have done this restart MATLAB. You should not see any warning notices about the Psi function. If you do you have missed renaming a file.

You should now have a fully functioning version of MATLAB installed.

You should have the CompEcon Toolbox installed.

Your Path should be set to the MATLAB folder inside your Documents folder.

You should have all code compiled.

You should not see any warning notices when starting MATLAB.

If you had trouble with any of these steps please get in touch with me and I can help guide you through the process.