

# Pre-Class Batch Processing Instructions for CJL

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Updates at: [Github Link](#)

## Abstract

The goal of this session is to discuss data management and **demonstrate how I automate the execution of scripts across multiple software types** which greatly increases chances for replication and reduces time doing mundane data management tasks. This document helps setup prerequisites to make the session more interactive.

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# 1 Introduction

I use **Stata, R, and Python**. I know Stata is not free and understand if you do not have it, although I think you should buy it if you plan to remain in academic economics.

R and Python are free, so this is still worth learning.

Even if you only use 1 of these programs, I am going to make the case for you to use all of them so I encourage you to keep an open mind and follow this guide.

**This session will run smoothest if you have these programs installed and know where their executable (.exe) is in your computer's file system.**

**This guide shows how to install the programs and find their executable files.**

Then, I show how to add the executables to path.

**I have also never tested this system on MacOS**, I know you can run “virtual Windows” on a Mac and it might be worth it for this.

## 2 One Click Execution of Common Software for Economists

Sooner or later, you'll run into something difficult in your preferred software

This gives you 4 options:

1. Spend a lot of time re-inventing the wheel in your preferred language
2. Limit the research questions you can ask and answer, because it's not in your preferred language
3. Try to find coauthors who use the other softwares
4. Do it in another language, but that might break your scripting flow\*

\*Notice, I'm already assuming you have a “makefile” that runs all scripts in order

There's a really easy way create a multi-language makefile that I will show you

Batch processing is a .txt file saved with the extension .bat

It's contents are lines of code with this general recipe:

```
“software path” “ManageBuildDirectories.py”  
::“software path” “script path”  
::Old script that is commented out and not used anymore  
“software path” “script path”  
“software path” “script path”  
“software path” “D: Dropbox \ GregBenSean \ NYCTough \ Work \ Build \ Code \  
MergeData.R”  
“C:\Program Files\R\R-4.1.0\bin\Rscript.exe” “D: Dropbox ... Work \ Build \ Code \  
CreateVariables.R”  
“C:\Program Files\Stata16\StataMP-64.exe” /e do “D: \ Dropbox ... Work \ Analysis \ Code \  
AnalyzeData.do”
```

The slides are mostly about where script paths go.

There's an actual example batch file in the slides.

This document is more about the software aspect.

### **3 R**

Stata people, install R. You don't have to replace Stata with it, but you might need something it does at some point.

R people, please don't sneer at my passing knowledge of R.

For R, I use R Studio as my IDE.

Install it from: <https://www.rstudio.com/products/rstudio/download/>

Here's 2 pictures:

Figure 1  
(a) R Studio Home Page

|                                       | RStudio Desktop<br>Open Source License<br><b>Free</b> | RStudio Desktop Pro<br>Commercial License<br><b>\$995</b><br>/year | RStudio Server<br>Open Source License<br><b>Free</b> | RStudio Workbench<br>Commercial License<br><b>\$4,975</b><br>/year<br>(5 Named Users) |
|---------------------------------------|---|--|--|---|
| Integrated Tools for R                | ✓   | ✓  | ✓  | ✓   |
| Priority Support                      |   | ✓  |  | ✓   |
| Access via Web Browser                |   |  | ✓  | ✓   |
| RStudio Professional Drivers          |   | ✓  |  | ✓   |
| Connect to RStudio Workbench remotely |   | ✓  |  |   |
| Enterprise Security                   |   |  |  | ✓   |

(b)

### RStudio Desktop 1.4.1717 - Release Notes

1. Install R. RStudio requires R 3.0.1+.
2. Download RStudio Desktop. Recommended for your system:

[Download RStudio for Windows 1.4.1717 | 156.18MB](#)

Requires Windows 10 (64-bit)

### All Installers

Linux users may need to import RStudio's public code-signing key prior to installation, depending on the operating system's security policy.

RStudio requires a 64-bit operating system. If you are on a 32 bit system, you can use an [older version of RStudio](#).

| OS                  | Download                                    | Size      | SHA-256  |
|---------------------|---|-----------|----------|
| Windows 10          | <a href="#">RStudio-1.4.1717.exe</a>        | 156.18 MB | 71b36e64 |
| macOS 10.14+        | <a href="#">RStudio-1.4.1717.dmg</a>        | 203.06 MB | 2cf2549d |
| Ubuntu 18/Debian 10 | <a href="#">rstudio-1.4.1717-amd64.deb</a>  | 122.51 MB | e27b2645 |
| Fedora 19/Red Hat 7 | <a href="#">rstudio-1.4.1717-x86_64.rpm</a> | 138.42 MB | 648e2be0 |
| Fedora 28/Red Hat 8 | <a href="#">rstudio-1.4.1717-x86_64.rpm</a> | 138.39 MB | c76f628a |
| Debian 9            | <a href="#">rstudio-1.4.1717-amd64.deb</a>  | 123.29 MB | e4ea3a60 |
| OpenSUSE 15         | <a href="#">rstudio-1.4.1717-x86_64.rpm</a> | 123.15 MB | e69d55db |

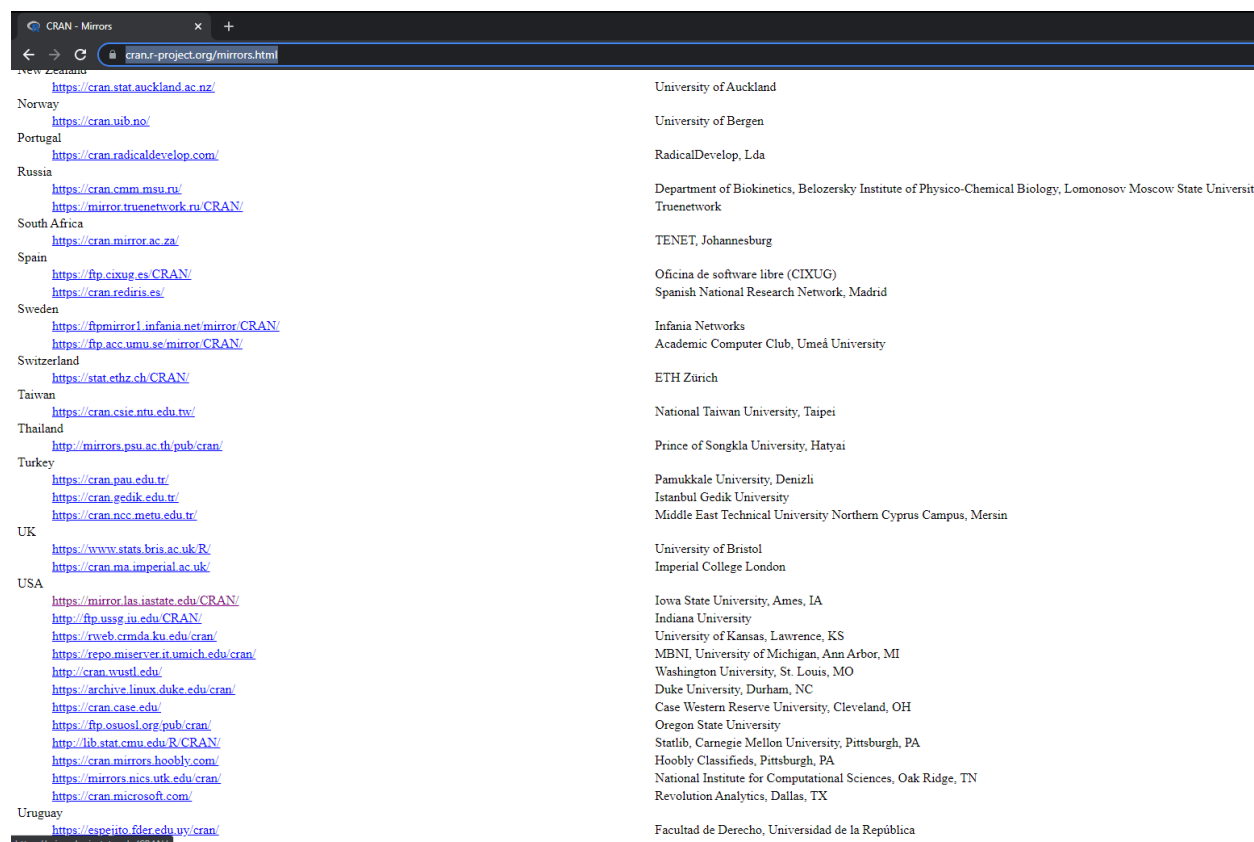
**Note:** Choose free in (a), choose your OS in (b).

You will also need to download R.

Install it from: <https://cran.r-project.org/mirrors.html>

Here's a picture:

Figure 2



**Note:** Pick a mirror in the US. I did the first one which was Iowa State's.

Next you should locate the .exe.

Ben's .exe path is: "C:\Program Files\R\R-4.1.0\bin\Rscript.exe"

My .exe path for R is:

## 4 Python

Stata and R people, install Python. Do R and Stata do a lot of the same things as Python? Yes.

Do Stata and R do those same things as well as Python? In my opinion, no.

Also, don't forget about the things Python does, that Stata and R do not.

In short, Python is a one-stop shop for Swiss-knife type data analysis/management needs.

I never took a class in Python, just messed around with and it learned things from Google.

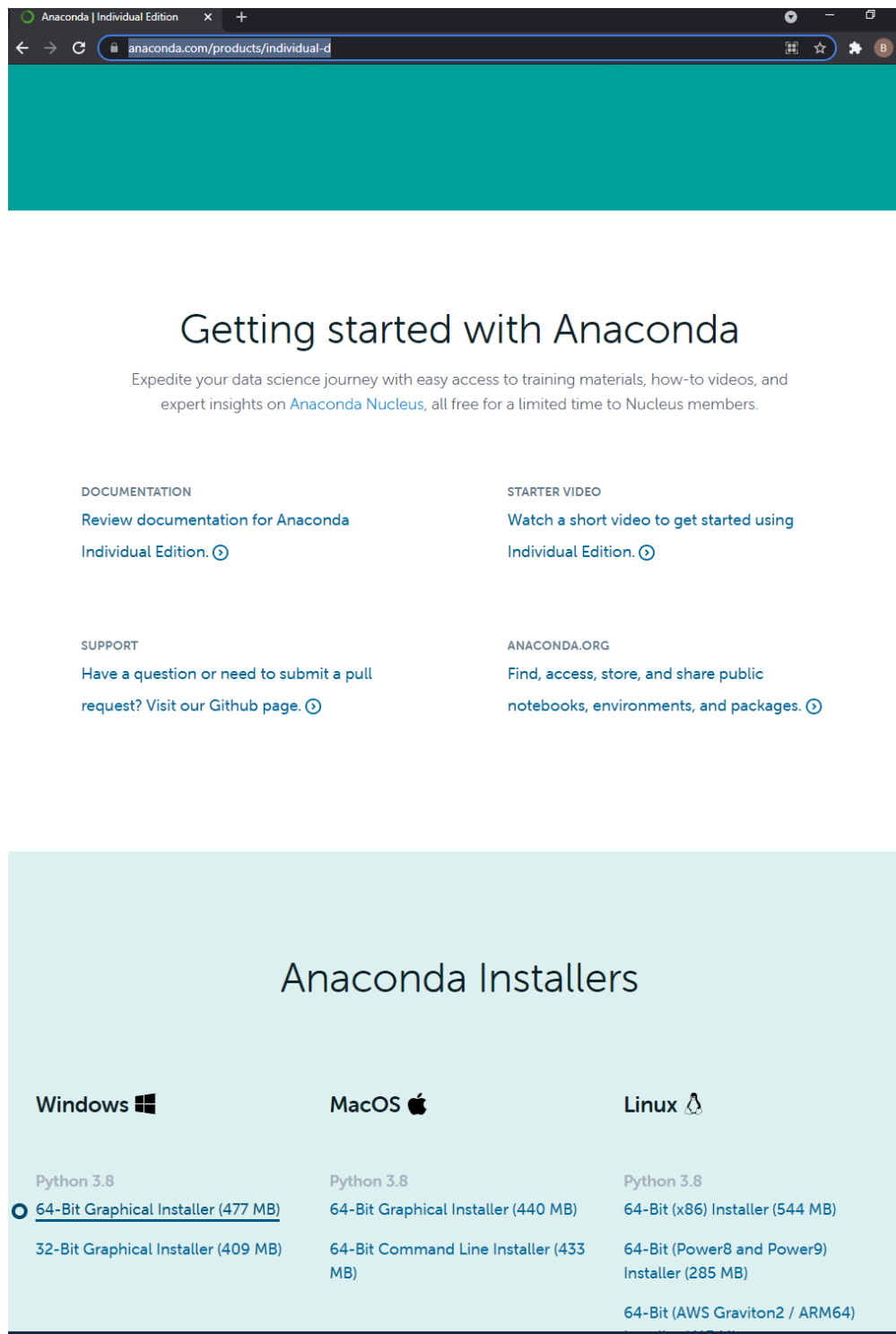
So my default go to GUI is scripting in Anaconda.

With this, you get the Spyder IDE which is what I use.

Website: <https://www.anaconda.com/products/individual-d>

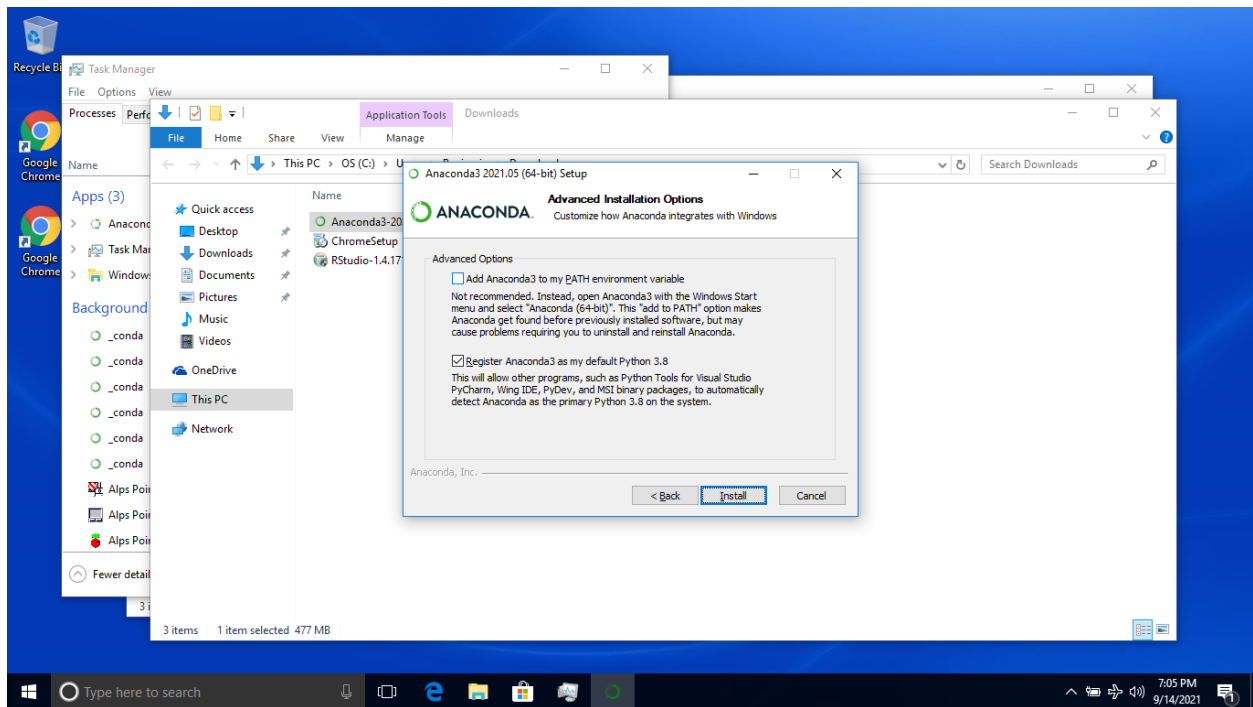


Figure 3



**Note:** You have to scroll down from <https://www.anaconda.com/products/individual-d>.

Figure 4: Do Not Add Python/Anaconda to Path, Will Do That Manually. Do Not Check Blue Box



**Note:** Do not check the path box. We will do that ourselves.

**Important:** Do not check the box

Then I download Python, because my batch hasn't like the Python from Anaconda.

Website: <https://www.python.org/downloads/release/python-397/>

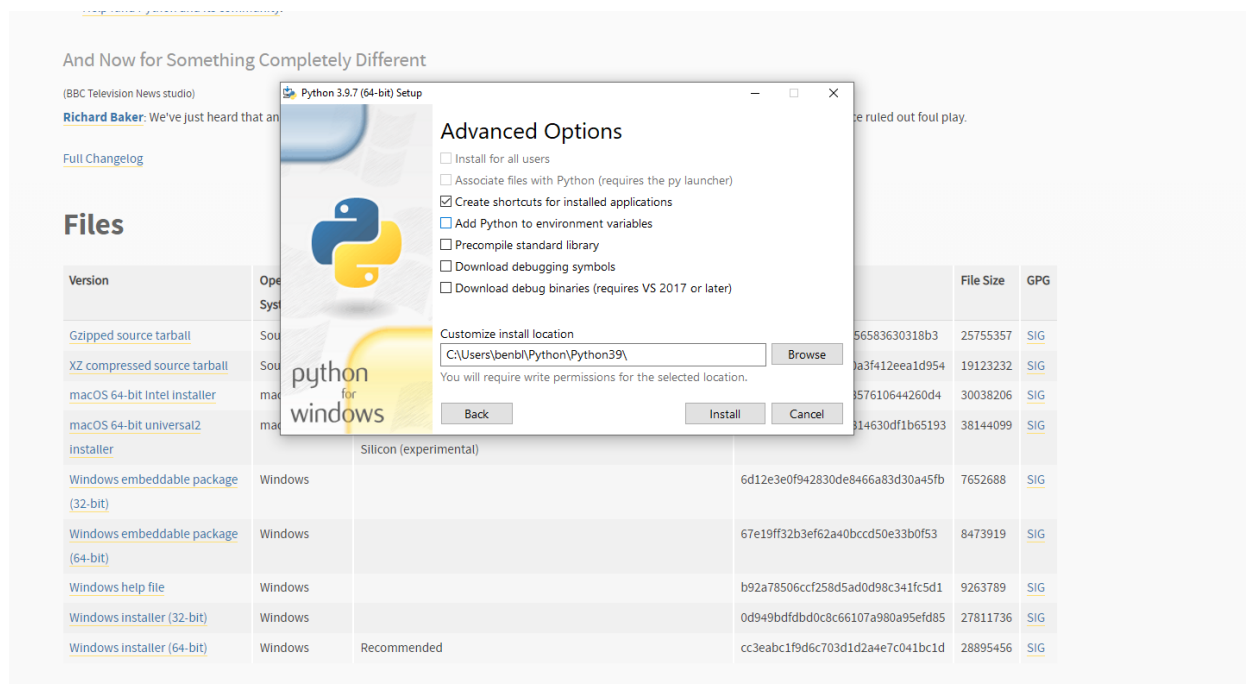
Picture:

(a) Python Home Page



**Note:** Choose 3.x in (a), choose your OS in (b). Click the left most column link of your OS in (b).

Figure 6: Do Not Add Python to Path, Will Do That Manually. Do Not Check Blue Box



**Note:** Do not check the path box. We will do that ourselves.

Important: Do not check the box

Ben's .exe path for Python is: C:\Users\benbl\Python39

&

C:\Users\benbl\Python39\Scripts

My .exe path for Python is:

## 5 Stata

If you have this, then great.

Look for your Stata executable.

My .exe path is: "C:\ Program Files\ Stata16 \ StataMP-64.exe"

## 6 Adding Programs to Path

This cleans up the batch file

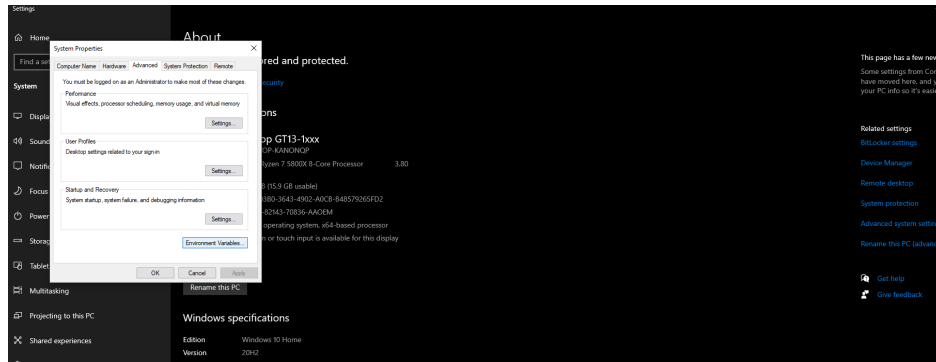
It also helps with working across several computers/people

The batch file can look for executables in the “path” so we’ll add them

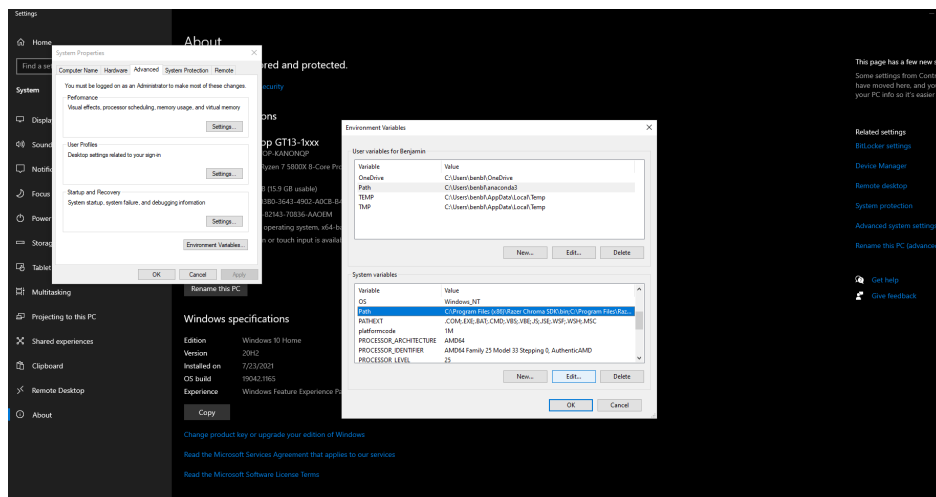
You need to go to this pc > right click > properties > advanced > environment variables

Here are pictures:

Figure 7: Navigating to System Path  
(a) Finding Advanced Settings



(b) Getting to Environment Variables



**Note:** (a) is after going to properties on this PC. Then clicking the advanced system settings at the right. (b) is after clicking on environment variables in (a).

Add the folders with the .exe's we're using

My path looks like this:

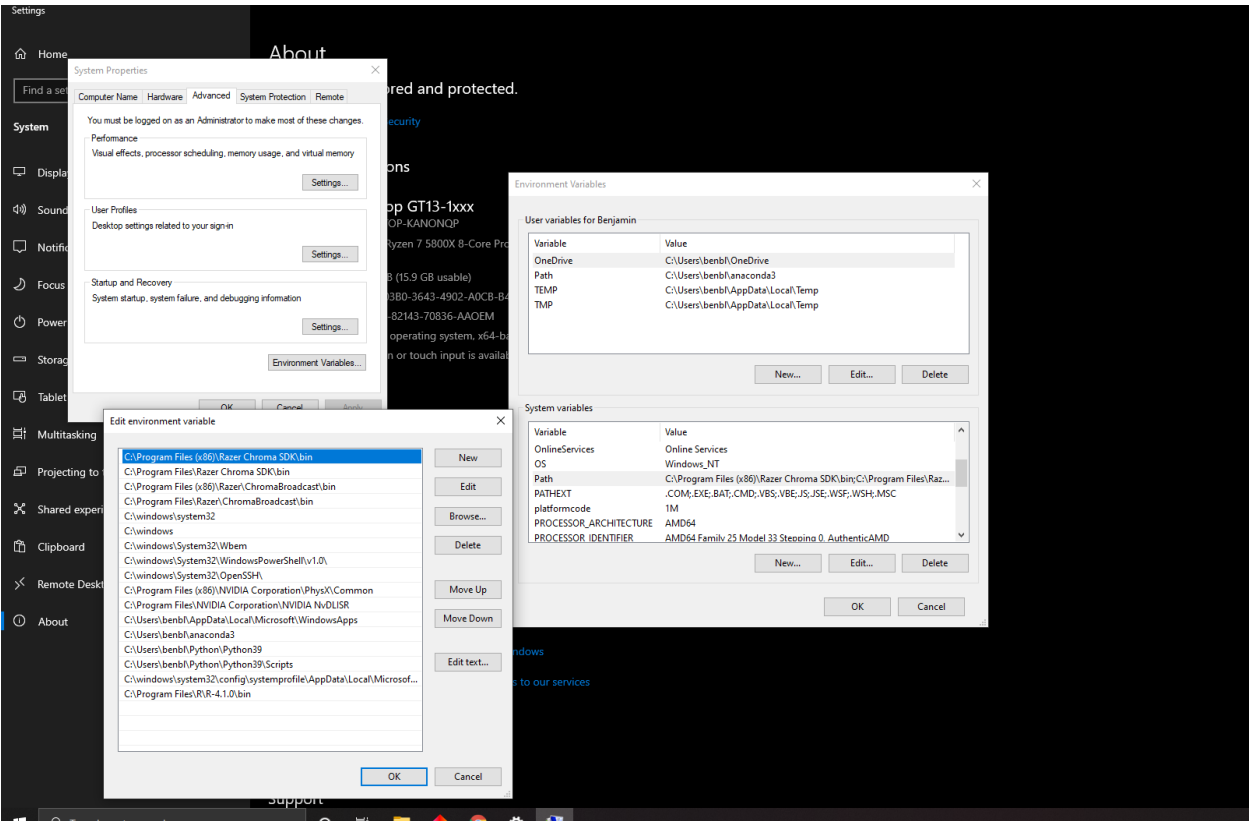
## 7 Pre-Class Instructions

Install Python and R programs and know the .exe paths for both of them.

Download the class example folder of batch example in different languages from : [Github Link](#)

We will add folders to path during class.

Figure 8: Path



Note: