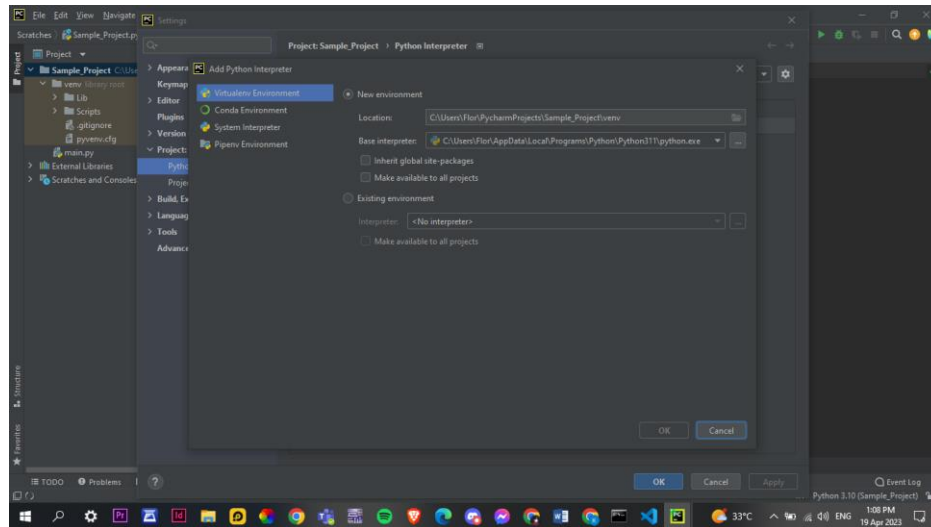## 2. Python Installation (10 points)

For this course, a proper Python installation is needed to make sure that all the given codes will run properly. Show a step-by-step procedure for creating a Python virtual environment. Provide screenshots and discussion for every step. Specify the platform you are using (Windows, Mac, Linux-based, etc.)

To create a virtual environment for an existing project, I used Pycharm as an IDE. Before heading directly to the terminal to code, I checked the settings first at Virtual Environment, ensuring that the "New environment is checked". After doing so, I have to activate the virtual environment hence, I did the following step of codes.
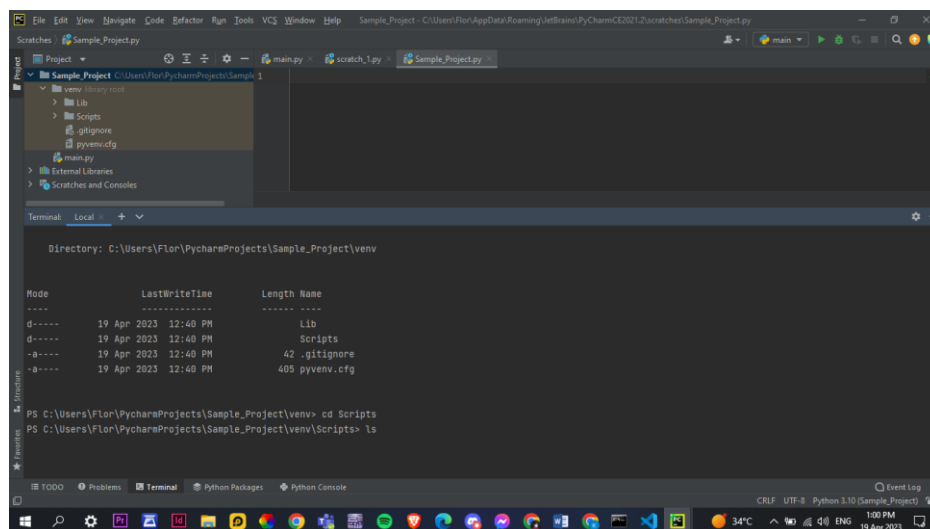
Heading out to the terminal, start to write the command "ls" which shows all the folders that I currently have in the directory.

One of the folders is the "venv" folder. Write the command "cd venv" to change the directory to go into venv. and write the command "ls" again to show the following lists of folders in the virtual environment.

Focusing on the "Scripts" folder, write the command "cd Scripts" and "ls" which change the directory and shows the lists of the folder inside that directory.

In the scripts folder, we have to use the "activate.ps1" since we have the initial "PS" or PowerShell in the terminal at the beginning of the path. Thus, I wrote the command "activate.ps1" and executed the code which will naturally show an error because running scripts is disabled on the system

In order to solve this, I have to write the command "Get-ExecutionPolicy" By default it is Restricted. To allow the execution of PowerShell scripts we need to set this Execution Policy either as Unrestricted or Bypass.

We can set the policy for Current User as Bypass by using any of the PowerShell commands: "Set-ExecutionPolicy -Scope CurrentUser -ExecutionPolicy Unrestricted –Force" "Set-ExecutionPolicy -Scope CurrentUser -ExecutionPolicy Bypass –Force"

3. Modules (15 points)

The strength of programming language comes from the wide range of available tools to aid in our data manipulation, calculations, and visualizations. Give three Python packages, state their main usage, and why they are essential for the course. Then, install these properly on your Python virtual environment. Follow the similar steps you did for item number 2.

In the same Virtual environment. I can easily install any Python modules and packages by using the command "pip install (name of the package or module)". For this instance, I installed Numpy, TensorFlow, and Sympy.

NumPy offers comprehensive mathematical functions, random number generators, linear algebra routines, Fourier transforms, and more. NumPy is commonly used by data scientists, Engineers, and Physicists in order to work through numerical analyses and functions, such as creating and working with arrays, returning descriptive statistics, and a variety of machine-learning models and mathematical formulas.

TensorFlow is an open-source program library for fast numerical calculation. It is a well-known math library that Python machine learning and deep learning algorithms also utilize. The researchers in the Google Brain team under the Google AI division created Tensorflow. Researchers are now using it to develop machine learning algorithms, while physicists are using it to perform challenging mathematical calculations.

SymPy is the solution for all symbolic mathematics. The Python symbolic mathematics library is a useful tool for computer algebra systems (CAS), and it keeps the code as straightforward as possible to make it understandable and simple to extend. SimPy, which is exclusively developed in Python, may be integrated with other programs and enhanced with unique capabilities.