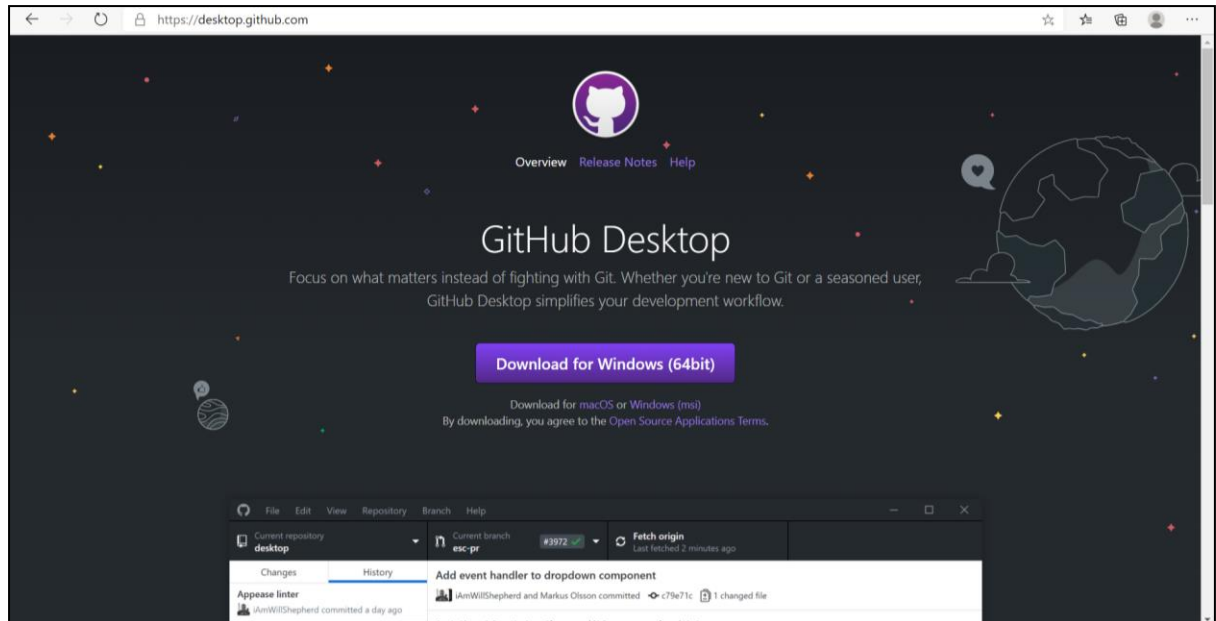
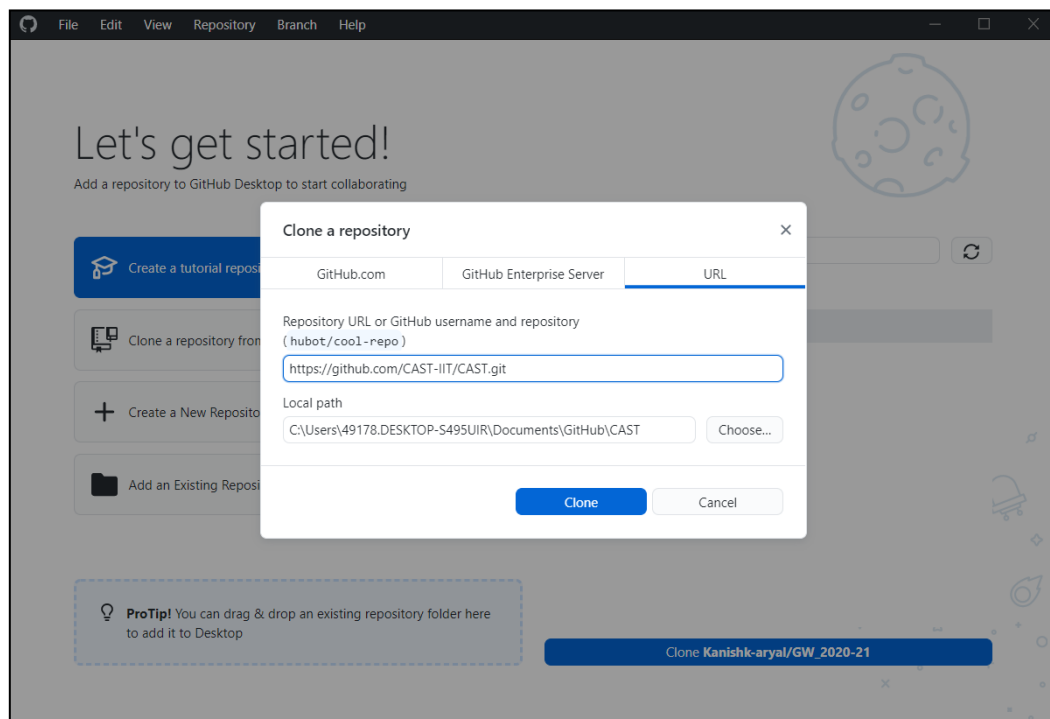


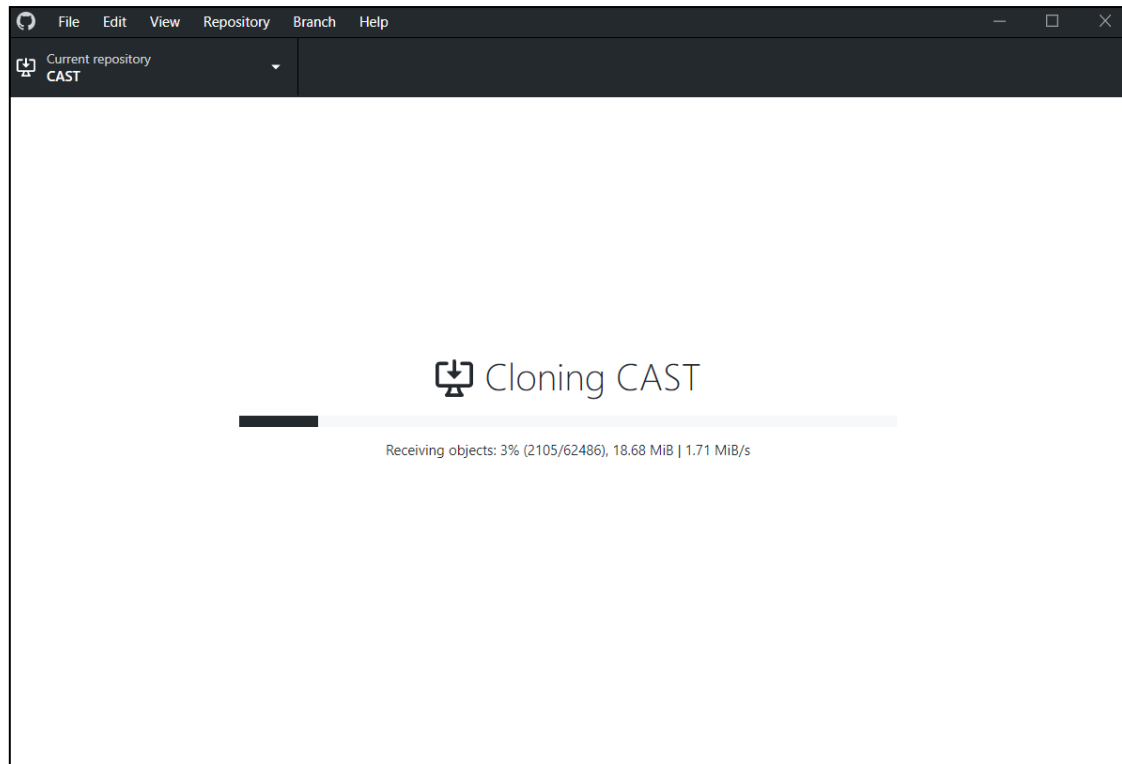
## Installation of Softwares required for successful running of CAST

### 1. Installation of Github Desktop

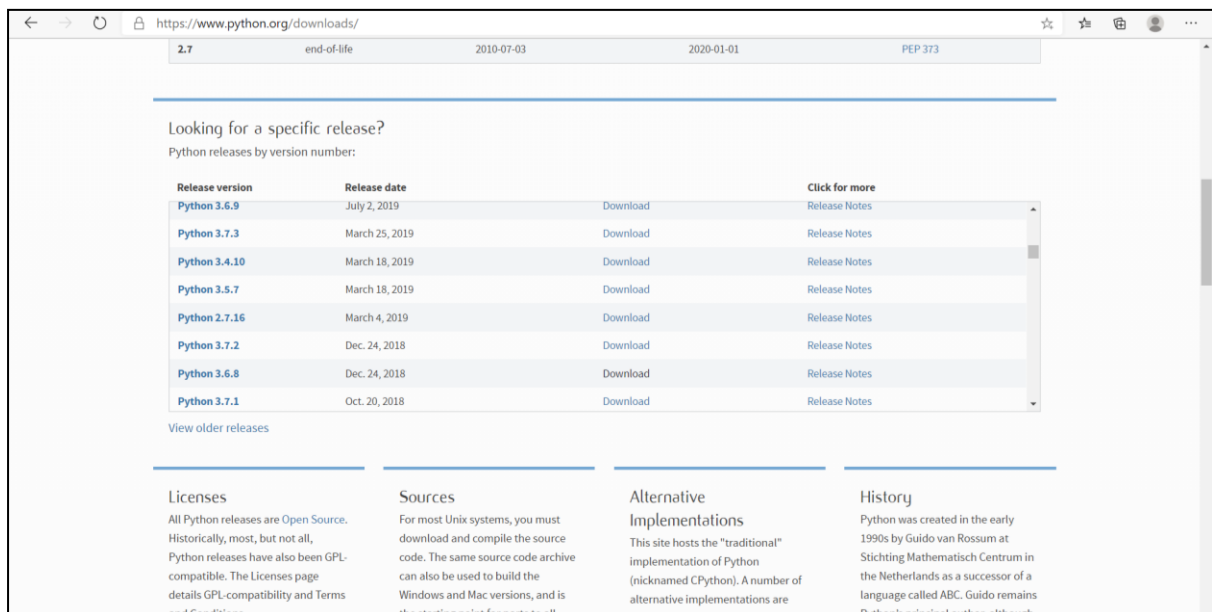


After successful installation of Github Desktop, open the Github Desktop Application and click on clone a repository. Under URL, paste the URL as seen below. This can also be alternately seen under [CAST-IIT/CAST at Personal-CAST-development \(github.com\)](https://github.com/CAST-IIT/CAST), under 'Code'. **[Please note Personal CAST is the default branch/master branch]**





2. Installation of Python: From the website '<https://www.python.org/downloads/>', download version **3.6.8** of Python. Click on the file version which is suitable for your Operating system.



https://www.python.org/downloads/release/python-368/

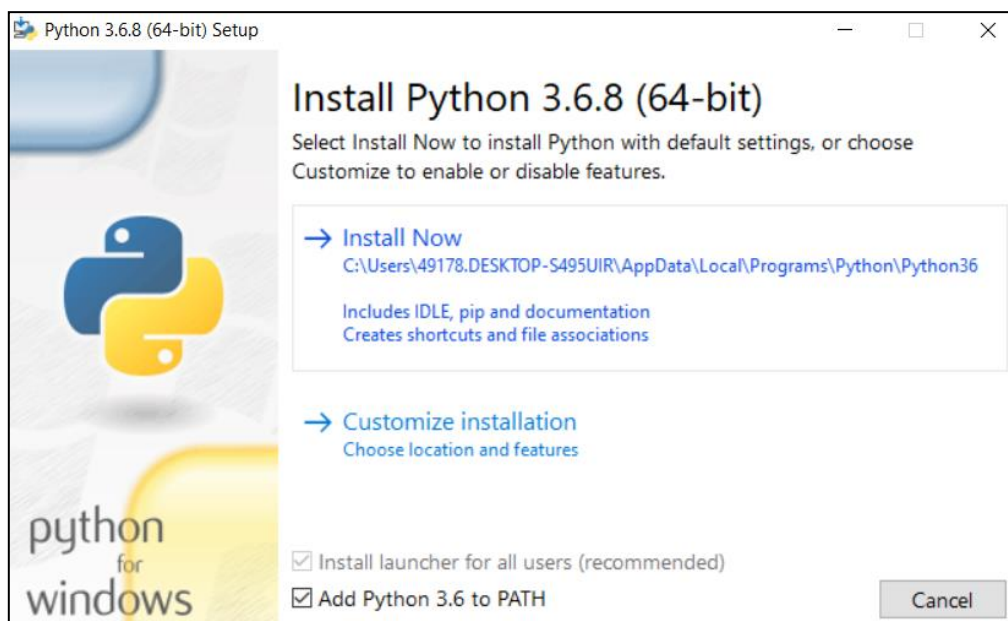
Both python.org installer variants include private copies of OpenSSL 1.0.2. Please carefully read the Important Information displayed during installation for information about SSL/TLS certificate validation and the Install Certificates command.

[Full Changelog](#)

## Files

| Version   | Operating System | Description                 | MD5 Sum                          | File Size | GPG                 |
|---|------------------|-----------------------------|----------------------------------|-----------|---------------------|
| <a href="#">Gzipped source tarball</a>              | Source release   |                             | 48f393a04c2e66c77bfc114e589ec630 | 23010188  | <a href="#">SIG</a> |
| <a href="#">XZ compressed source tarball</a>        | Source release   |                             | 51aac91bdf8be95ec0a62d174890821a | 17212420  | <a href="#">SIG</a> |
| <a href="#">macOS 64-bit/32-bit installer</a>       | Mac OS X         | for Mac OS X 10.6 and later | eb1a23d762946329c2aa3448d256d421 | 33258809  | <a href="#">SIG</a> |
| <a href="#">macOS 64-bit installer</a>              | Mac OS X         | for OS X 10.9 and later     | 786c4d9183c754f58751d52f509bc971 | 27073838  | <a href="#">SIG</a> |
| <a href="#">Windows help file</a>                   | Windows          |                             | 0b04278f5bdb8ee85ae66af0430b2    | 7868305   | <a href="#">SIG</a> |
| <a href="#">Windows x86-64 embeddable zip file</a>  | Windows          | for AMD64/EM64T/x64         | 73df7cb2f1500ff36d7dbec3968711   | 7276004   | <a href="#">SIG</a> |
| <a href="#">Windows x86-64 executable installer</a> | Windows          | for AMD64/EM64T/x64         | 72f37686b7ab240ef70fdb931bdf3cb5 | 31830944  | <a href="#">SIG</a> |
| <a href="#">Windows x86-64 web-based installer</a>  | Windows          | for AMD64/EM64T/x64         | 39dde5f535c16d642e84fc7a69f43e05 | 1331744   | <a href="#">SIG</a> |
| <a href="#">Windows x86 embeddable zip file</a>     | Windows          |                             | 60470b4cceba52094121d43cd3f6ce3a | 6560373   | <a href="#">SIG</a> |
| <a href="#">Windows x86 executable installer</a>    | Windows          |                             | 9c7b1ebdd3a8df0eebfda2f107f1742c | 30807656  | <a href="#">SIG</a> |
| <a href="#">Windows x86 web-based installer</a>     | Windows          |                             | 80de96338691698e10a935ecd0bdaacb | 1296064   | <a href="#">SIG</a> |

- Open the executable file, and click on Install now Button. Do not forget to check the box that says 'Add Python 3.6 to Path'.



- After the setup is successful, it is a mandatory step to check if pip is also installed and for the version of Python, we go to the Command Prompt.

```

Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\49178.DESKTOP-S495UIR>pip --version
pip 18.1 from c:\users\49178.desktop-s495uir\appdata\local\programs\python\python36\lib\site-packages\pip (python 3.6)

C:\Users\49178.DESKTOP-S495UIR>

```

- In case no pip version is found, we can install it through command prompt by entering this line of command- **'python get-pip.py'**.

6. Additionally, to verify the version of python, we can see it through the following line of command.

```
Command Prompt
Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\49178.DESKTOP-S495UIR>python --version
Python 3.6.8

C:\Users\49178.DESKTOP-S495UIR>
```

7. Installation of virtual environment.

```
C:\Users\49178.DESKTOP-S495UIR>pip install virtualenv
Collecting virtualenv
  Downloading https://files.pythonhosted.org/packages/79/88/66ac964ab8cf87c8db839c11812292a966825af205411cb67477cb4e73d3/virtualenv-20.2.1-py2.py3-none-any.whl (4.9MB)
    24% |#####| 1.2MB 2.0MB/s eta 0:00:02
```

- a) Create virtual Environment Files

```
C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST>virtualenv venv
created virtual environment CPython3.6.8.final.0-64 in 3194ms
  creator CPython3Windows(dest=C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST\venv, clear=False, no_vcs_ignore=False, global=False)
  seeder FromAppData(download=False, pip=bundle, setuptools=bundle, wheel=bundle, via=copy, app_data_dir=C:\Users\49178.DESKTOP-S495UIR\AppData\Local\pypa\virtualenv)
    added seed packages: Flask==1.0.2, Flask_Bcrypt==0.7.1, Flask_Login==0.4.1, Flask_Mail==0.9.1, Flask_MySQLdb==0.2.0, Flask_SQLAlchemy==2.4.0, Flask_WTF==0.14.2, Jinja2==2.11.2, MarkupSafe==1.1.1, SQLAlchemy==1.3.20, WTForms==2.3.3, Werkzeug==0.16.0, attrs==20.3.0, bcrypt==3.2.0, blinker==1.4, certifi==2020.11.8, cffi==1.14.3, chardet==3.0.4, click==7.1.2, cyclo==0.10.0, decorator==4.4.2, dnspython==2.0.0, email_validator==1.1.2, floyd==3.3.2, idna==2.10, importlib_metadata==2.0.0, ipython_genutils==0.2.0, itsdangerous==1.1.0, jsonschema==3.2.0, jupyter_core==4.7.0, kiwisolver==1.3.1, matplotlib==3.0.2, mysqlclient==2.0.1, nbformat==5.0.8, numpy==1.16.4, pandas==0.24.1, pip==20.2.4, plotly==3.6.1, pycparser==2.20, pyparsing==2.4.7, pyrsistent==0.17.3, python_dateutil==2.8.1, pytz==2020.4, pywin32==300, requests==2.25.0, retrying==1.3.3, scipy==1.2.1, seaborn==0.9.0, setuptools==50.3.2, six==1.15.0, traitlets==4.3.3, urllib3==1.26.2, wheel==0.35.1, zipp==3.4.0
  activators BashActivator,BatchActivator,FishActivator,PowerShellActivator,PythonActivator,XonshActivator

C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST>
```

- b) Activation: (it is complete when you see a **(venv)** before the command line)

```
C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST>cd venv\Scripts
C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST\venv\Scripts>activate
(venv) C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST\venv\Scripts>
```

- c) Get to the previous directory

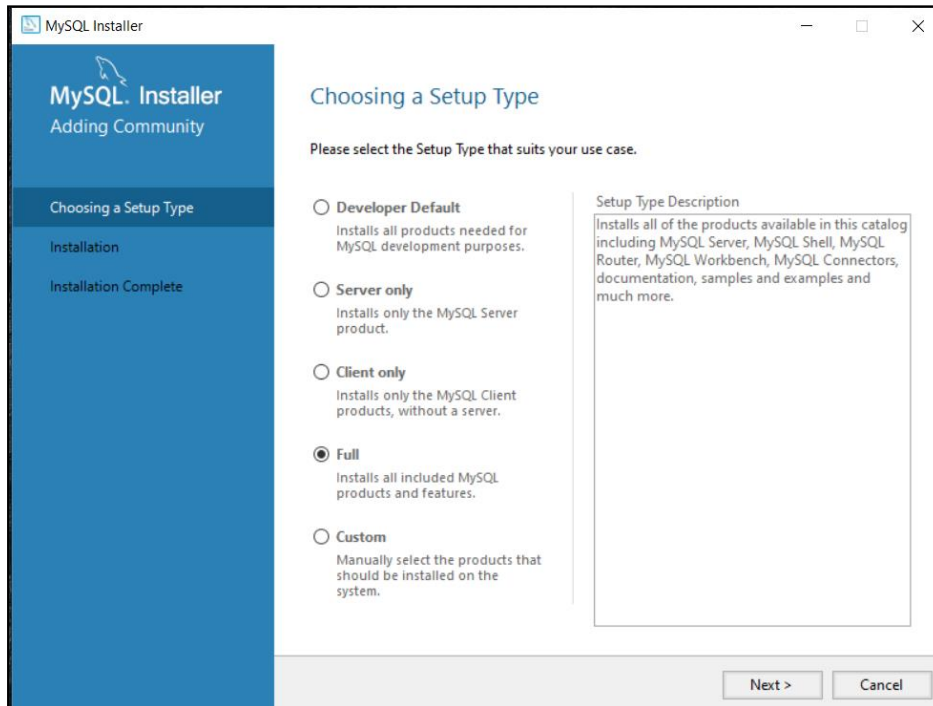
```
(venv) C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST\venv\Scripts>cd..
(venv) C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST\venv>cd..
(venv) C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST>
```

- d) Installation of dependencies (do not close this command line)

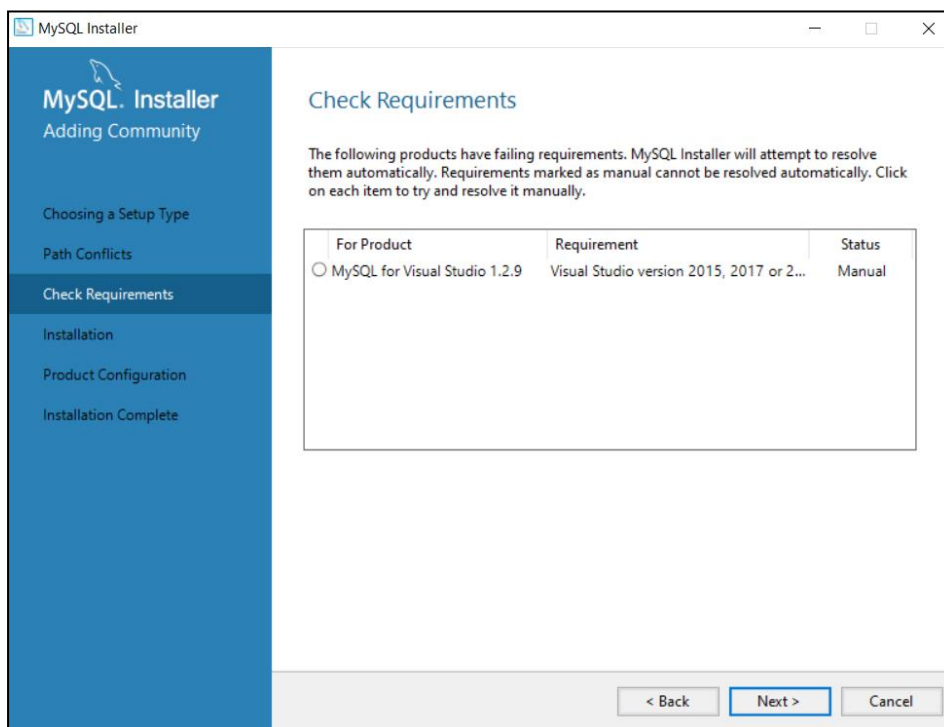
```
Command Prompt
(venv) C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST>pip install -r requirements.txt
```

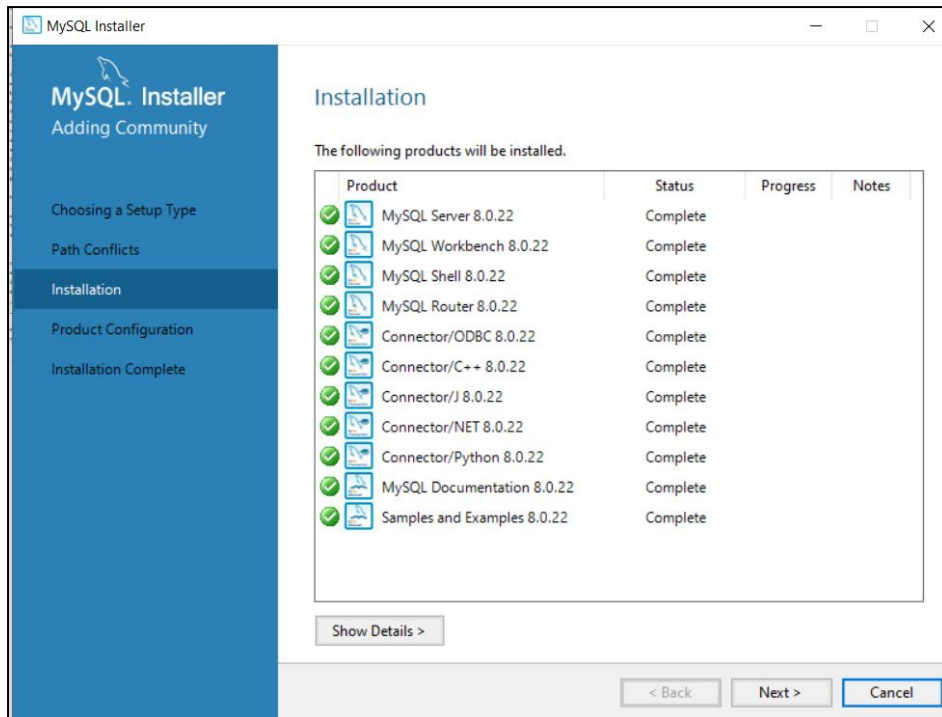
## 8. MySQL Setup

- a) Visit the webpage to download the installer file '<http://dev.mysql.com/downloads/installer/>'
- b) In the webpage, download the file that is about **400mb (the offline version)** in size and start the setup.
- c) Choosing a Setup type

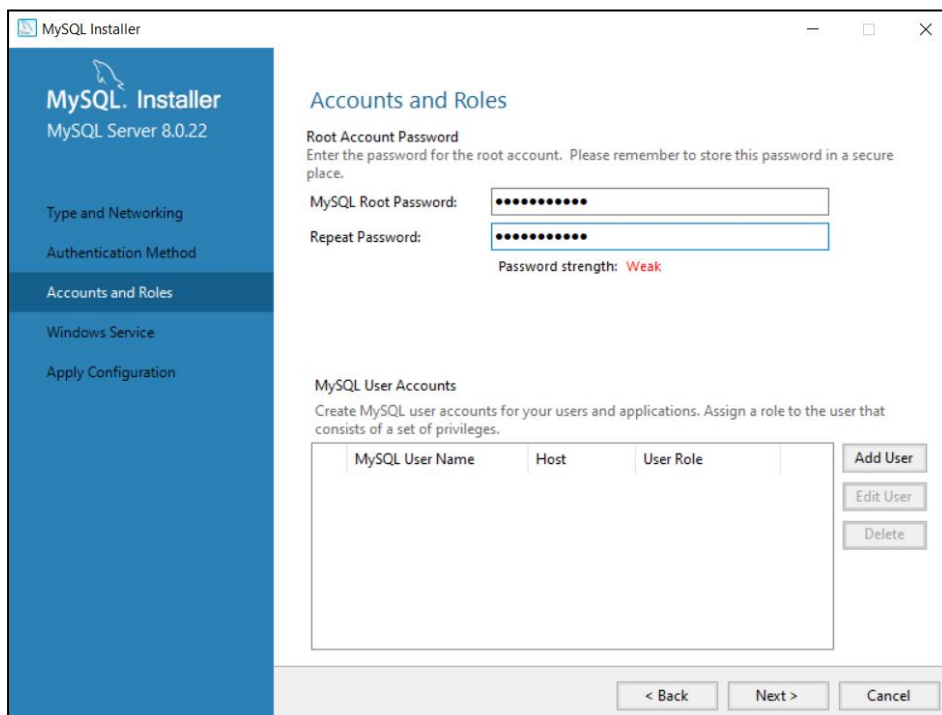


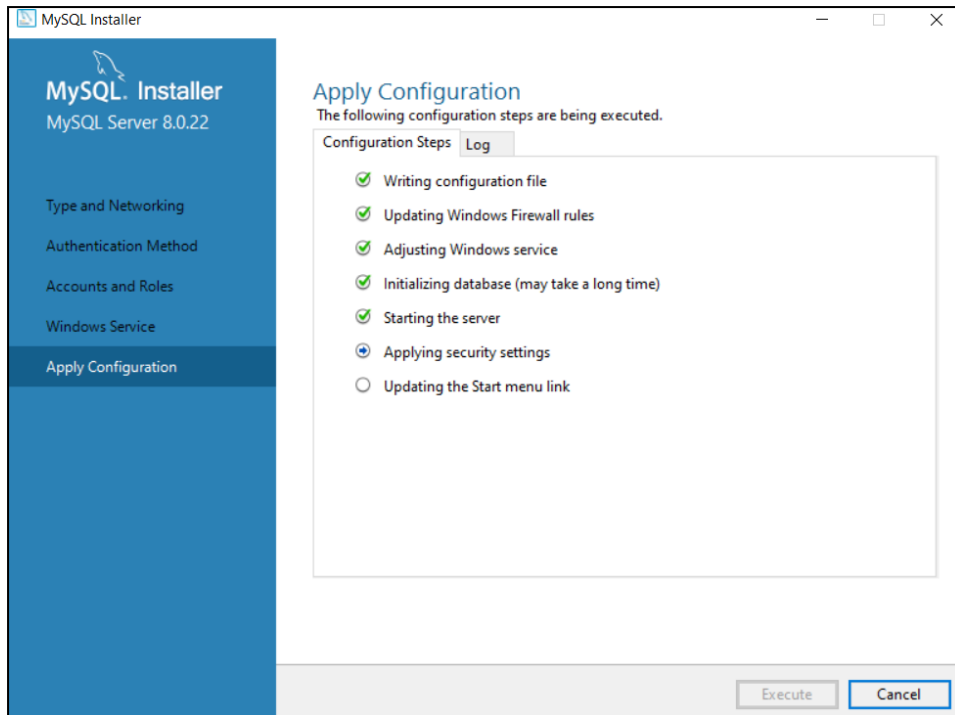
- d) Keep on going to the next steps by simply clicking next or execute. Please do not skip any steps though.



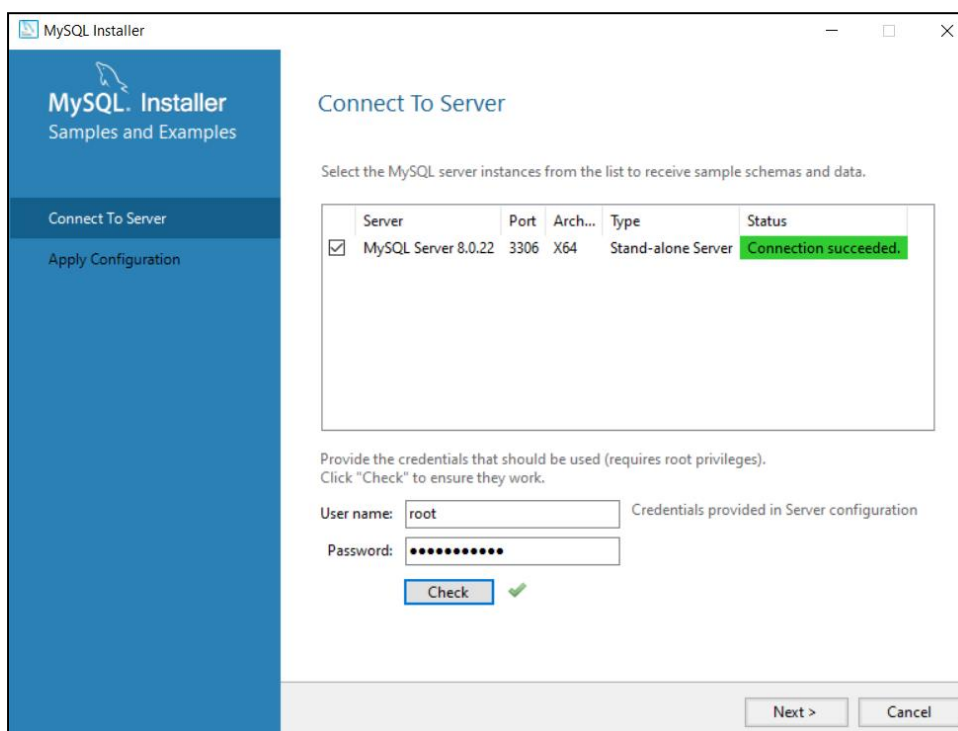


- e) Keep every option as is and continue until the account setting screen is obtained. Be sure to remember this password as in the next few steps, during application of configuration, we can check for the password if it is correct or not. Not to worry if it is weak.

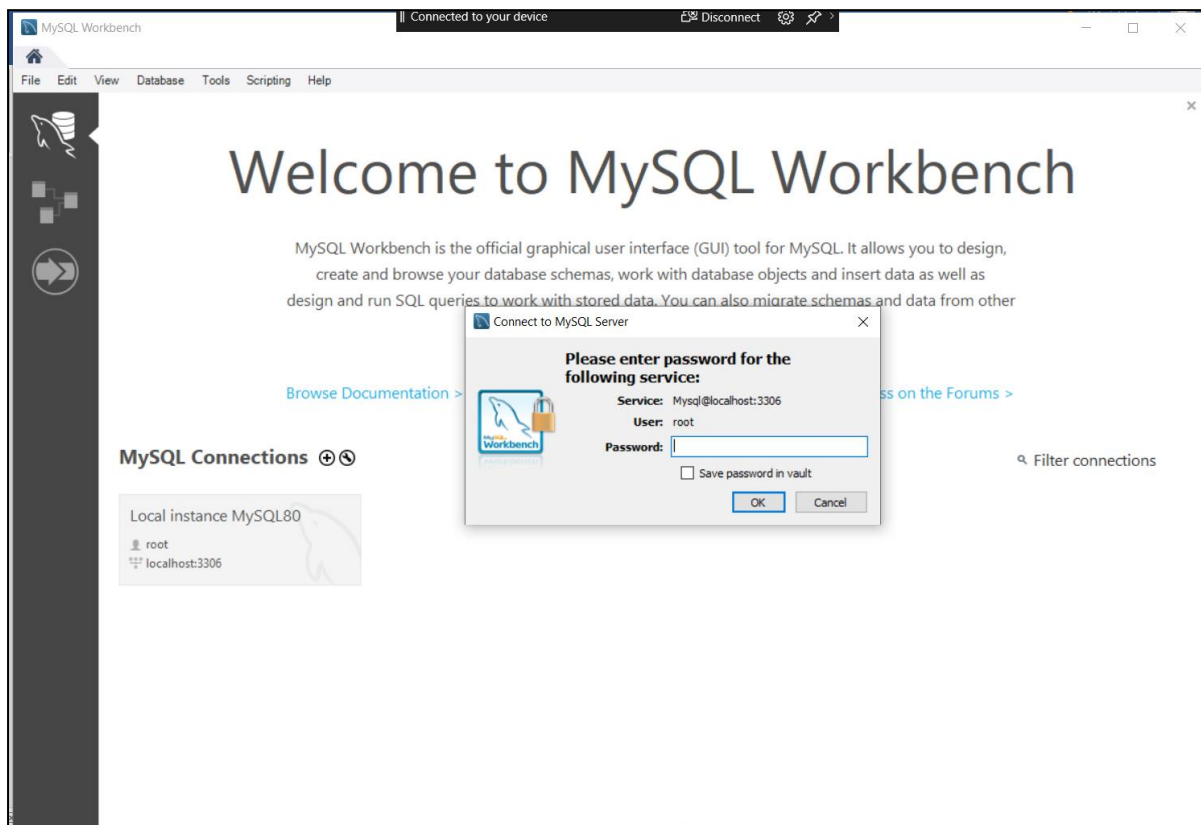
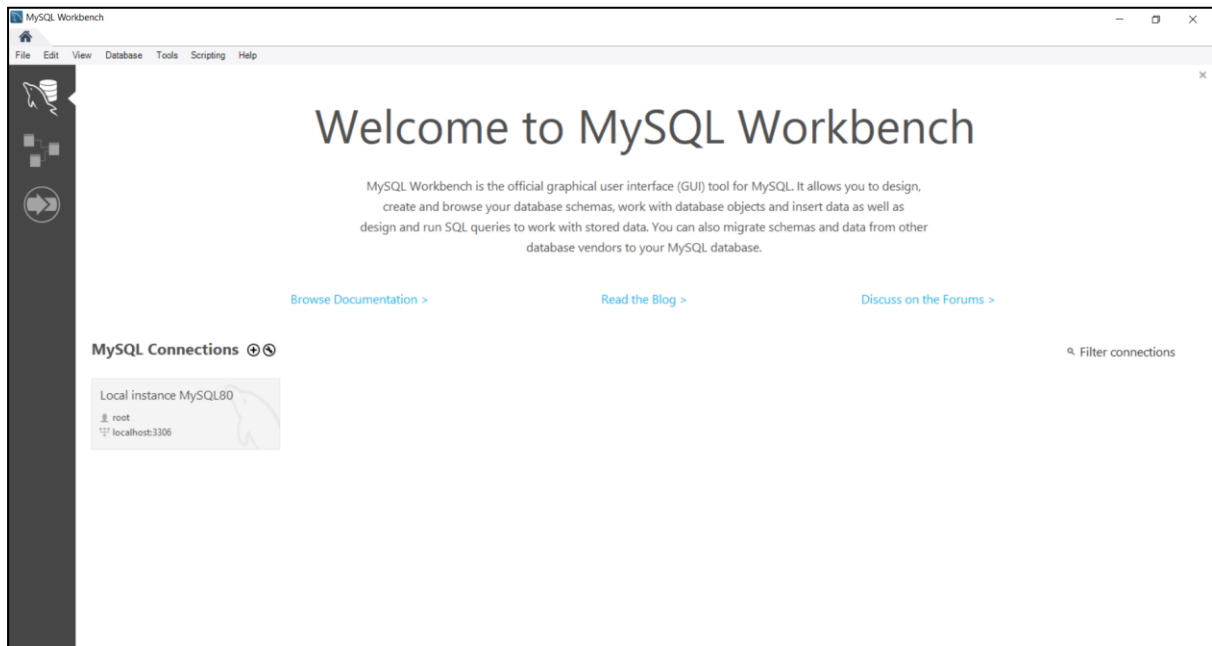




- f) Insert the password that has been created before and **click on check**. Then can go to the next step.

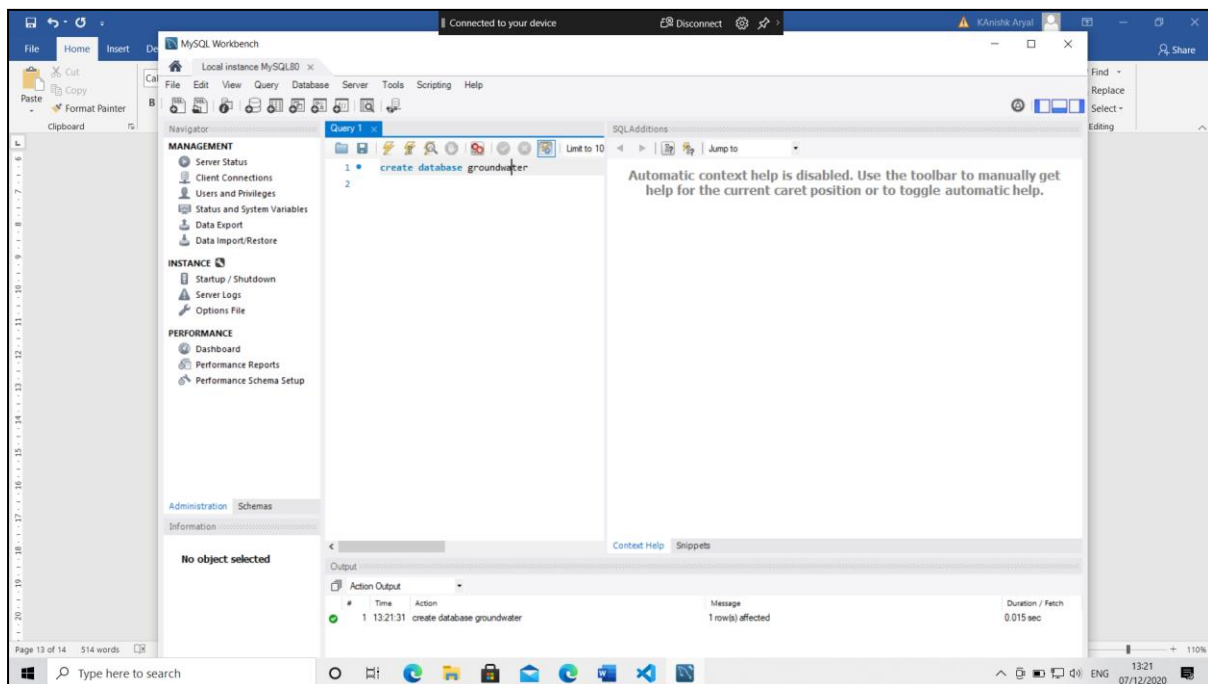
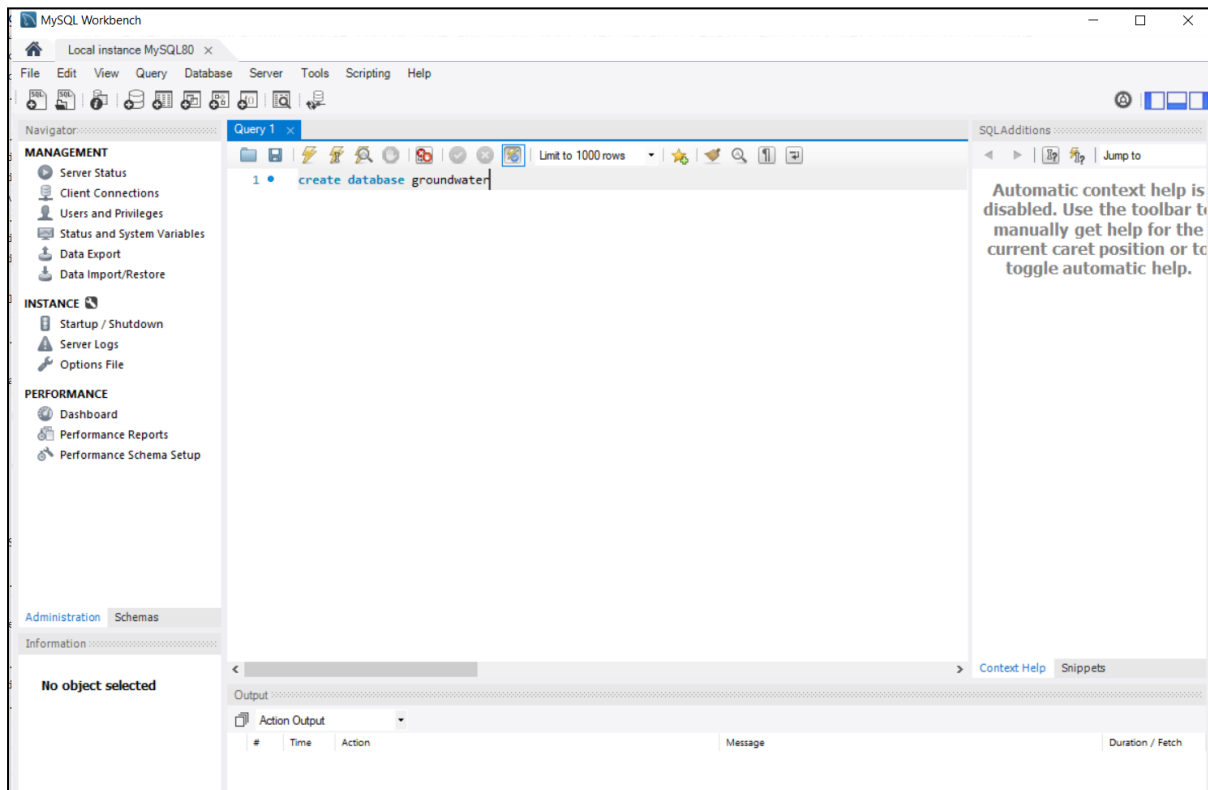


- g) After installation, you can open the MySQL software. Click on Connections and when asked, enter the **password** created during the setup.





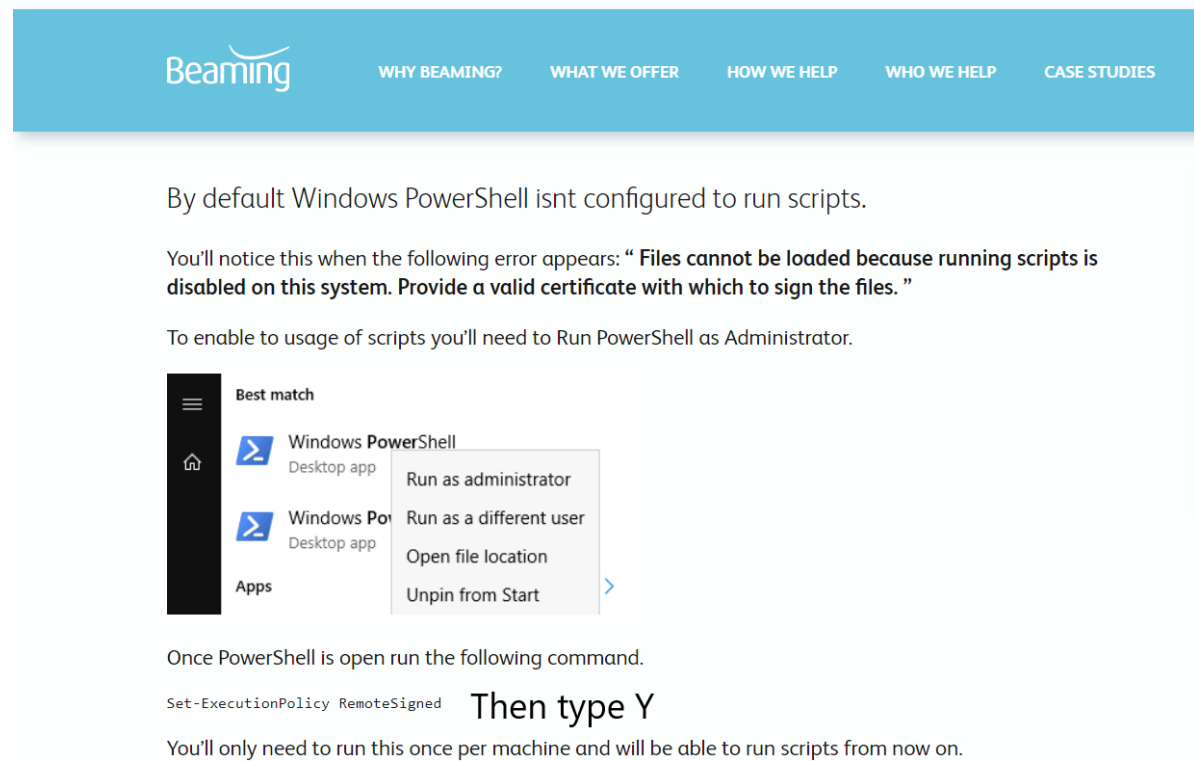
- h) Create a database named groundwater in the new page. '**create database groundwater**'. Click on the '**lightning button**' (It is used to execute), and wait until action is shown in the bottom.



9. Now populate your database with the command (python3create\_database.py or py create\_database.py) shown below in the command line that we kept open in step 7.d

```
(venv) C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST\venv\Scripts>python3 create_database.py  
(venv) C:\Users\49178.DESKTOP-S495UIR\Documents\GitHub\CAST\venv\Scripts>
```

10. In Window's system, don't forget to do this before you activate your project :



The screenshot shows the Beaming website header with navigation links: WHY BEAMING?, WHAT WE OFFER, HOW WE HELP, WHO WE HELP, and CASE STUDIES. The main content area has a heading "By default Windows PowerShell isn't configured to run scripts." followed by a quote: "Files cannot be loaded because running scripts is disabled on this system. Provide a valid certificate with which to sign the files." Below this, it says "To enable to usage of scripts you'll need to Run PowerShell as Administrator." A screenshot of the Windows Start menu search results for "Windows PowerShell" is shown, with the context menu open and "Run as administrator" selected. Below the screenshot, it says "Once PowerShell is open run the following command." followed by the command "Set-ExecutionPolicy RemoteSigned" and "Then type Y". Finally, it says "You'll only need to run this once per machine and will be able to run scripts from now on."

By default Windows PowerShell isn't configured to run scripts.

You'll notice this when the following error appears: "Files cannot be loaded because running scripts is disabled on this system. Provide a valid certificate with which to sign the files."

To enable to usage of scripts you'll need to Run PowerShell as Administrator.

Once PowerShell is open run the following command.

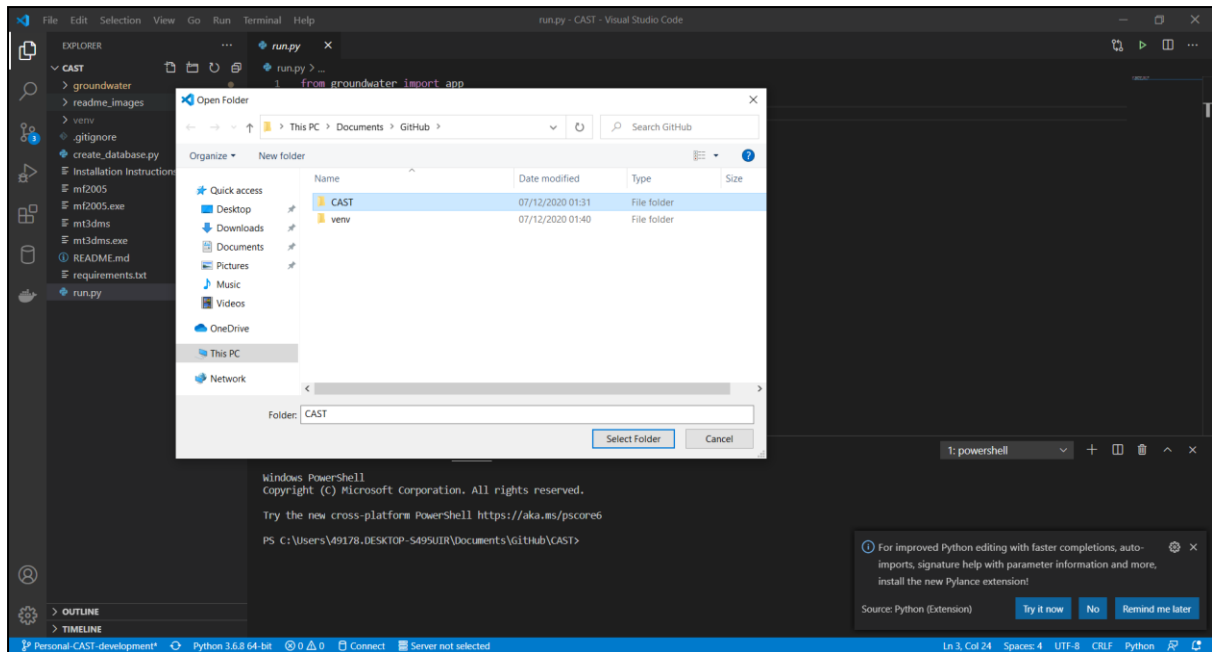
```
Set-ExecutionPolicy RemoteSigned
```

Then type Y

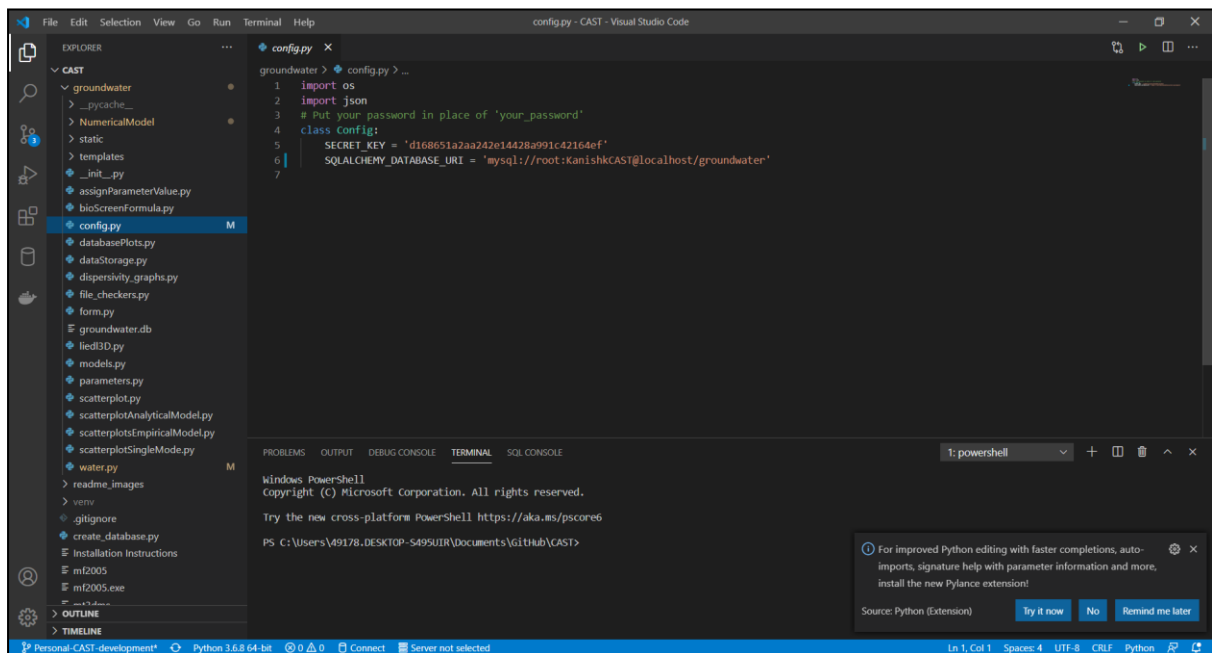
You'll only need to run this once per machine and will be able to run scripts from now on.

Reference : <https://www.beaming.co.uk/knowledge-base/resolved-files-cannot-loaded-running-scripts-disabled-system/>

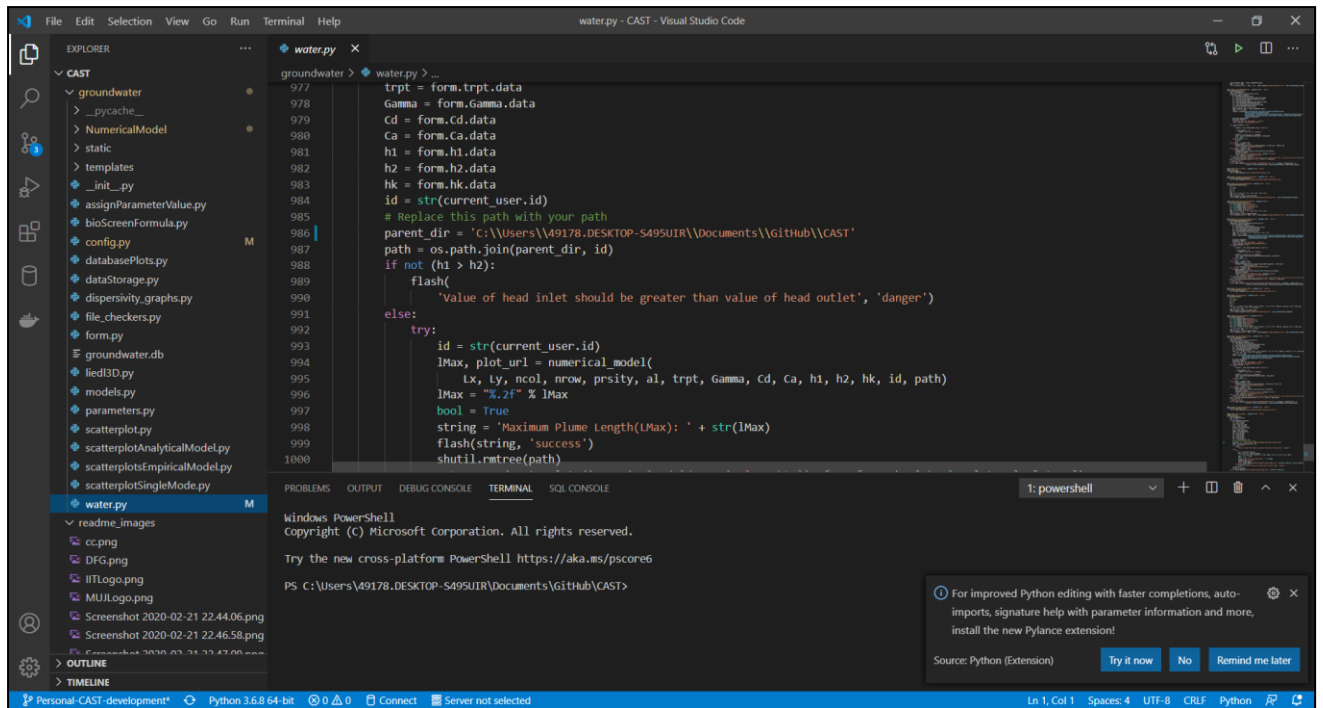
11. In Visual Studio Code, open the file location; here select **CAST** and click on **Select Folder**.  
(Note: it is not a compulsion to run via Visual Code, there are other softwares like Pycharm which can also be alternately used. You can also simply run via the command line as well).



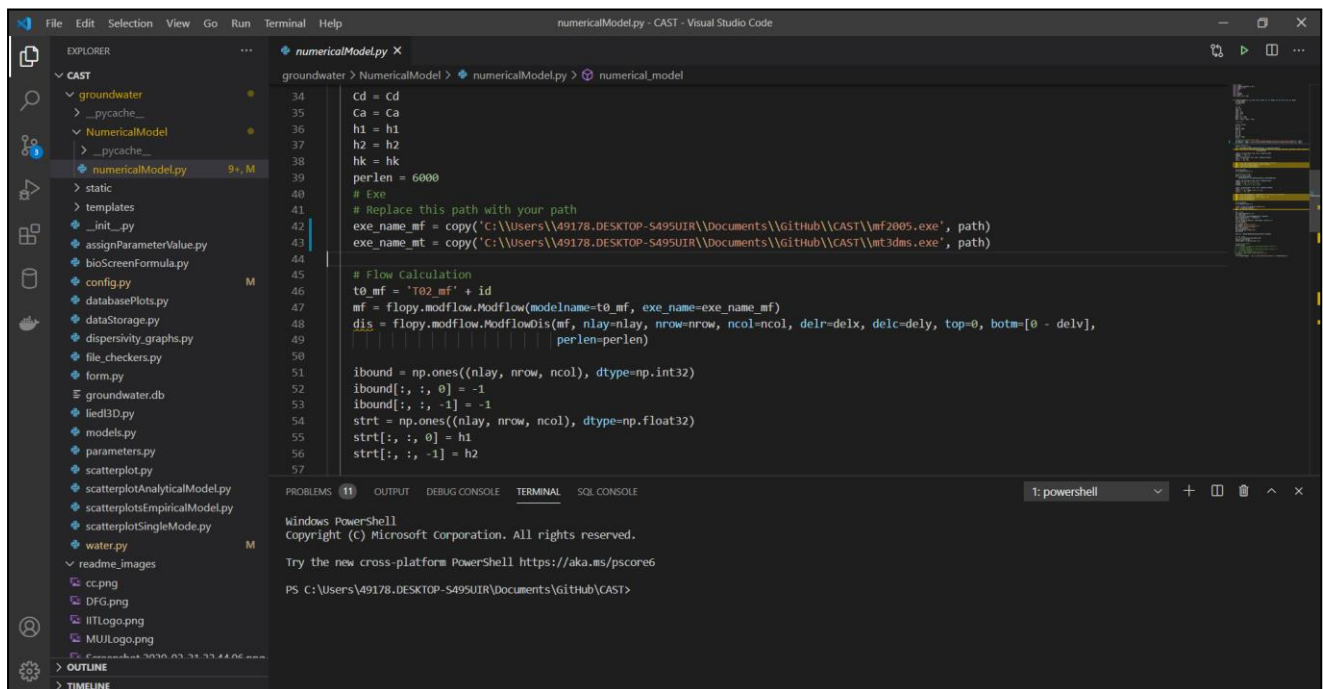
12. Under **groundwater>config.py**, change the password to your password used before during the setup .



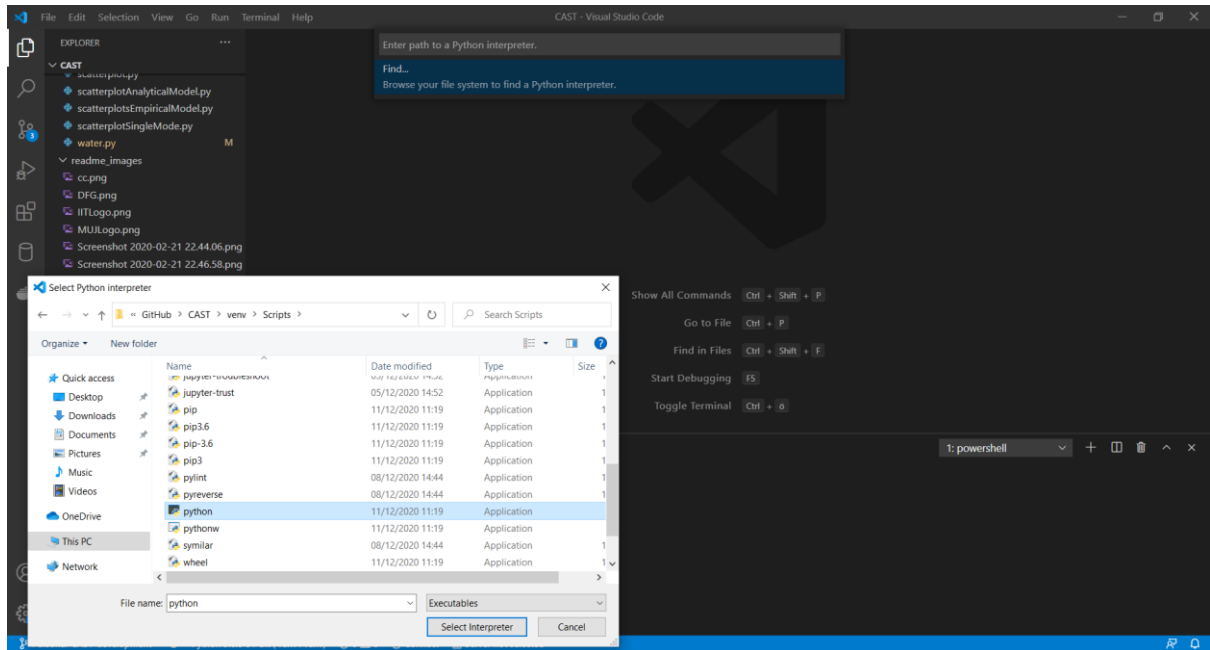
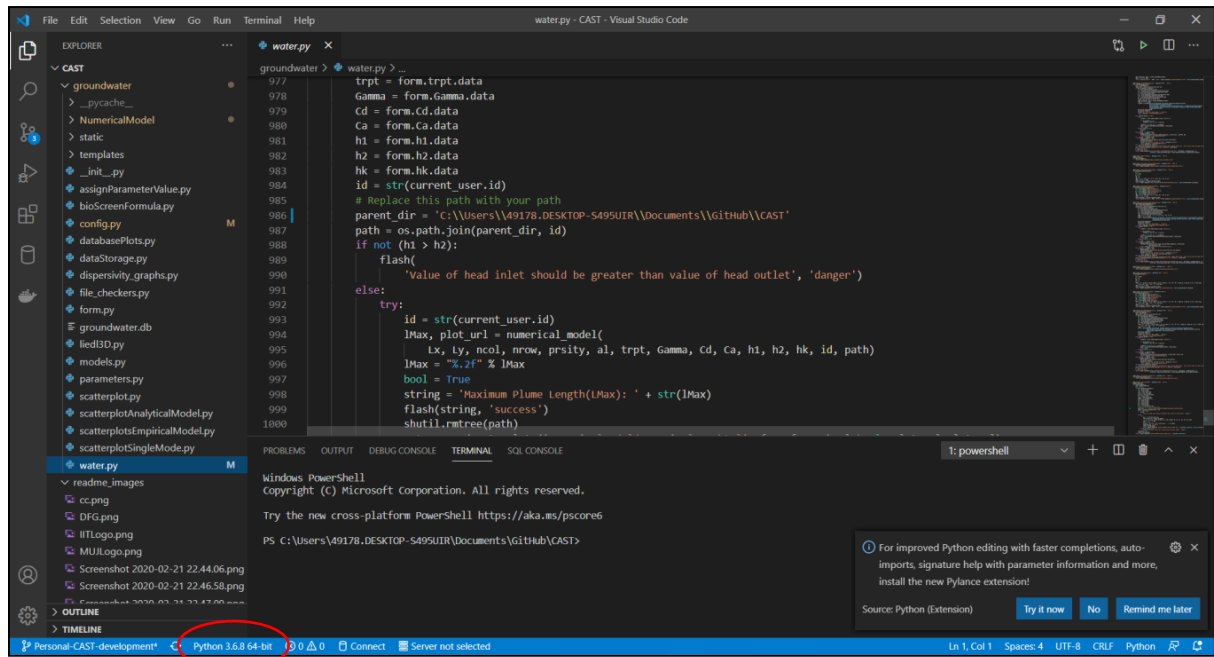
13. Under **groundwater/water.py**, change the **parent\_dir= 'your directory\\CAST'**

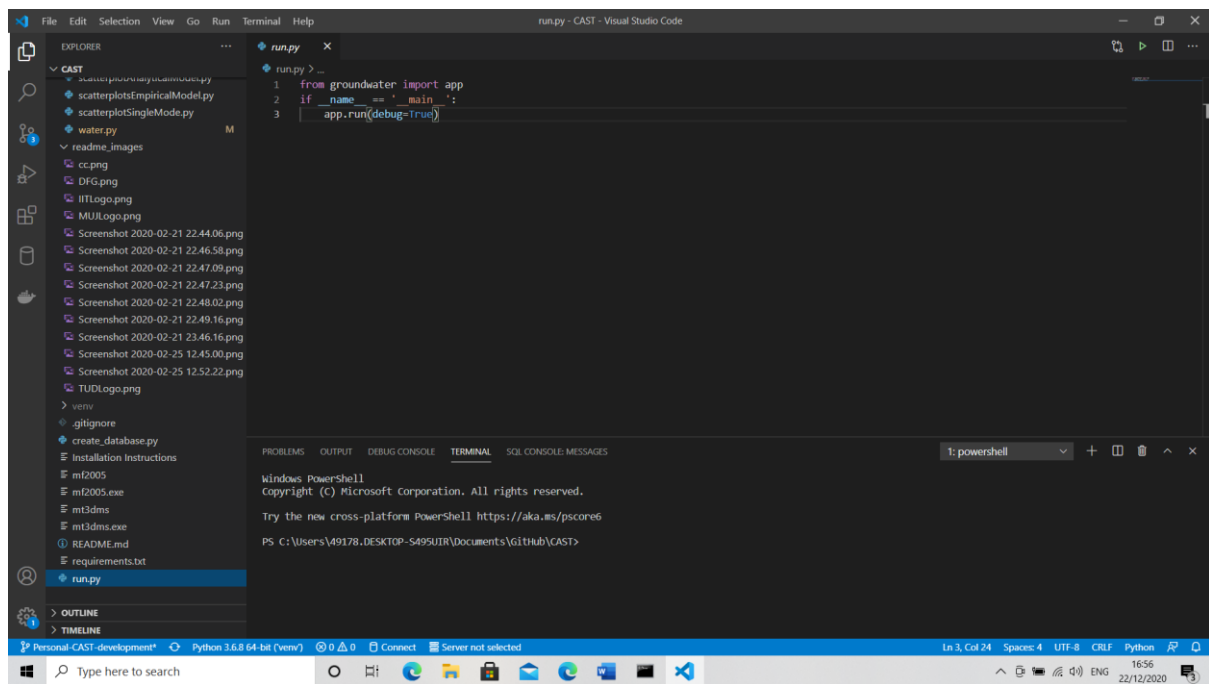


14. Under **groundwater/NumericalModel/numericalModel.py** change the following:

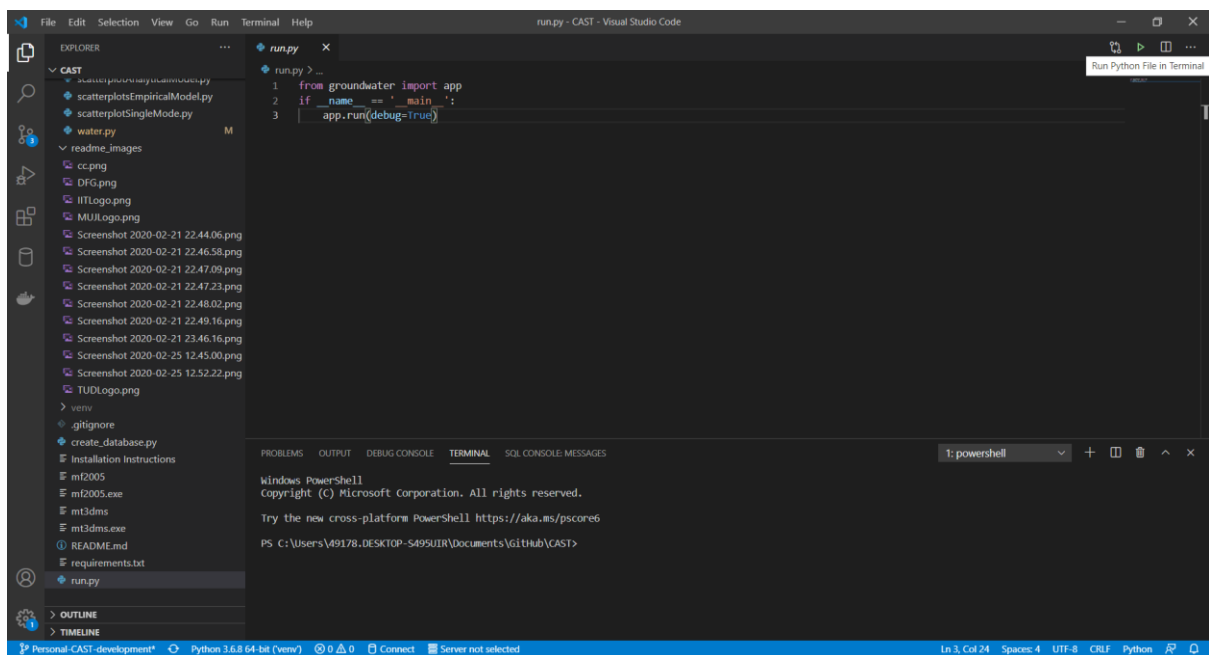


15. Click on the interpreter below and select the python interpreter -> virtual environment that you want to work in

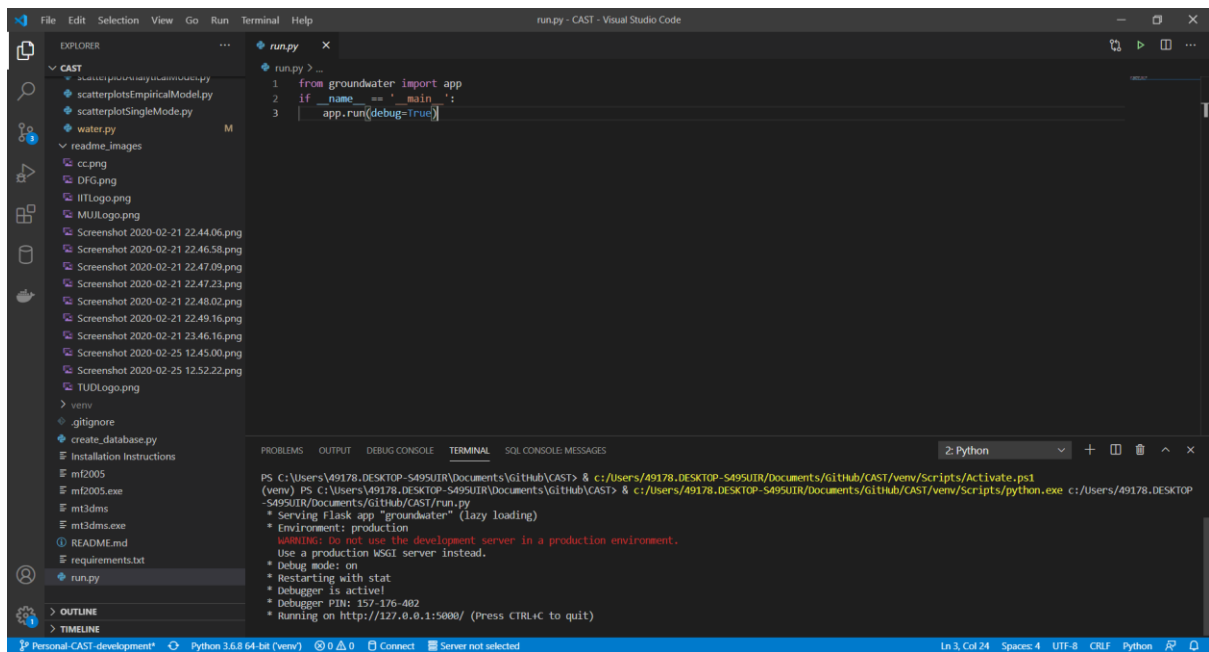




16. Go to **run.py** and on the top right corner click on the **green play button** to run.



## 17. Click on the link to get to the CAST Webpage

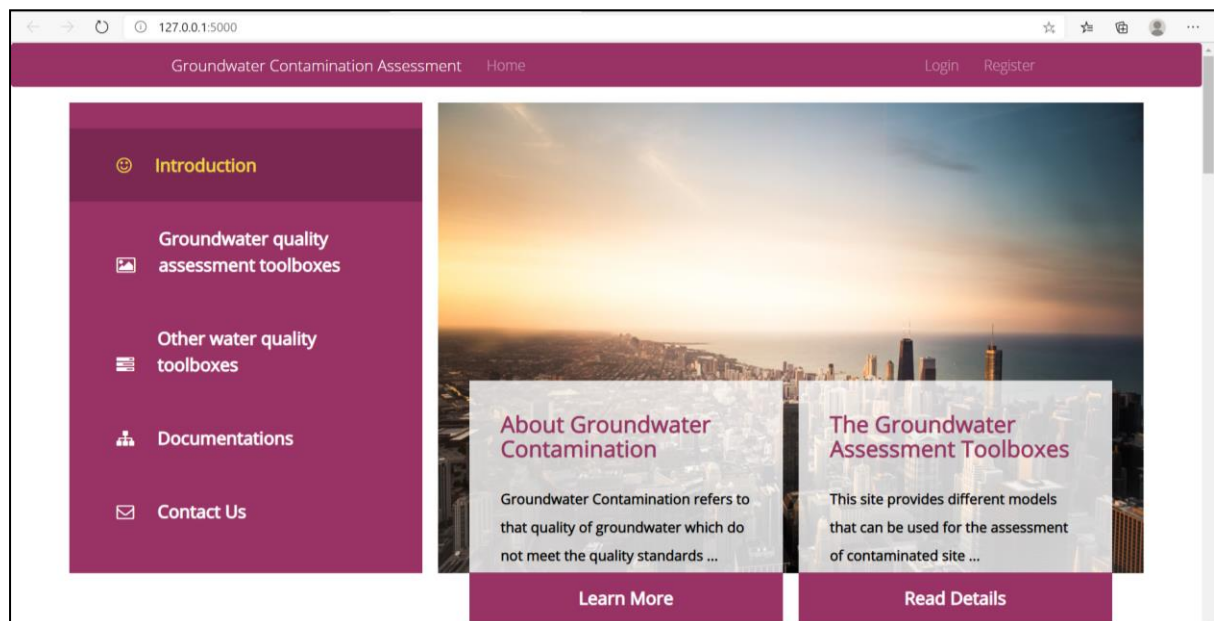


The screenshot shows the Visual Studio Code interface with the CAST project open. The Explorer pane on the left lists files including `run.py`. The main editor shows the content of `run.py`:

```
1 from groundwater import app
2 if __name__ == '__main__':
3     app.run(debug=True)
```

The terminal at the bottom shows the command to run the script and its output:

```
PS C:\Users\49178-DESKTOP-S495UIR\Documents\Github\CAST> & c:/Users/49178-DESKTOP-S495UIR/venv/scripts/activate.ps1
(venv) PS C:\Users\49178-DESKTOP-S495UIR\Documents\Github\CAST> & c:/Users/49178-DESKTOP-S495UIR/venv/scripts/python.exe c:/Users/49178-DESKTOP-S495UIR/venv/scripts/python.exe c:/Users/49178-DESKTOP-S495UIR/venv/scripts/python.exe c:/Users/49178-DESKTOP-S495UIR/venv/scripts/python.exe
* Serving Flask app "groundwater" (lazy loading)
* Environment: production
  WARNING: Do not use the development server in a production environment.
  Use a production WSGI server instead.
* Debug mode: on
* Restarting with stat
* Debugger is active!
* Debugger PIN: 157-176-402
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```



You can log in with your email ID and a password. If you wish to close the server simply Hold **Ctrl+C** to stop the server from running.

From the next time, to run the CAST webpage, all that is required is to open Visual Studio Code and follow from the **Step 16**.