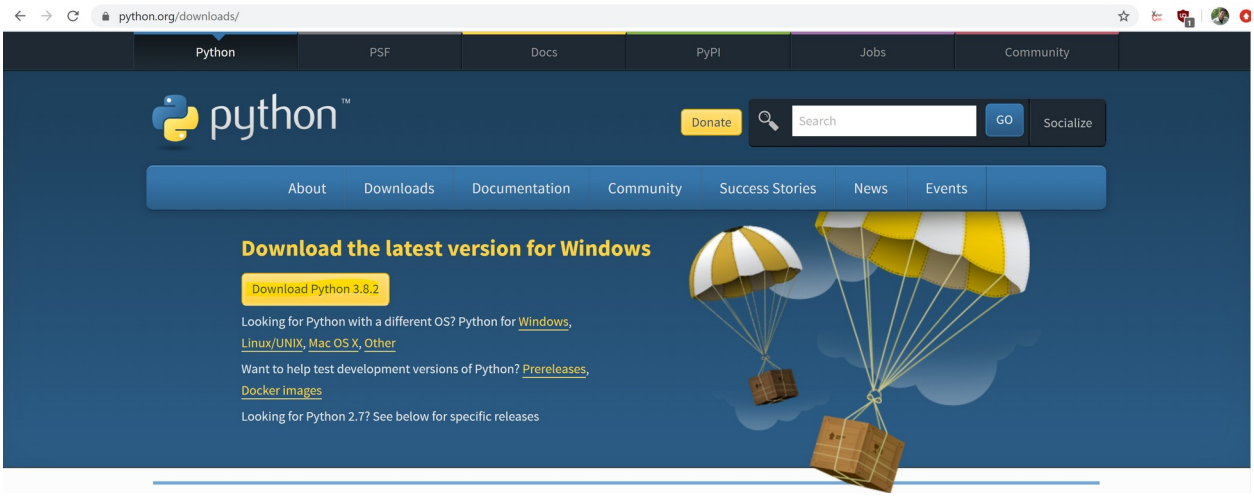
Python : Programmatically Health Check Web URLS and API's

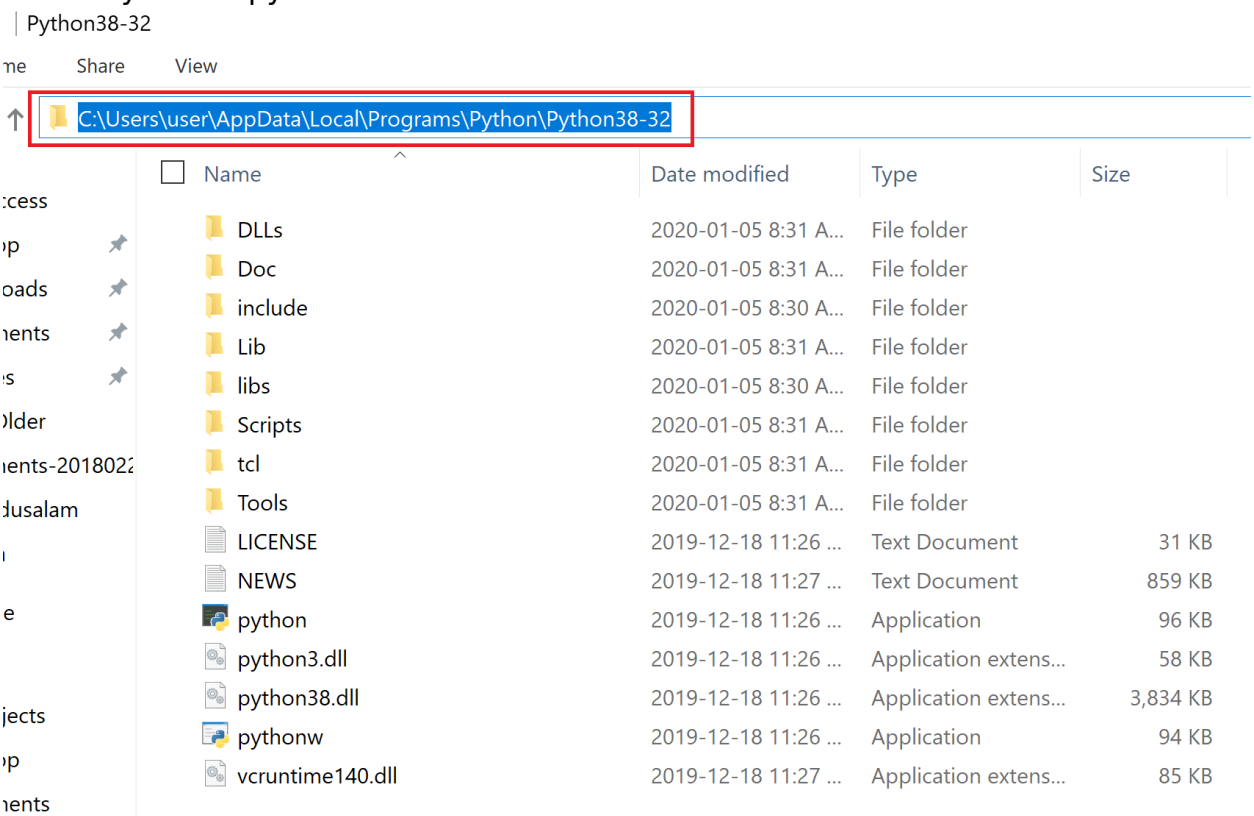
Installations & Setup Steps:

1. Install python from here https://www.python.org/downloads/

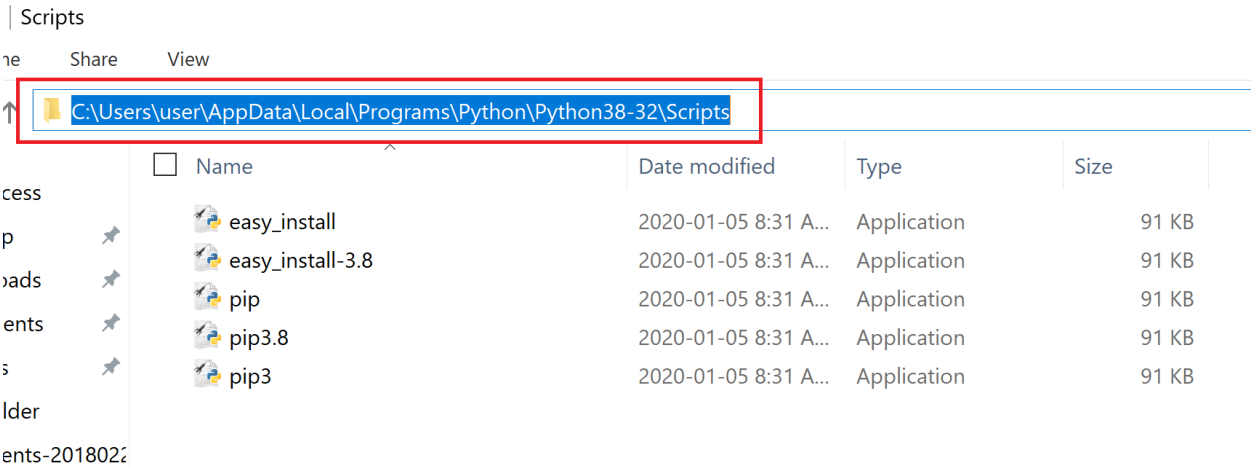


2. Set paths for python directory and scripts where pip is in windows environment variables

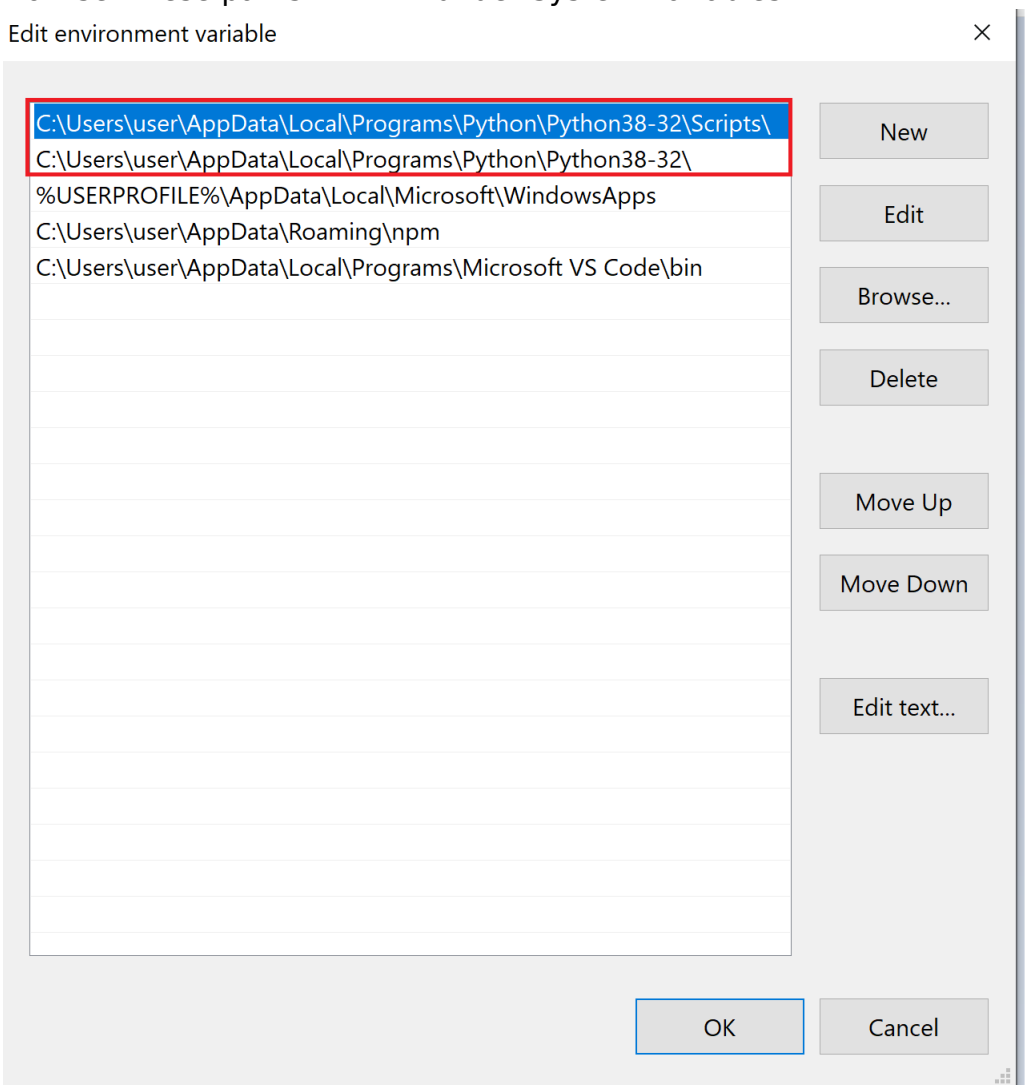
   Directory where python is installed:



Directory where scripts like pip are :

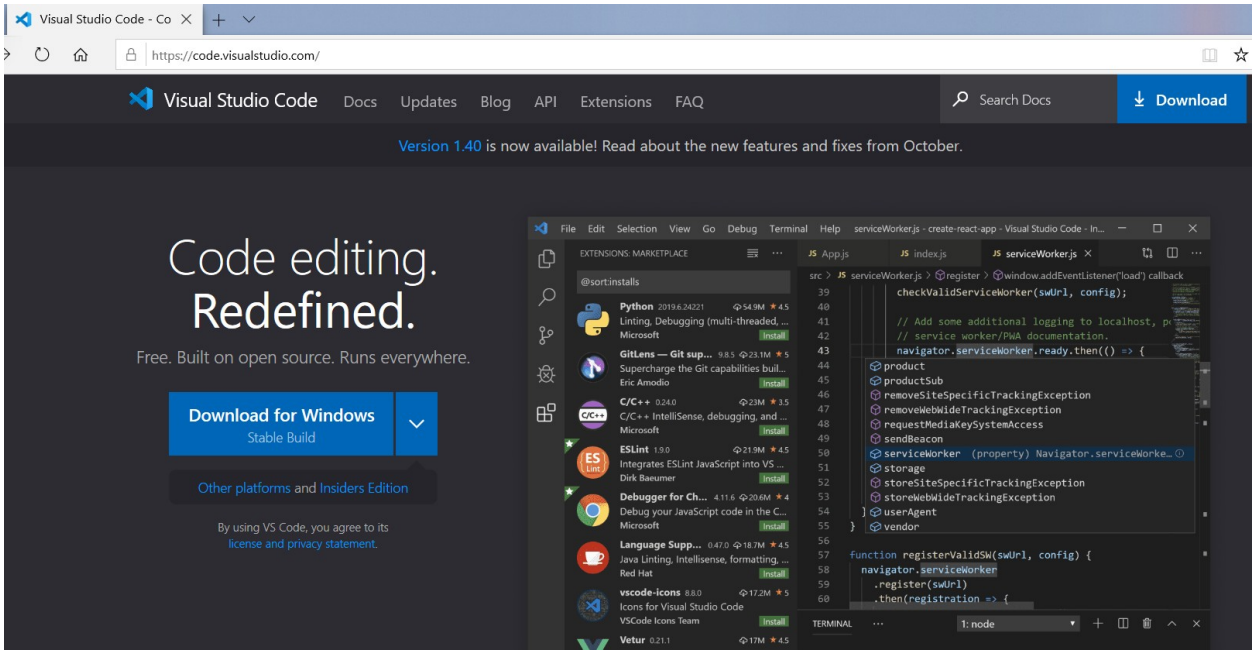


Now set these paths in PATH under System variables:

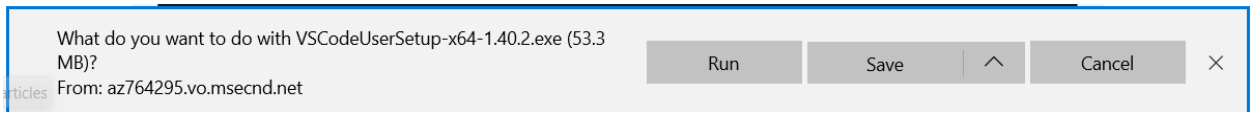


3. IDE – Visual Studio Code Installation

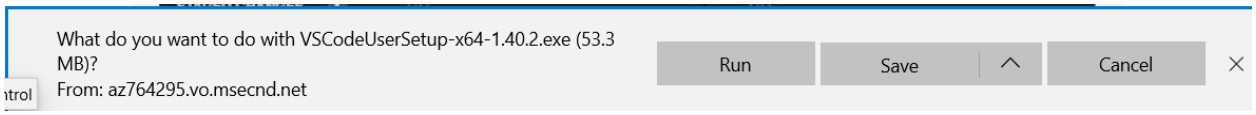
Go to https://code.visualstudio.com/ . Click Download for Windows



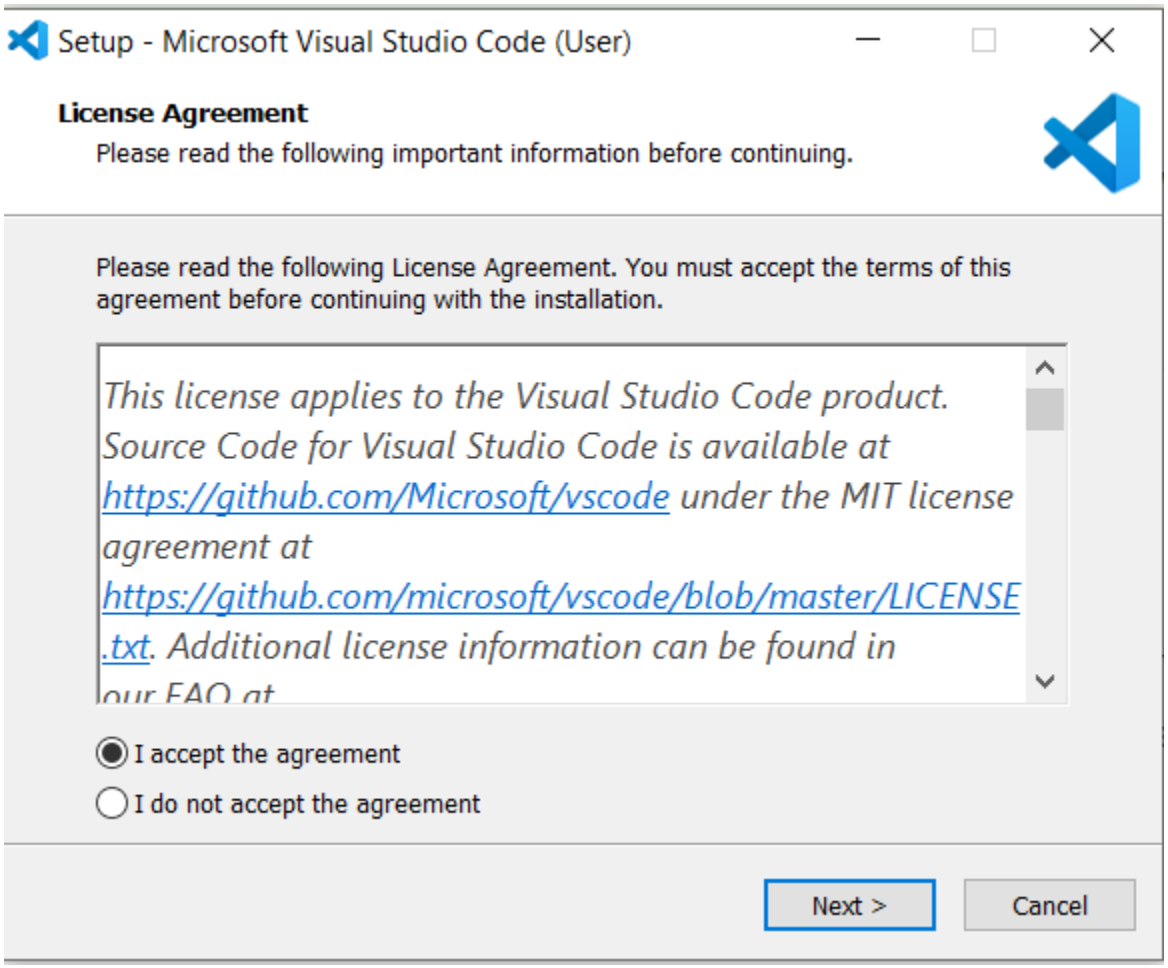
Click Save



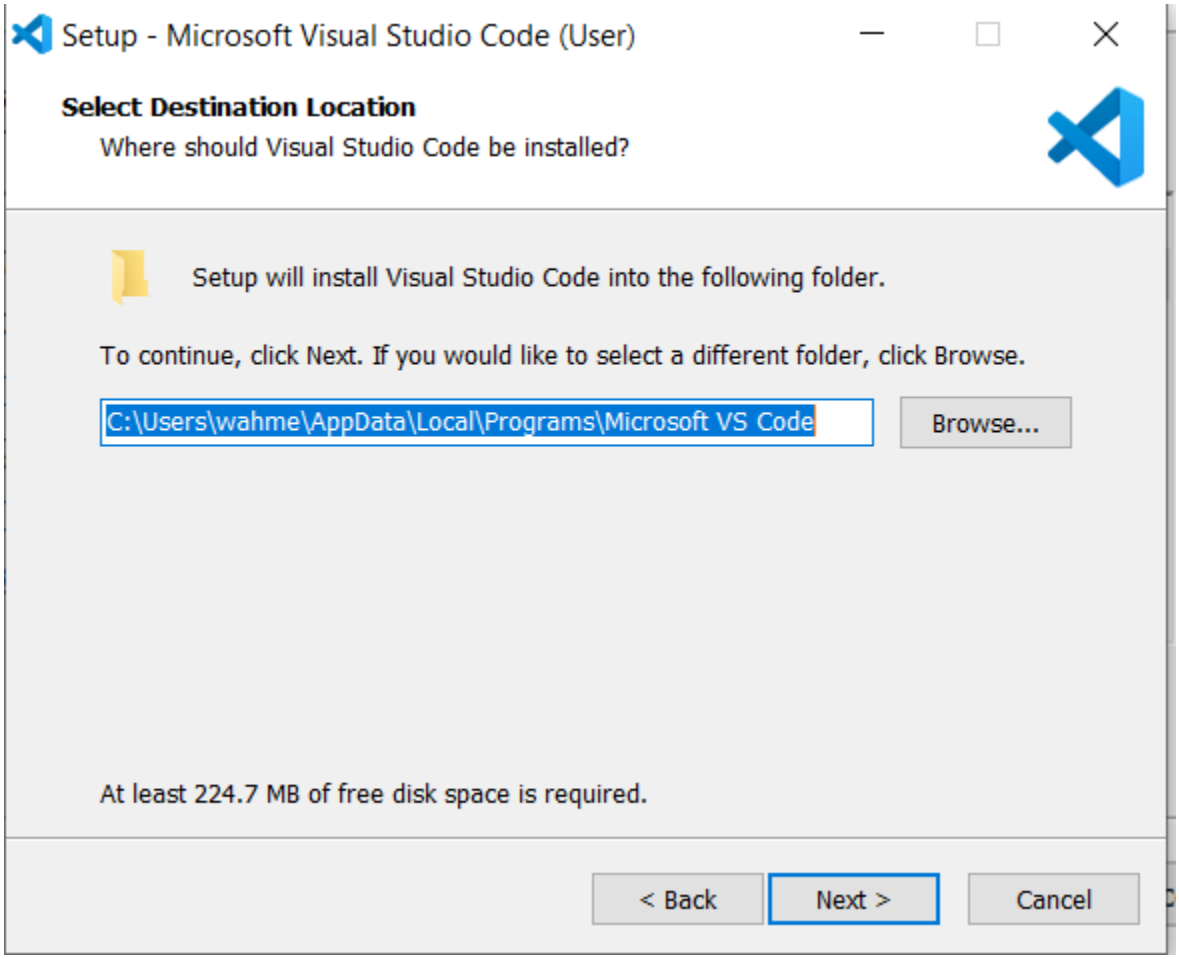
Click Run



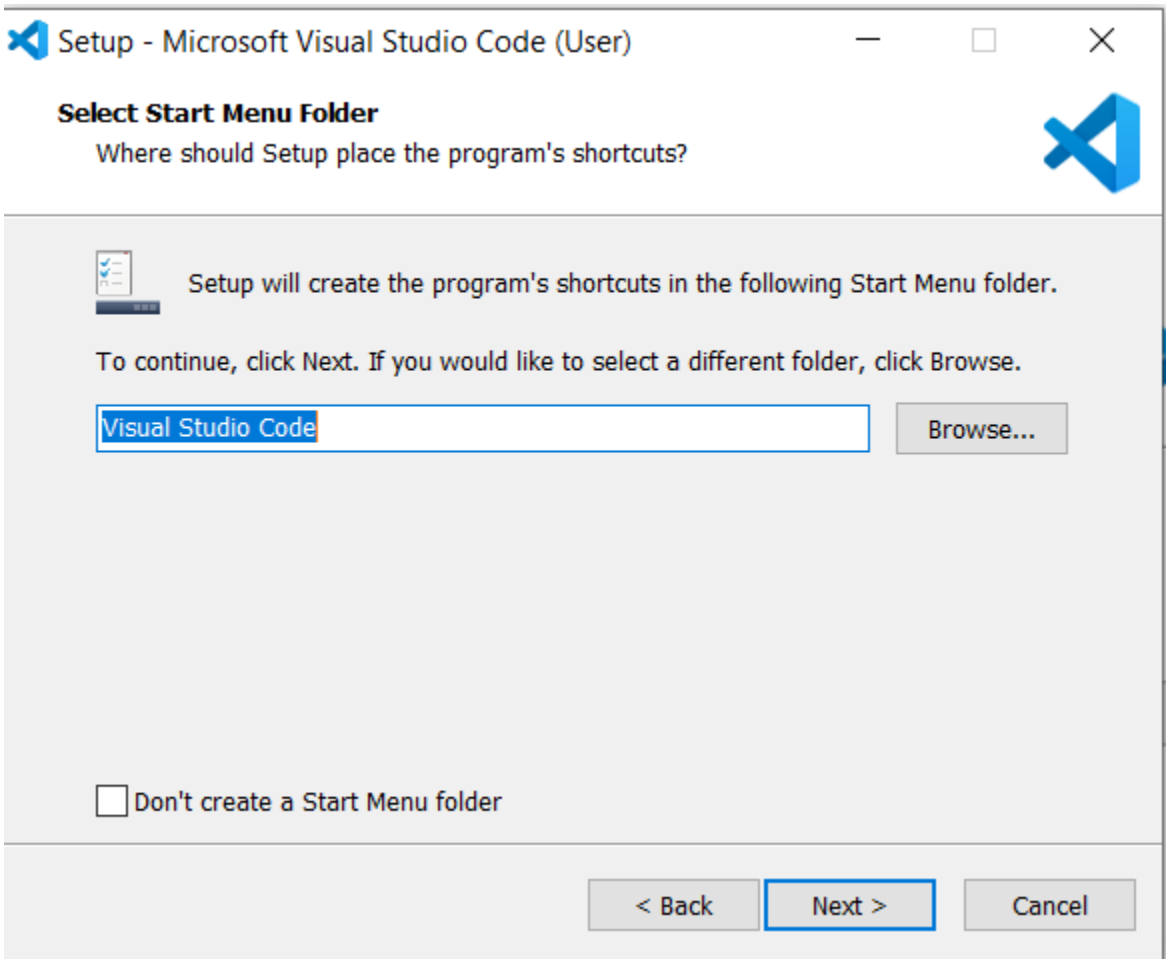
Select “I accept the agreement”. Than Click Next


Setup - Microsoft Visual Studio Code (User)
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
This license applies to the Visual Studio Code product. Source Code for Visual Studio Code is available at https://github.com/Microsoft/vscode under the MIT license agreement at https://github.com/microsoft/vscode/blob/master/LICENSE.txt. Additional license information can be found in
I accept the agreement
I do not accept the agreement
Next >
Cancel

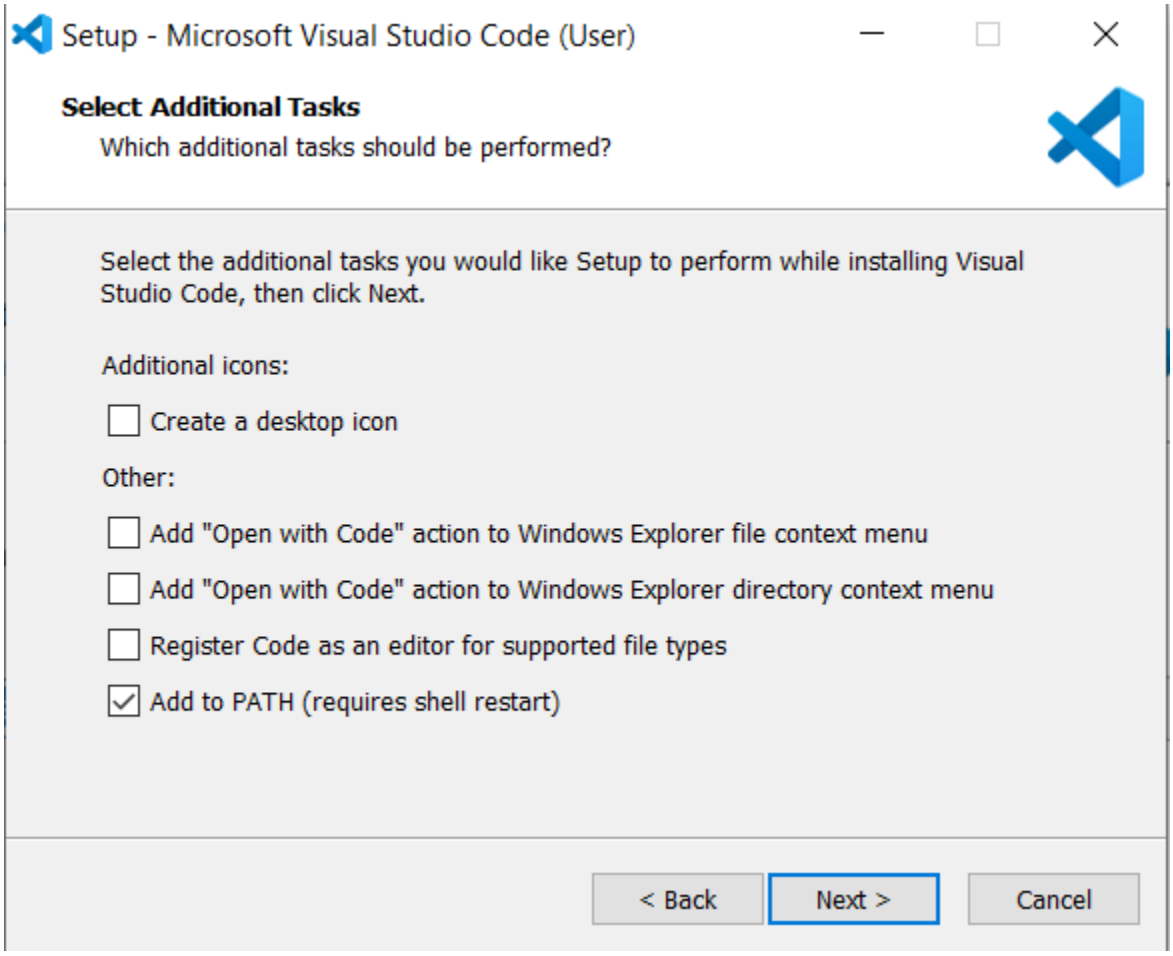
Click Next


Setup - Microsoft Visual Studio Code (User)
Select Destination Location
Where should Visual Studio Code be installed?
Setup will install Visual Studio Code into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Users\wahme\AppData\Local\Programs\Microsoft VS Code
Browse...
At least 224.7 MB of free disk space is required.
< Back
Next >
Cancel

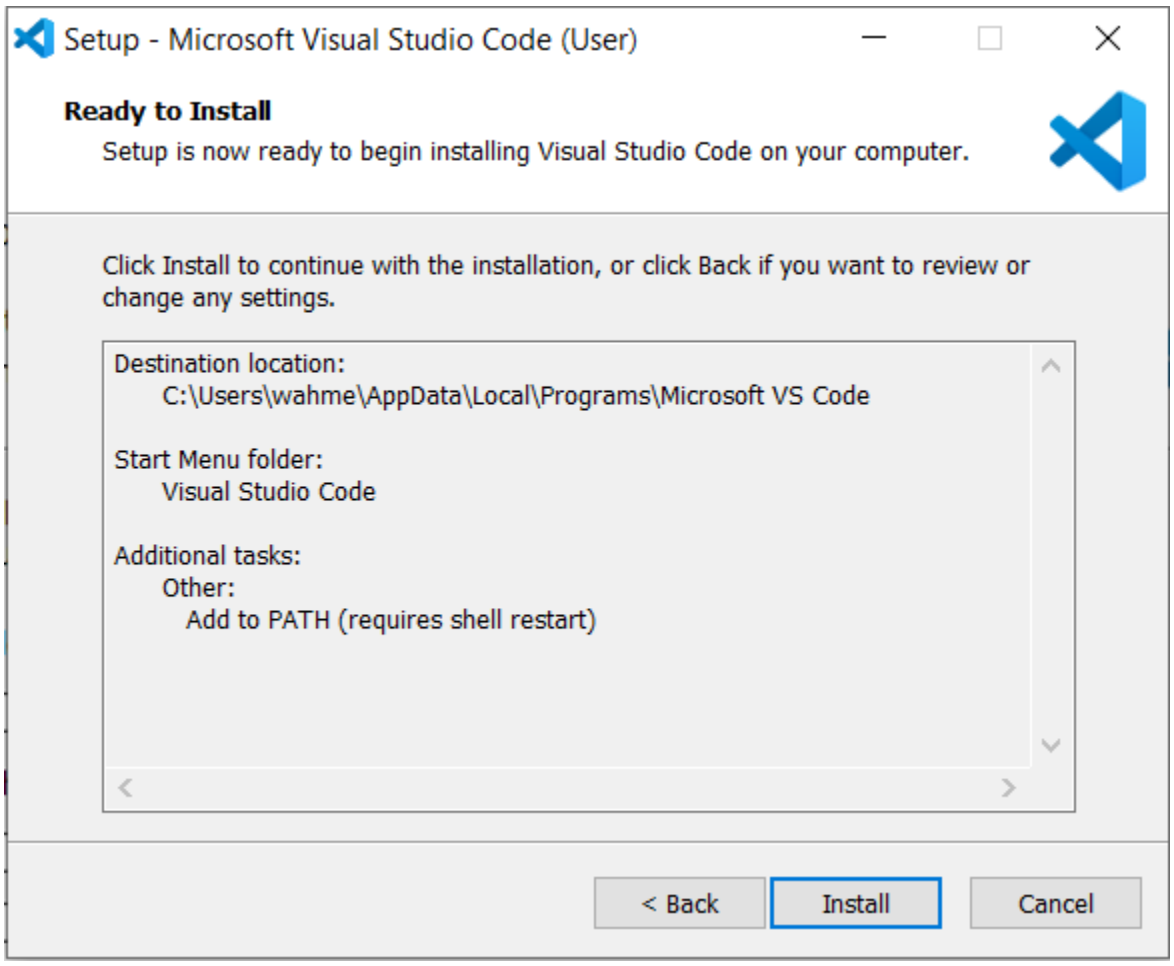
Click Next

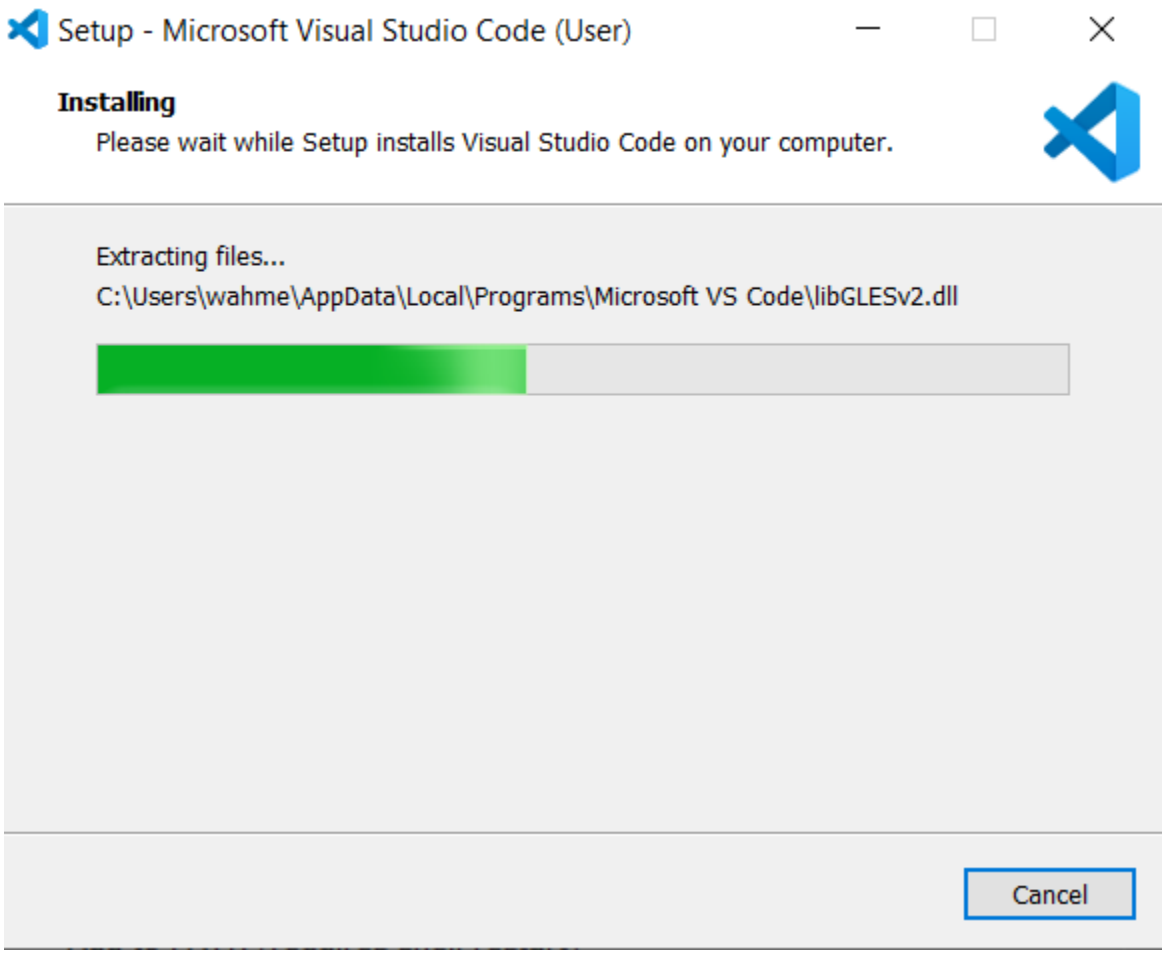

Setup - Microsoft Visual Studio Code (User)
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
Visual Studio Code
Browse...
Don't create a Start Menu folder
< Back
Next >
Cancel

Click Next

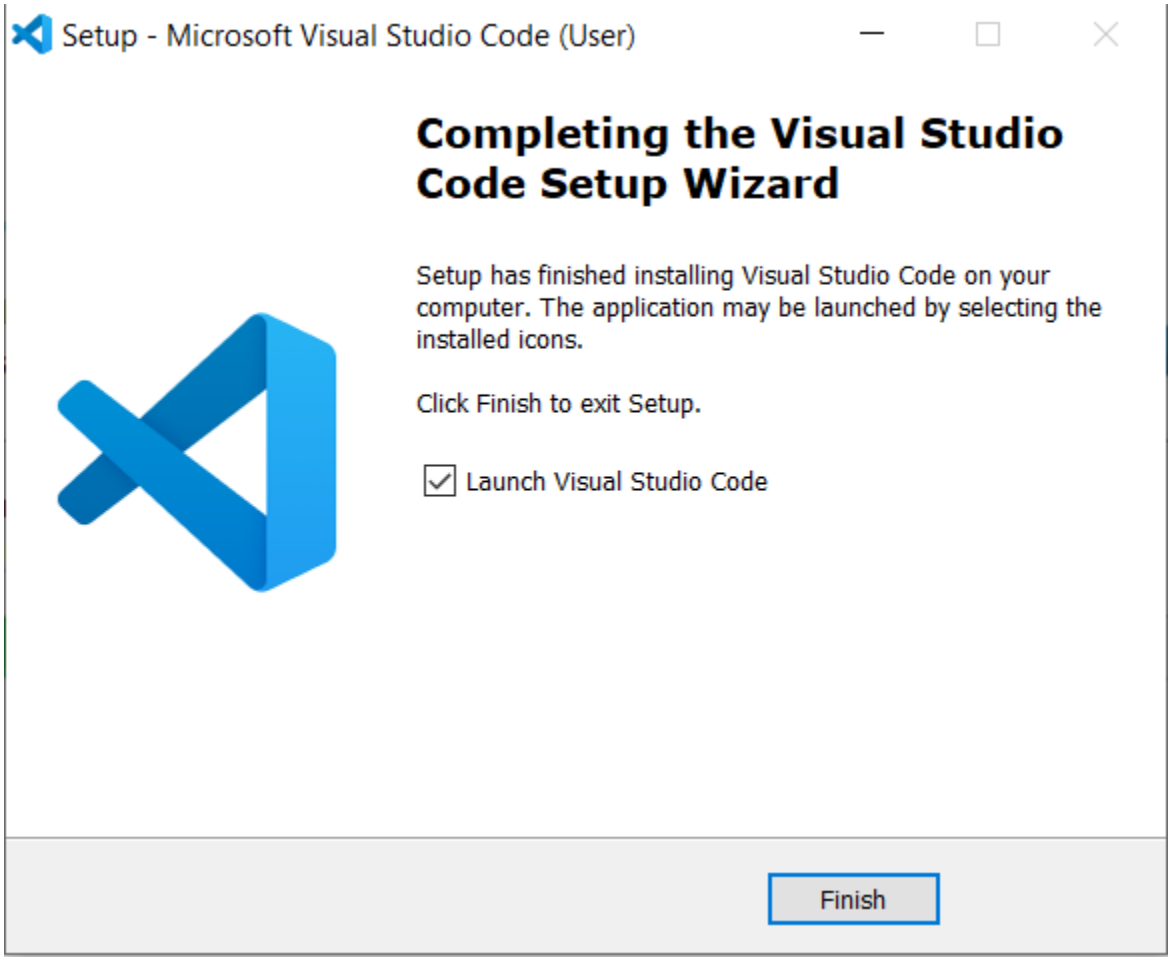


Click Install


Setup - Microsoft Visual Studio Code (User)
Ready to Install
Setup is now ready to begin installing Visual Studio Code on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Users\wahme\AppData\Local\Programs\Microsoft VS Code
Start Menu folder:
Visual Studio Code
Additional tasks:
Other:
Add to PATH (requires shell restart)
< Back
Install
Cancel

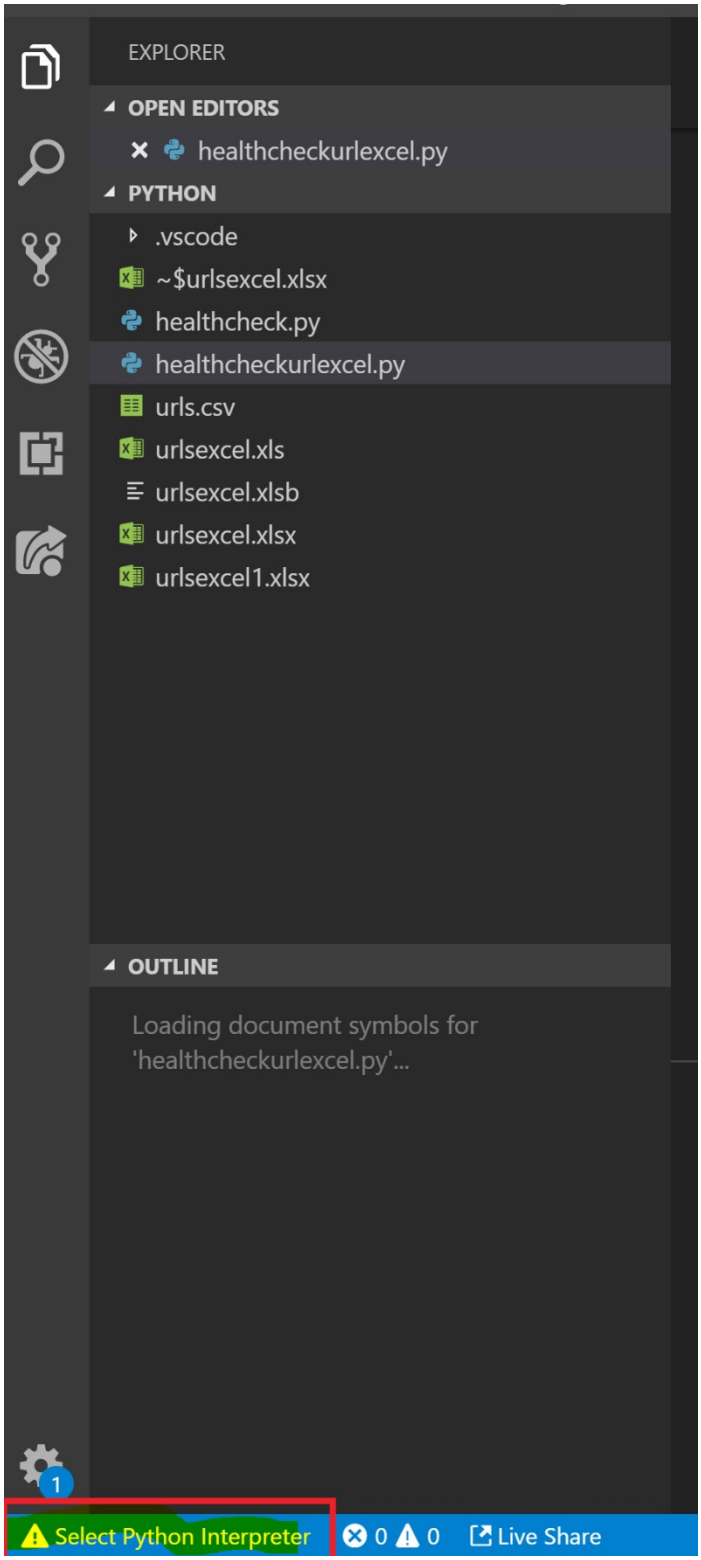


Click Finish

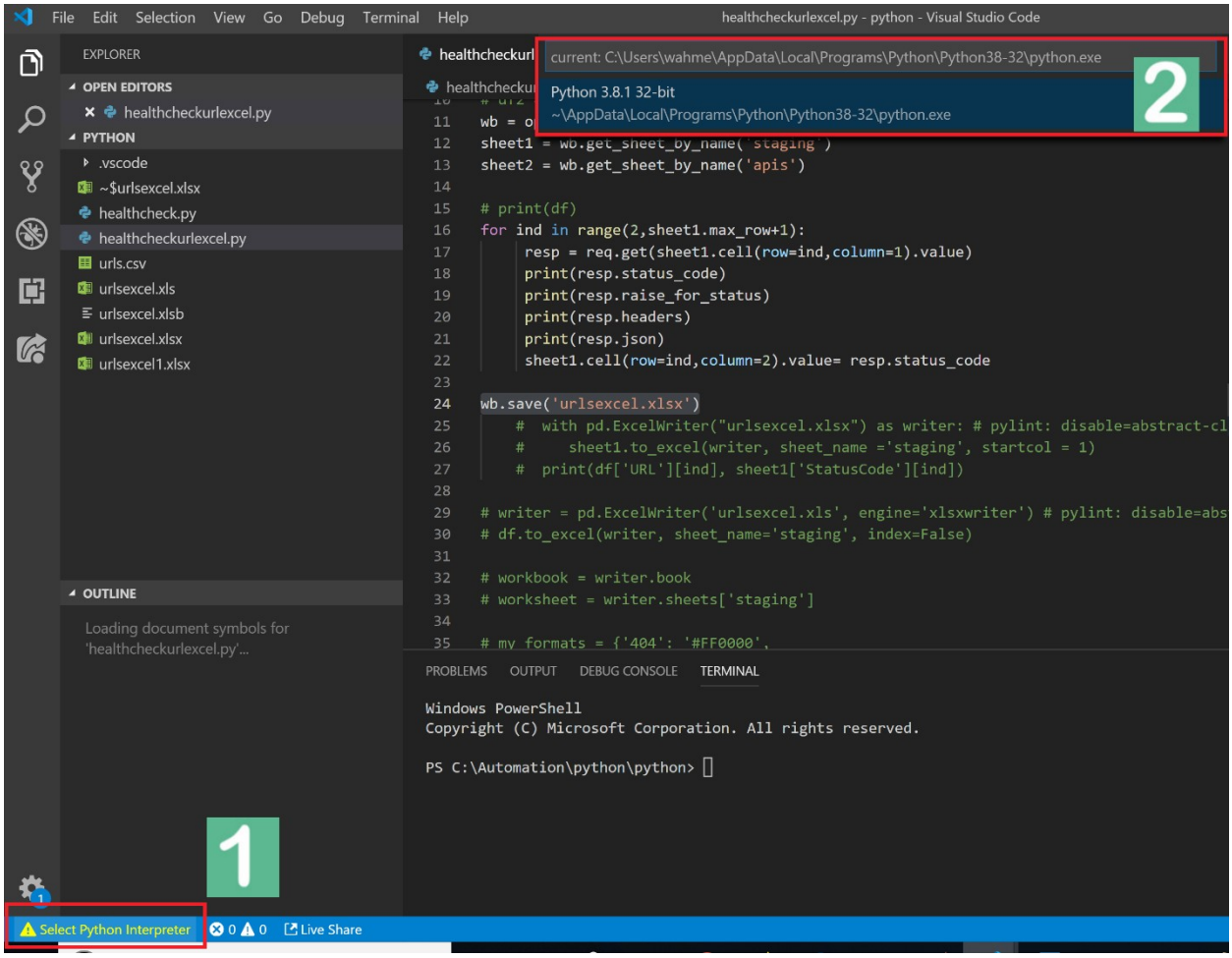


VS Code Configuration:

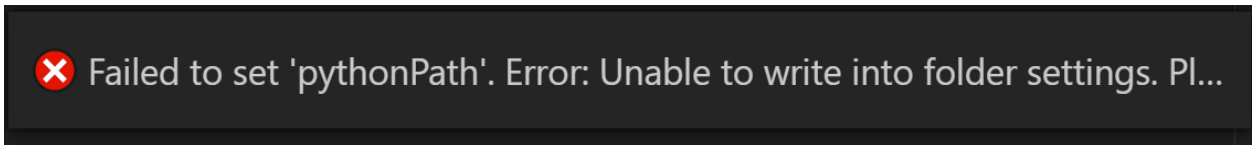
Now launch VS code IDE and open the python folder containing script. You will notice it will prompt you to set interpreter



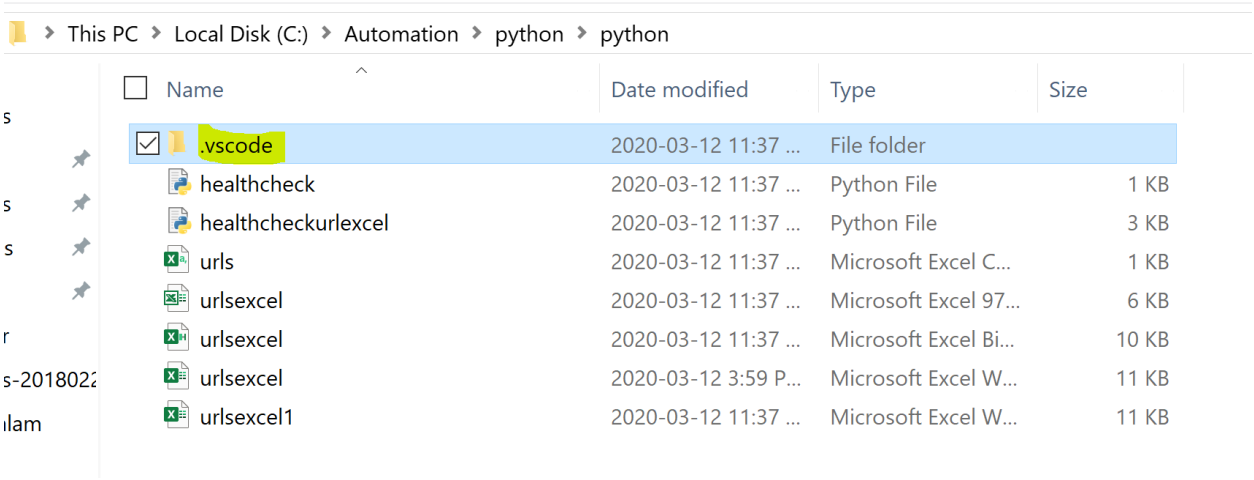
First click on it and you will see the prompt on top and select the path for python



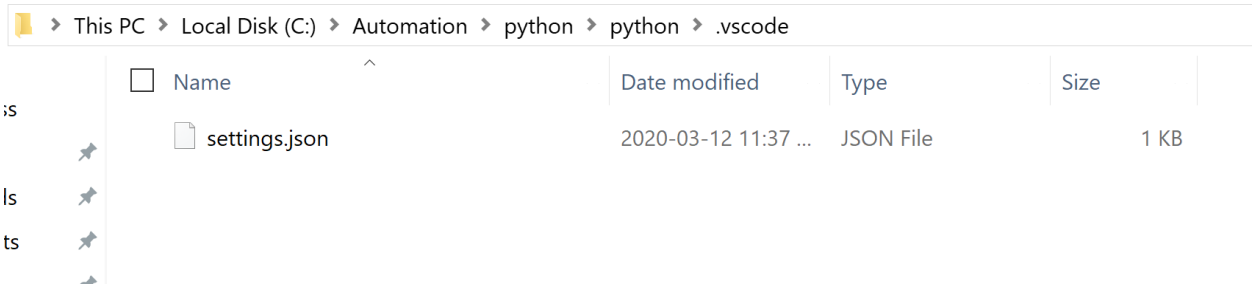
You will notice this error prompt



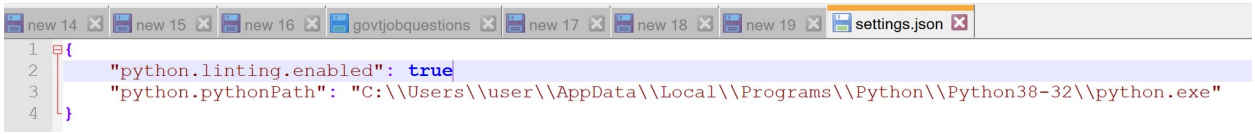
In order to fix this manually we will set the path in settings.json file in your project folder. Navigate to project folder in my case its here . You will see the .vscode folder , open it



You will see the settings.json file now open this in notepad++



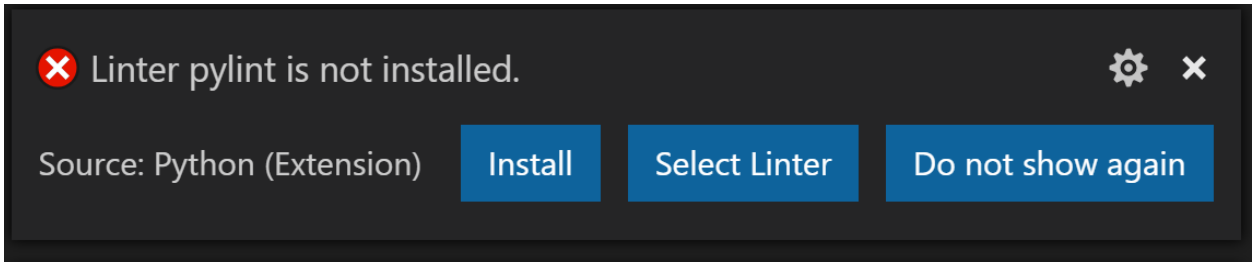
It will look like this



Just add the ‘ , ‘at the end of first line after true and ensure python.pythonPath points to where python application is residing.

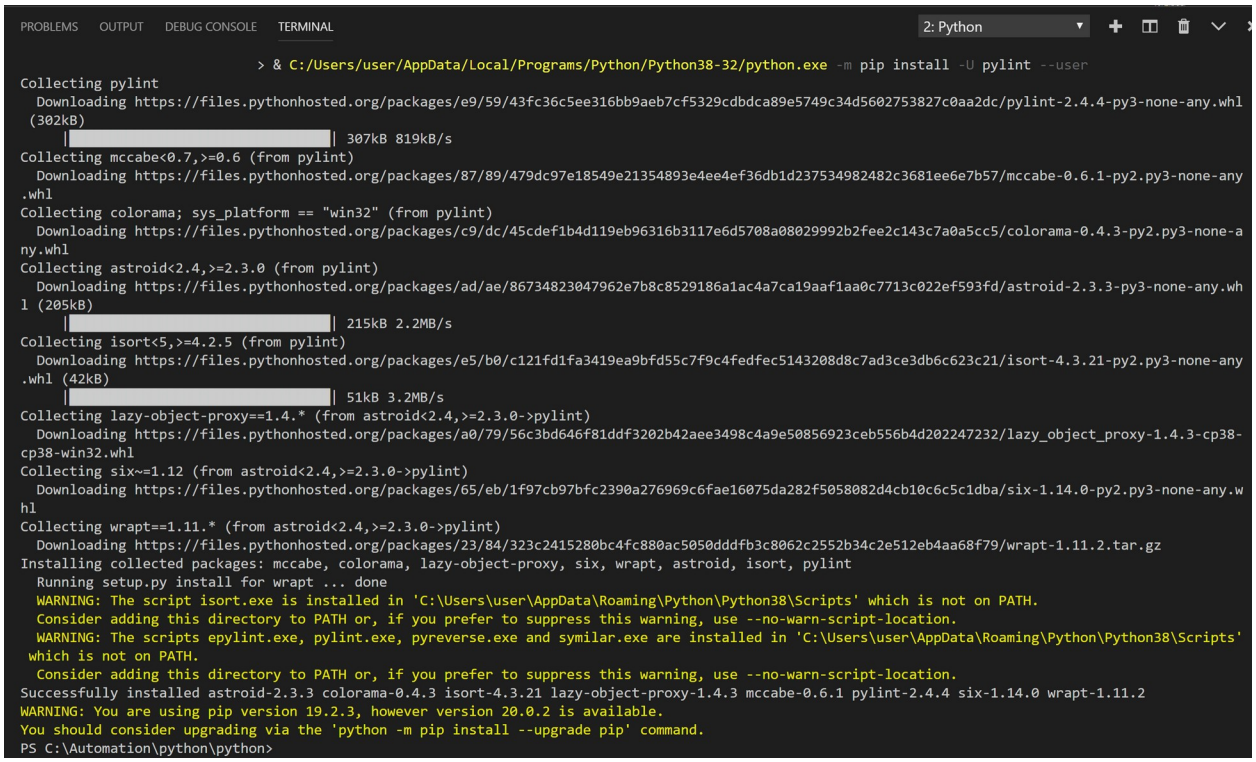
Save and close this file . Close the VScode and relaunch you might have to re-add the interpreter sometimes it takes time for VSCode to read path. Once its set you will notice in same place displaying correct version of python installed

Next you will see error prompt for pylint requesting to install Click on install



Pylint is a tool that checks for errors in Python code, tries to enforce a coding standard and looks for code smells. It can also look for certain type errors, it can recommend suggestions about how particular blocks can be refactored and can offer you details about the code's complexity.

You will see it installing pylint

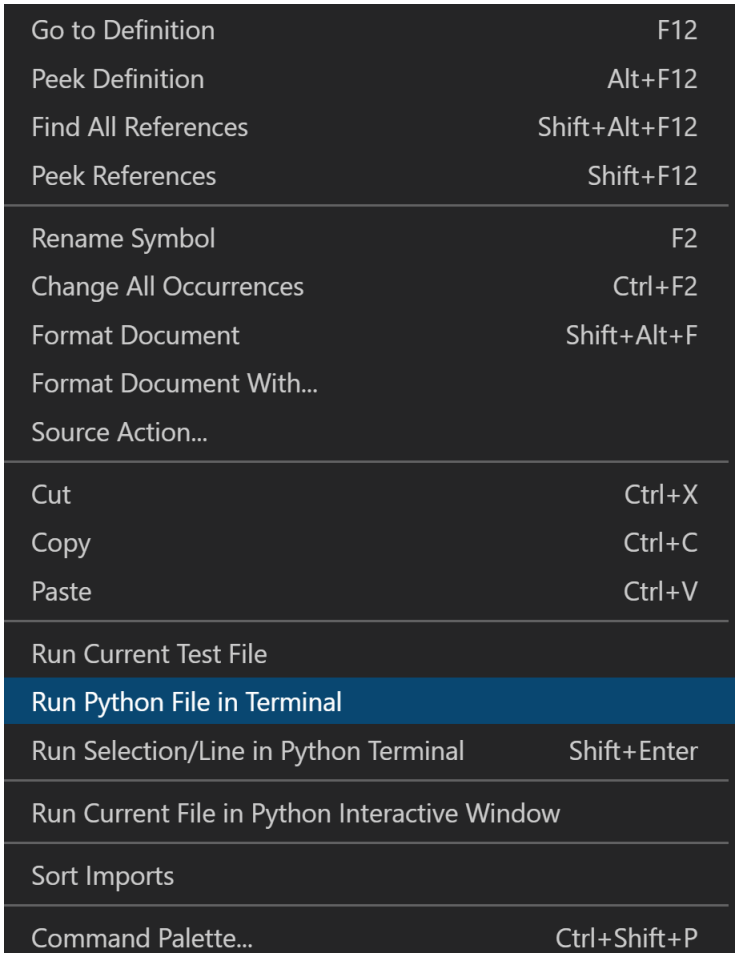


Now close VScode and re-laucnh it .

Pre-requisite Python Modules Installation:

4. Now install following python libraries:

Lets try to run code right click in script area and select Run Python File in Terminal



You will notice in terminal stating we have imported it but not installed library pandas

If you look at code first thing import statements thus we will need to install them one by one .

On terminal type following command

pip install pandas

You will see once installed

```
PS C:\Automation\python\python> pip install pandas
Collecting pandas
  Downloading https://files.pythonhosted.org/packages/d9/02/efd55383399646d0bc3bf0078130ae08f2890dd68276e3f4d7a4e94539a4/pandas-1.0.1-cp38-cp38-win32.
whl (7.8MB)
     |████████████████████████████████| 7.8MB 6.4MB/s
Collecting numpy>=1.13.3 (from pandas)
  Downloading https://files.pythonhosted.org/packages/0e/c3/be53614c4e3490778050e1df48fd463837297d5dd402dae3b500f2050eba/numpy-1.18.1-cp38-cp38-win32.
whl (10.8MB)
     |████████████████████████████████| 10.8MB 3.3MB/s
Collecting python-dateutil>=2.6.1 (from pandas)
  Downloading https://files.pythonhosted.org/packages/d4/70/d60450c3dd48ef87586924207ae8907090de0b306af2bce5d134d78615cb/python_dateutil-2.8.1-py2.py3
-none-any.whl (227kB)
     |████████████████████████████████| 235kB ...
Collecting pytz>=2017.2 (from pandas)
  Downloading https://files.pythonhosted.org/packages/e7/f9/f0b53f88060247251bf481fa6ea62cd0d25bf1b11a87888e53ce5b7c8ad2/pytz-2019.3-py2.py3-none-any.
whl (509kB)
     |████████████████████████████████| 512kB 6.4MB/s
Requirement already satisfied: six>=1.5 in c:\users\user\appdata\roaming\python\python38\site-packages (from python-dateutil>=2.6.1->pandas) (1.14.0)
Installing collected packages: numpy, python-dateutil, pytz, pandas
Successfully installed numpy-1.18.1 pandas-1.0.1 python-dateutil-2.8.1 pytz-2019.3
WARNING: You are using pip version 19.2.3, however version 20.0.2 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
PS C:\Automation\python\python>
```

Now we will install request library/module

pip install request

You will see once installed

```
PS C:\Automation\python\python> pip install requests
Collecting requests
  Downloading https://files.pythonhosted.org/packages/1a/70/1935c770cb3be6e3a8b78ced23d7e0f3b187f5cbfab4749523ed65d7c9b1/requests-2.23.0-py2.py3-none-
any.whl (58kB)
     |████████████████████████████████| 61kB 1.3MB/s
Collecting certifi>=2017.4.17 (from requests)
  Downloading https://files.pythonhosted.org/packages/b9/63/df50cac98ea0d5b006c55a399c3bf1db9da7b5a24de7890bc9cfd5dd9e99/certifi-2019.11.28-py2.py3-no
ne-any.whl (156kB)
     |████████████████████████████████| 163kB 3.2MB/s
Collecting urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 (from requests)
  Downloading https://files.pythonhosted.org/packages/e8/74/6e4f91745020f967d09332bb2b8b9b10090957334692eb88ea4afe91b77f/urllib3-1.25.8-py2.py3-none-a
ny.whl (125kB)
     |████████████████████████████████| 133kB ...
Collecting idna<3,>=2.5 (from requests)
  Downloading https://files.pythonhosted.org/packages/89/e3/afebe61c546d18fb1709a61bee788254b40e736cff7271c7de5de2dc4128/idna-2.9-py2.py3-none-any.whl
 (58kB)
     |████████████████████████████████| 61kB 4.1MB/s
Collecting chardet<4,>=3.0.2 (from requests)
  Downloading https://files.pythonhosted.org/packages/bc/a9/01ffebfb562e4274b6487b4bb1ddec7ca55ec7510b22e4c51f14098443b8/chardet-3.0.4-py2.py3-none-an
y.whl (133kB)
     |████████████████████████████████| 143kB 3.2MB/s
Installing collected packages: certifi, urllib3, idna, chardet, requests
Successfully installed certifi-2019.11.28 chardet-3.0.4 idna-2.9 requests-2.23.0 urllib3-1.25.8
WARNING: You are using pip version 19.2.3, however version 20.0.2 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
PS C:\Automation\python\python>
```

Now we will install xlsxwriter

pip install xlsxwriter

You will see once installed

```
PS C:\Automation\python\python> pip install xlsxwriter
Collecting xlsxwriter
  Downloading https://files.pythonhosted.org/packages/00/1f/2092a81056d36c1b6651a645aa84c1f76bcee03103072d4fe1cb58501d69/XlsxWriter-1.2.8-py2.py3-none
-any.whl (141kB)
     |████████████████████████████████| 143kB 1.6MB/s
Installing collected packages: xlsxwriter
Successfully installed xlsxwriter-1.2.8
WARNING: You are using pip version 19.2.3, however version 20.0.2 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
PS C:\Automation\python\python>
```

Now we will install xlrd module

pip install xlrd

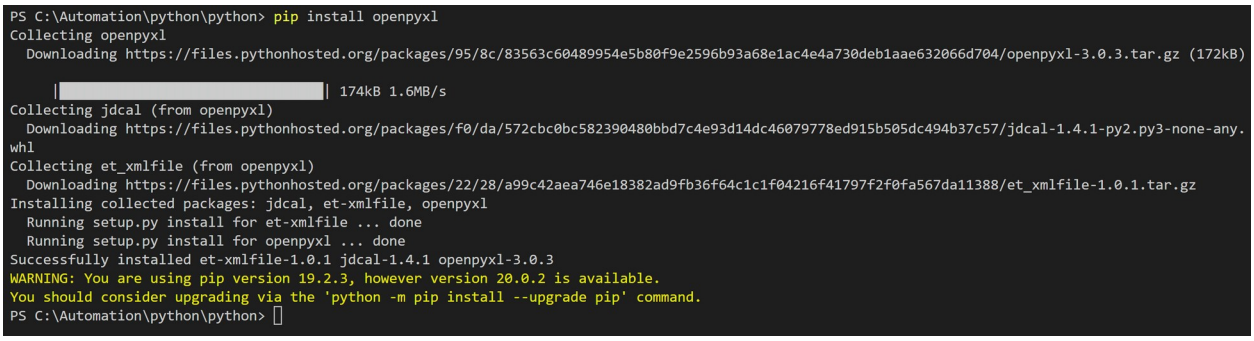
You will see once installed

```
PS C:\Automation\python\python> pip install xlrd
Collecting xlrd
  Downloading https://files.pythonhosted.org/packages/b0/16/63576a1a001752e34bf8ea62e367997530dc553b689356b9879339cf45a4/xlrd-1.2.0-py2.py3-none-any.w
hl (103kB)
     |████████████████████████████████| 112kB 2.2MB/s
Installing collected packages: xlrd
Successfully installed xlrd-1.2.0
WARNING: You are using pip version 19.2.3, however version 20.0.2 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
PS C:\Automation\python\python>
```

Now we will install openpyxl module

pip install openpyxl

You will see once installed



Code Walkthrough:

Now lets examine the code

```
import pandas as pd
import requests as req
import xlsxwriter
import xlrd
import openpyxl
```

When I started learning how using python we can read and write in excel I came across various python libraries for example panadas and openpyxl etc. In this code we will focus on python library openpyxl and requests.

Openpyxl: is a Python library to read/write Excel 2010 xlsx/xlsm/xltx/xltm files.

Requests: The requests library is the de facto standard for making HTTP requests in Python. It abstracts the complexities of making requests behind a beautiful, simple API so that you can focus on interacting with services and consuming data in your application.

Let's move into code

```
wb = openpyxl.load_workbook('urlsexcel.xlsx')
sheet1 = wb.get_sheet_by_name('staging')
sheet2 = wb.get_sheet_by_name('apis')
```

Now in first line we are opening the excel sheet saves in xlsx format as workbook using load_workbook method of openpyxl library. Our excel has 2 sheets staging which holds web urls and apis which holds rest apis.

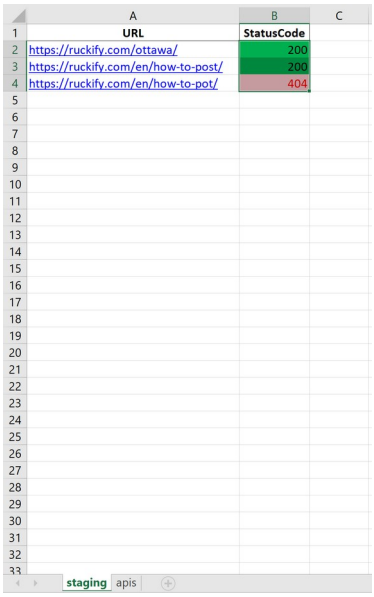
You can see using get_sheet_by_name method I am accessing the staging sheet and saving it in sheet1 and so is case with apis sheet saved in sheet2.

Let go further into code

```
for ind in range(2,sheet1.max_row+1):
     resp = req.get(sheet1.cell(row=ind,column=1).value)
     print(resp.status_code)
     print(resp.raise_for_status)
     print(resp.headers)
     print(resp.json)
     sheet1.cell(row=ind,column=2).value= resp.status_code

wb.save('urlsexcel.xlsx')
```

Using for loop and setting range where we want to start from and where to end, in range you can see we are starting from 2 means 2nd row as you can see from staging sheet below



	A	B	C
1	URL	StatusCode	
2	https://ruckify.com/ottawa/	200	
3	https://ruckify.com/en/how-to-post/	200	
4	https://ruckify.com/en/how-to-pot/	404	

staging apis

Now we have to let for loop know where to end thus using max_row will return number of rows which in this case is 4 but range is exclusive for example if we have range (2,4) it will iterate through row 2 and 3 not 4 as it exclude thus we add +1 and range becomes (2,5). Here is syntax of range

range (start, stop[, step) . Start are Step are optional arguments. In our example step is not specified by default its 1 means increment by 1.

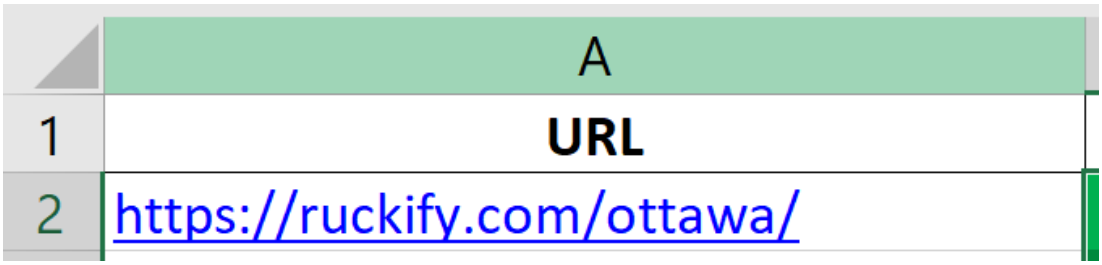
Now in next line we have

```
resp = req.get(sheet1.cell(row=ind,column=1).value)
```

If the module name is followed by ‘as’ then the name following as is bound directly to imported module, in our case its req is bounded to requests its just like using requests directly for example we didn’t bound openpyxl thus we used openpyxl.load_workbook .

Thus, we used req.get method to send https request to URL, now in order to access the first URL in sheet we have set

row=ind=2(start in range) and column =1



	A
1	URL
2	https://ruckify.com/ottawa/

Using cell method we can get value of cell (2,1) basically it will return https://ruckify.com/ottawa/

Thus once request is sent to the URL it return entire response and saved in resp variable.

In following lines you can see printed various things from response,

This will output status code

```
print(resp.status_code)
```

then this will output

```
print(resp.raise_for_status)
```

raises stored HTTPError, if one occurred.

For example :

```
import requests
url = "http://mock.kite.com/status/404"
r = requests.get(url)
try:
    r.raise_for_status()
except requests.exceptions.HTTPError as e:
    print e
```

Output:

404 Client Error: NOT FOUND

Next this will output headers

```
print(resp.headers)
```

Next line is where we save the response status code into excel sheet.

```
sheet1.cell(row=ind,column=2).value= resp.status_code
```

Now we need to save the response in 2nd row and 2nd column

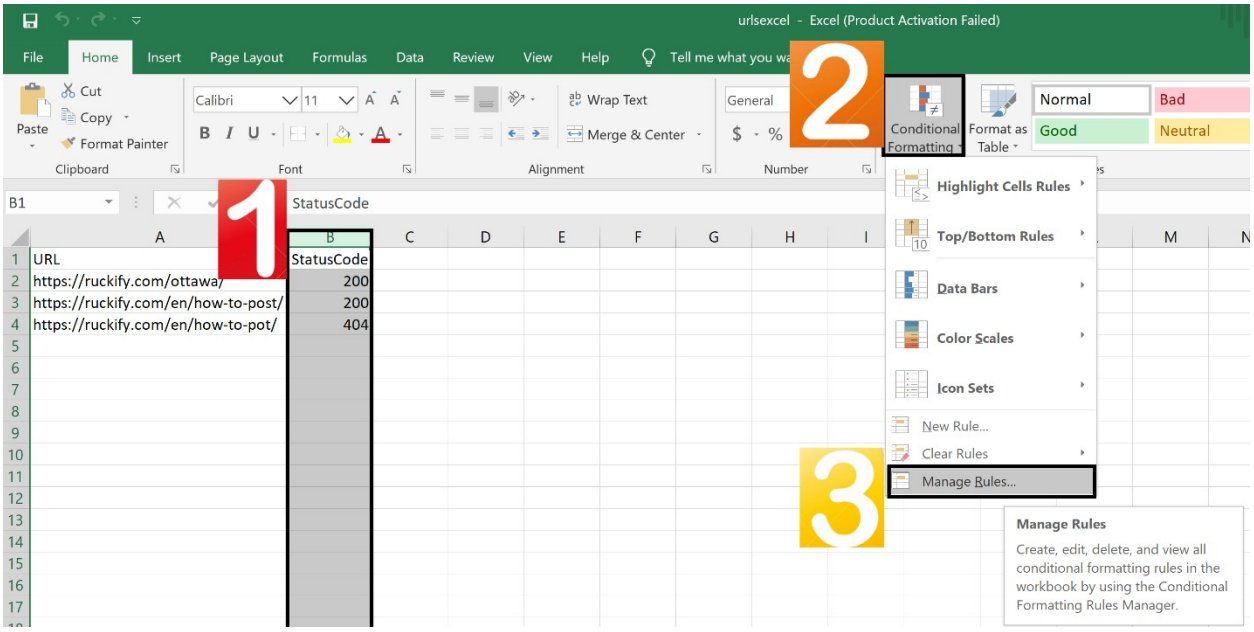
	A	B
1	URL	StatusCode
2	https://ruckify.com/ottawa/	200

Thus the for loop will continue for rest of the URL's in the sheet. Once done we will save the workbook

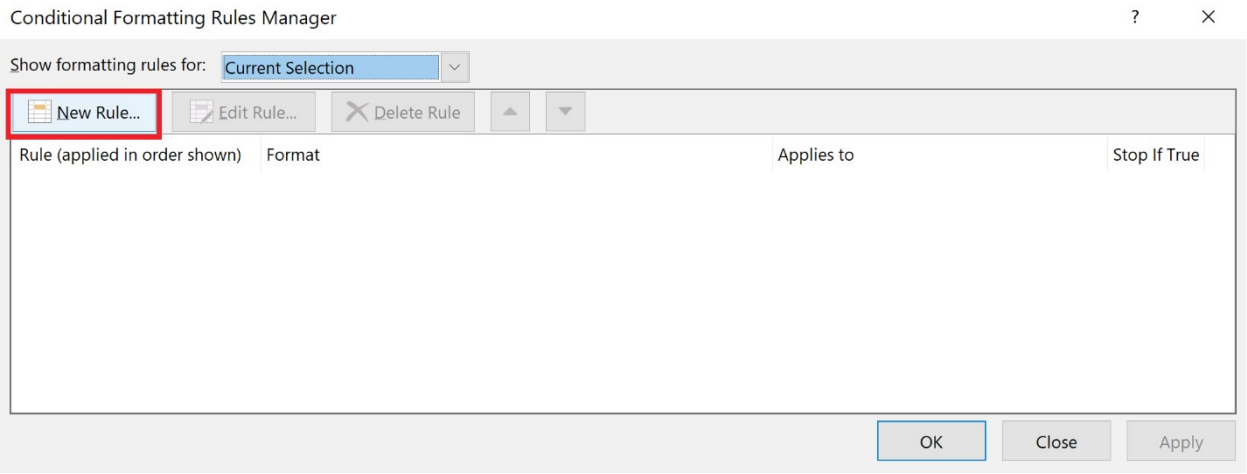
```
wb.save('urlsexcel.xlsx')
```

Excel Cell Formatting:

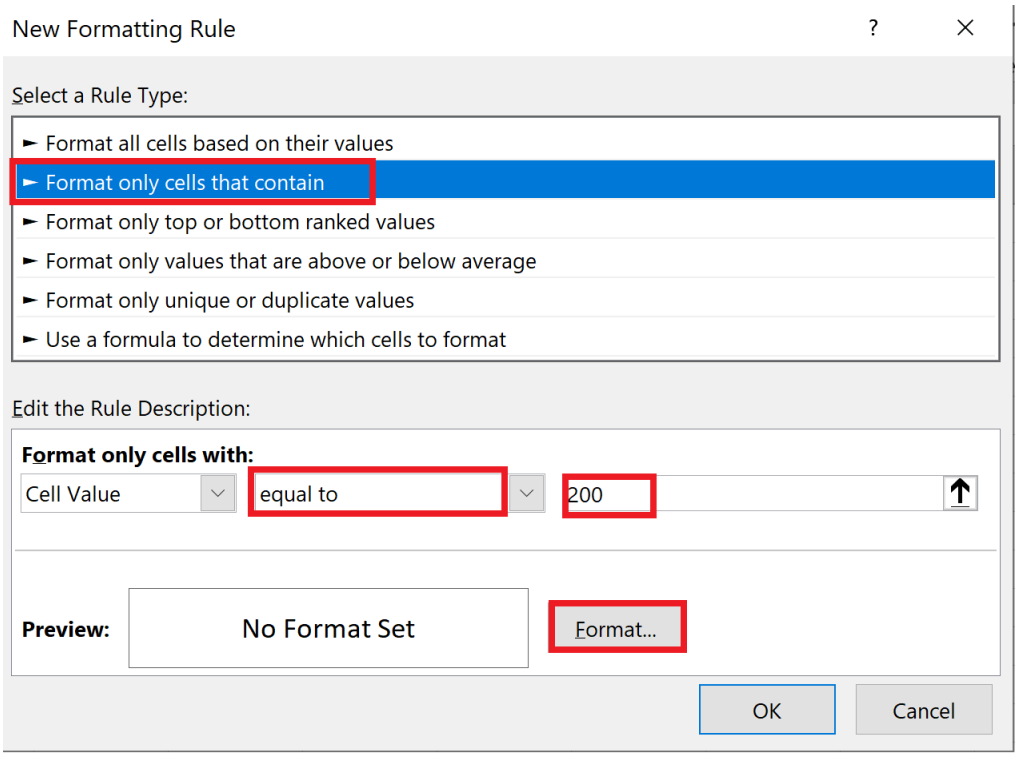
Select the column B where StatusCode is and select Conditional Formatting and Click on Manage Rules



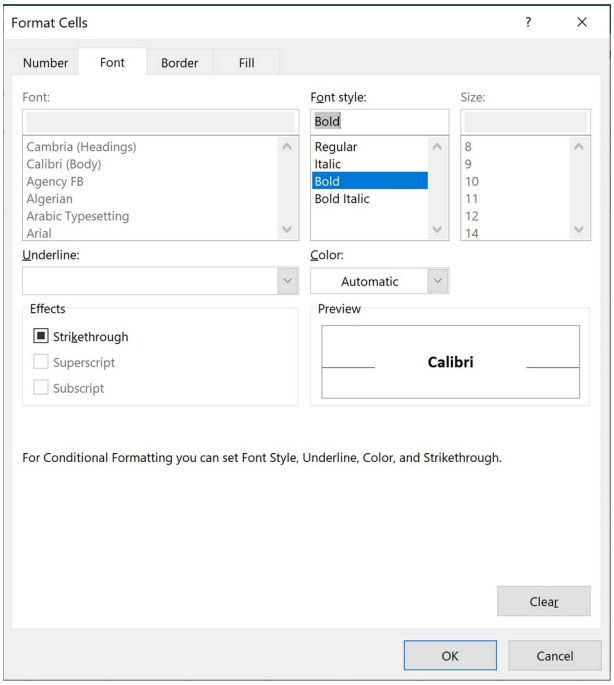
It will launch new pop-up. Click on New Rule



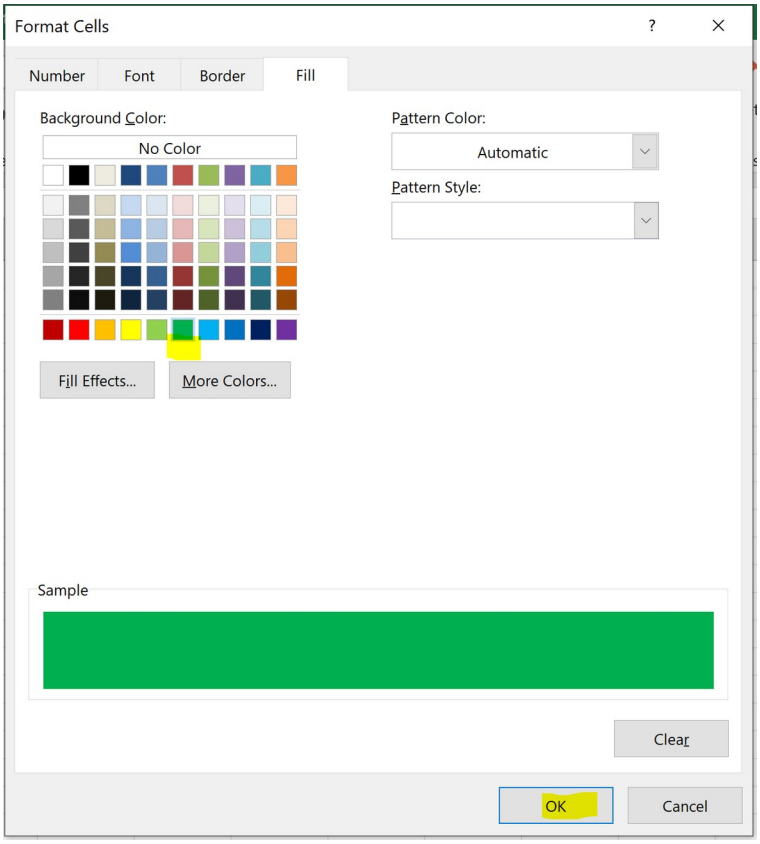
Now select “Format only cells that contain” option. Then from drop down menu select equal to and set 200 in field . Then click on Format button



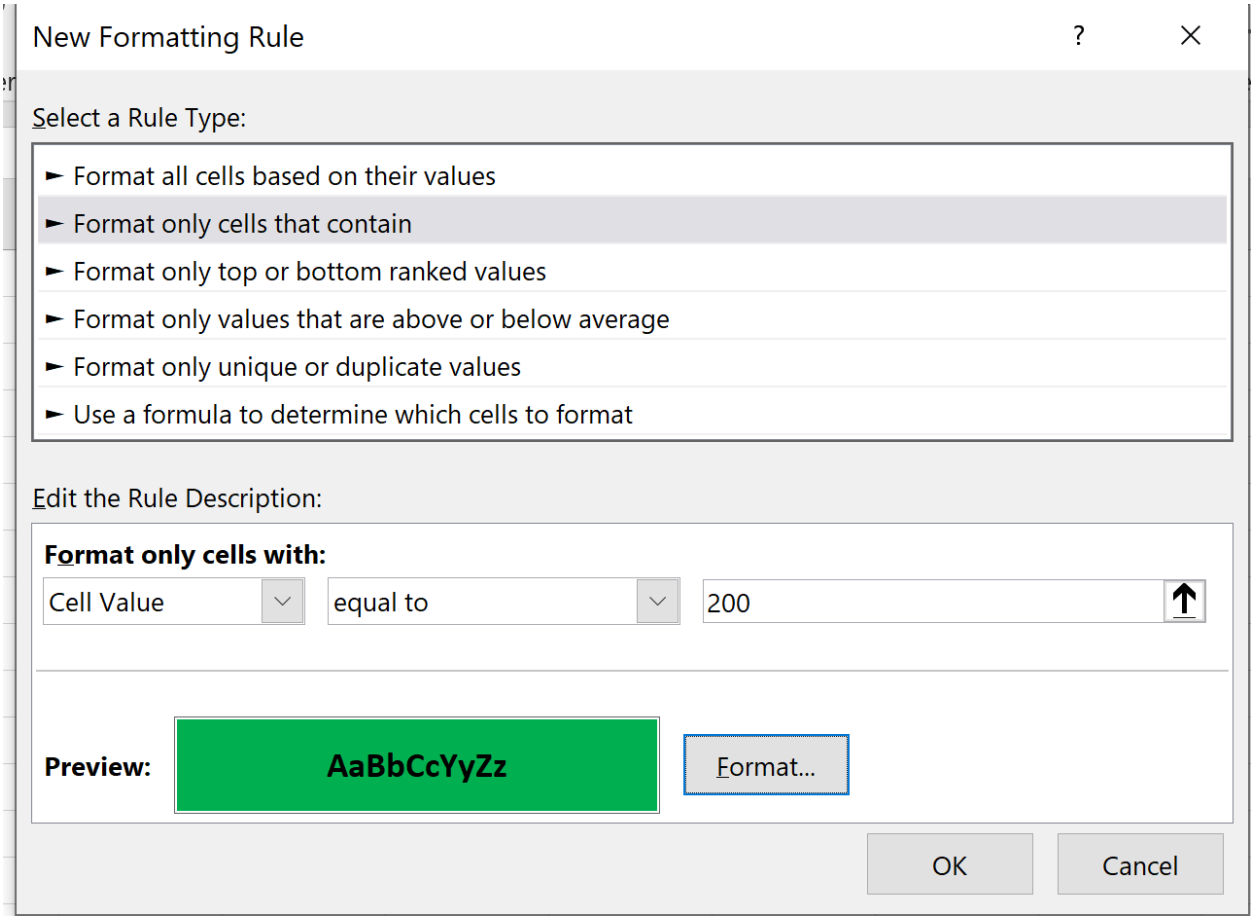
In Format Cell window under Font tab I setted it to be Bold . Then Click on Fill tab



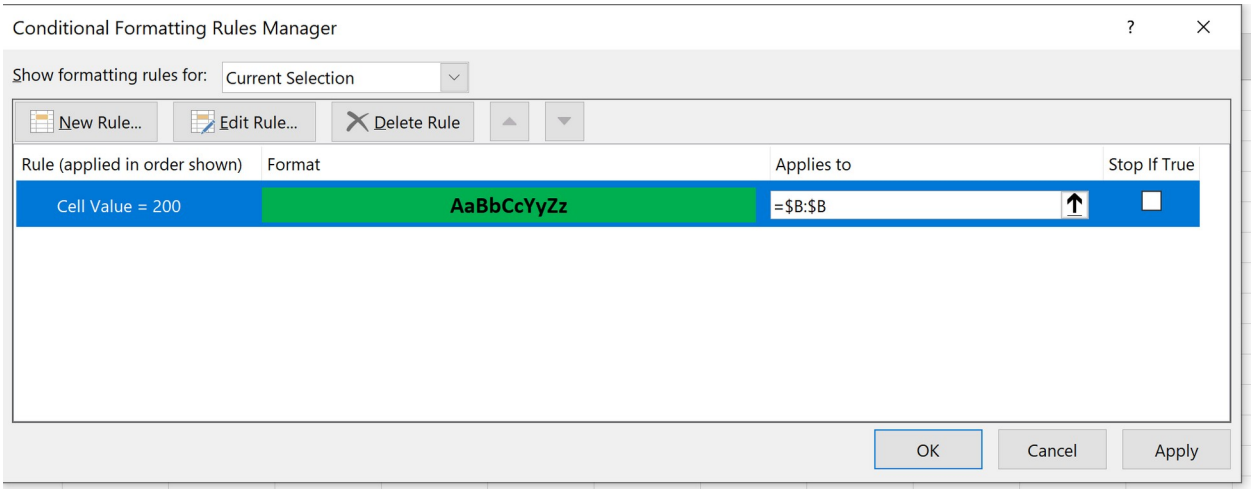
In Fill tab select Green color and click ok



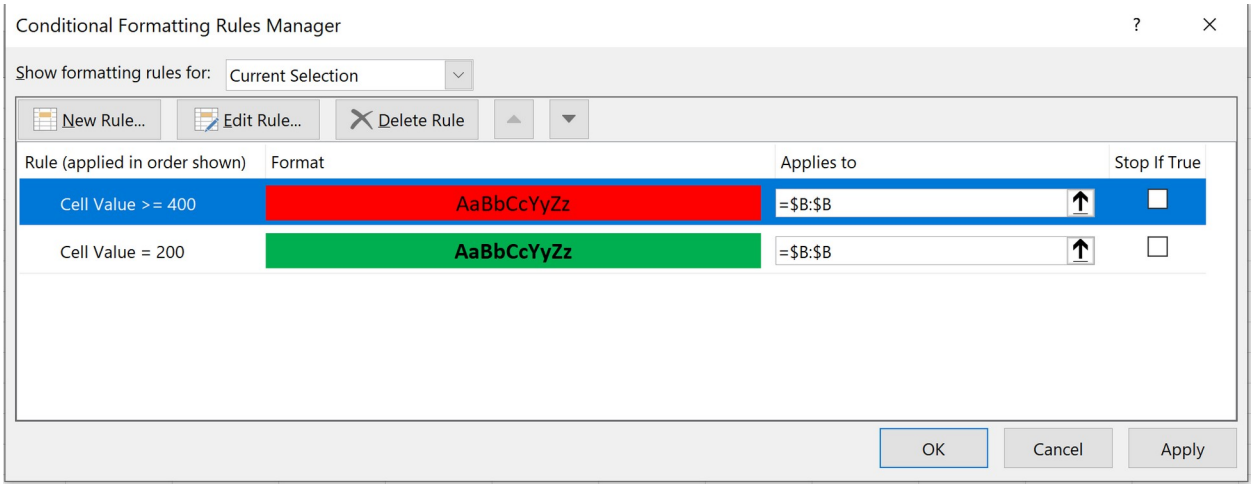
You will be back to New Formatting Rule. The rule with set is any cell in column B (StausCode) if equals to 200 , bold the font and fill the cell by Green color.



Click Ok and you weill see the full rule set



Similarliy set rule for 4xx error instead of equal I have set it to greater than or equal and value as 400. Formatted bold for for font and fill the cell with red color.



Now click Apply

Now Save and Close the excel sheet and run the code again.

	A	B	C
1	URL	StatusCode	
2	https://ruckify.com/ottawa/	200	
3	https://ruckify.com/en/how-to-post/	200	
4	https://ruckify.com/en/how-to-pot/	404	
5			