Python Training

Workstation Setup Guide

DataBank IMX

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DataBank
A KYOCERA GROUP COMPANY

Setting Up Your Workstation for Python Development

Performing Python development requires a few components to be installed on your workstation. You can, of course, install whatever IDE you prefer, but I will be teaching the class using Visual Studio Code (the most popular IDE for Python development) and other convenience tools that you may find useful. If you want to set up your development environment similar to mine, the instructions below will walk you through the setup process. If you're following these steps, it is best to do them in the order presented.

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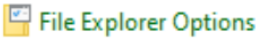
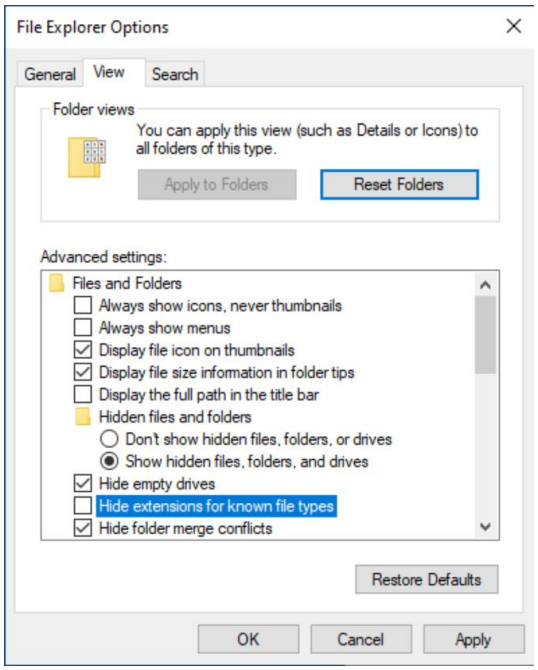
Configure Windows 10 to Show File Extensions

When doing development, the convenience feature in Windows that hides the extensions for known file types is an impediment to the process, so let's turn that off.

1. Launch the Control Panel and go into the settings for "File Explorer Options."

2. On the "View" tab, un-check the box labeled "Hide extensions for known file types"
   Then click [OK]

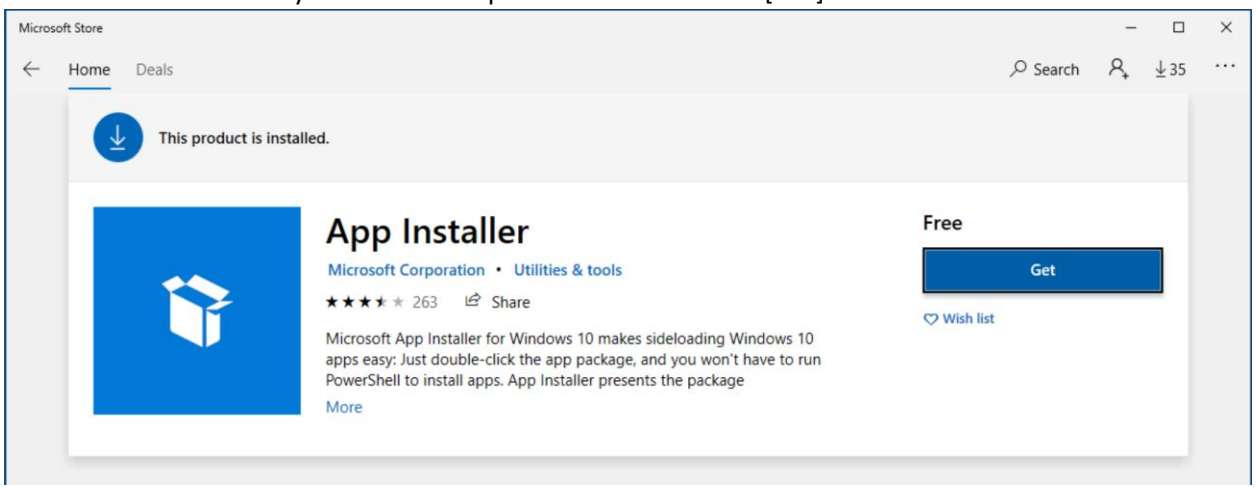
   

Install Winget (App Installer)

Many of the components we will use are best installed from the terminal using the command-line installer **winget**. Follow the steps below to

1. Open the Microsoft Store and search for “App Installer”

2. Select the one created by “Microsoft Corporation” and click the [Get] button

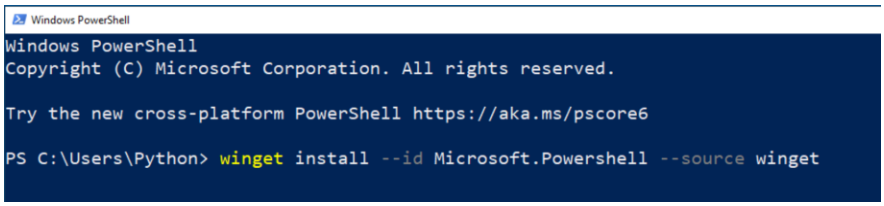


3. The application will install automatically

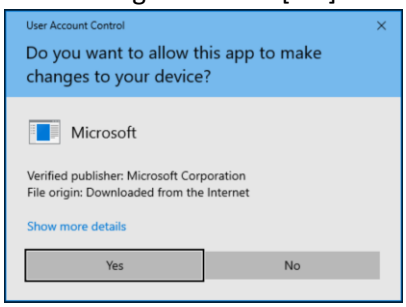
Install PowerShell 7

Although the built-in Windows PowerShell is sufficient for most activities, the newer, open-source PowerShell 7 is significantly more customizable and provides more robust functionality when used in both Windows Terminal and Visual Studio Code.

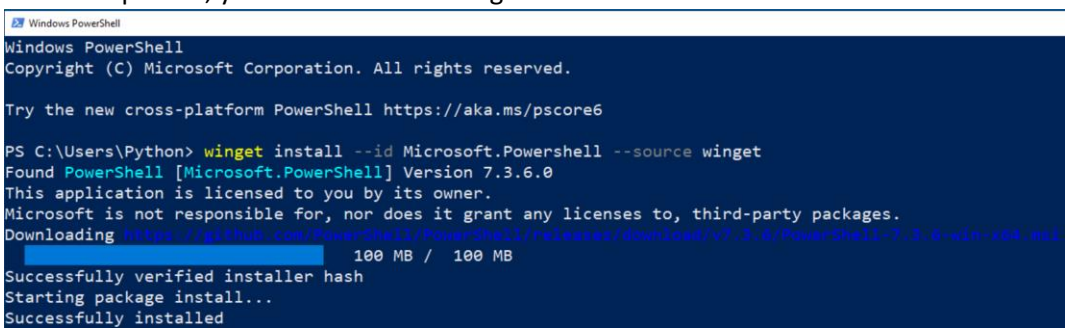
1. Launch Windows PowerShell and enter the following command:
   `winget install -e --id Microsoft.PowerShell`



2. The installation will begin automatically. During the install, UAC will prompt you to allow the app to make changes. Choose [Yes]

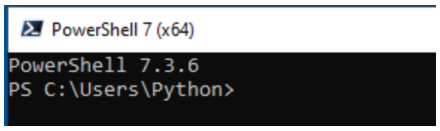


3. After completion, you will see this message



4. Close Windows PowerShell

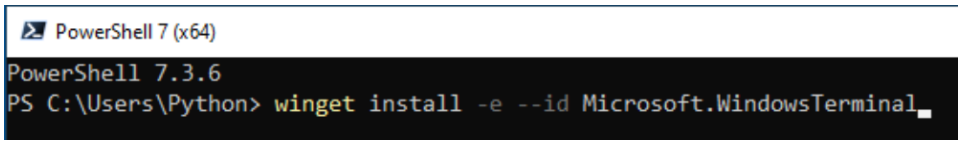
5. Run `pwsh` to verify that you can now launch PowerShell 7



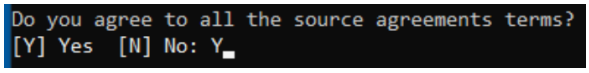
Install Windows Terminal

The Windows Terminal application allows you to have multiple terminal tabs open simultaneously and to control which of the command-line applications is in use at any time.

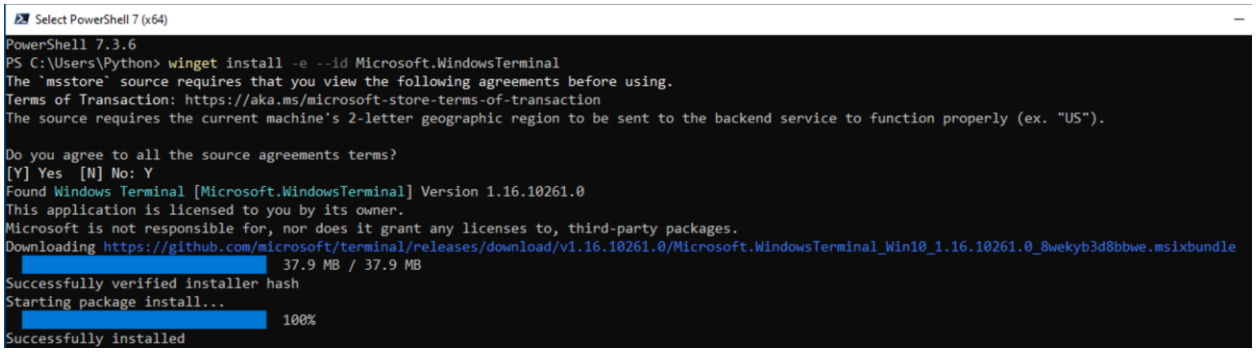
1. Open PowerShell 7 and enter the following command
   `winget install -e --id Microsoft.WindowsTerminal`



2. Agree to the terms

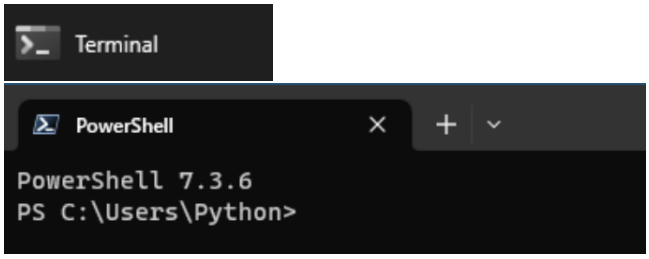


3. The installation will complete automatically



4. Close PowerShell 7

5. Run `wt` to verify that you can open Windows Terminal



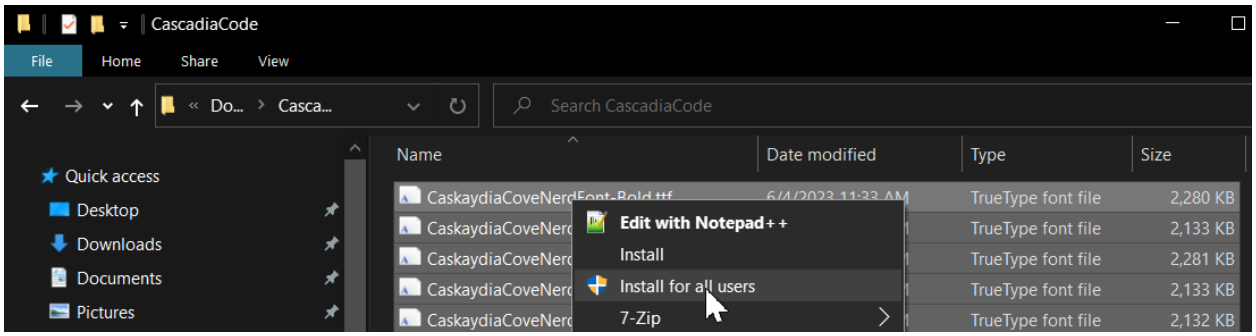
Install the CaskaydiaCove Nerd Font

We will be customizing our terminal to show additional information that will require glyph characters not included in most standard fonts. In order to support this, we'll be installing a so-called "nerd font" that includes these extra glyphs. The one I prefer is called CaskaydiaCove, which is a nerd-font port of Microsoft's Cascadia Code font. There are many different distributions of this font, and some don't include all of the glyphs, so I recommend obtaining the one distributed on the Nerd Fonts website (below).

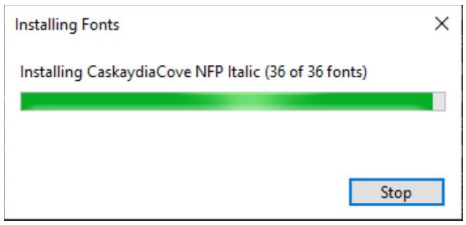
1. Launch a browser and navigate to:
   http://www.nerdfonts.com/font-downloads

2. Find "CaskaydiaCove Nerd Font" and click on "Download"

3. Unzip and open the download file, select all of the fonts, right click, and select "Install for all users"



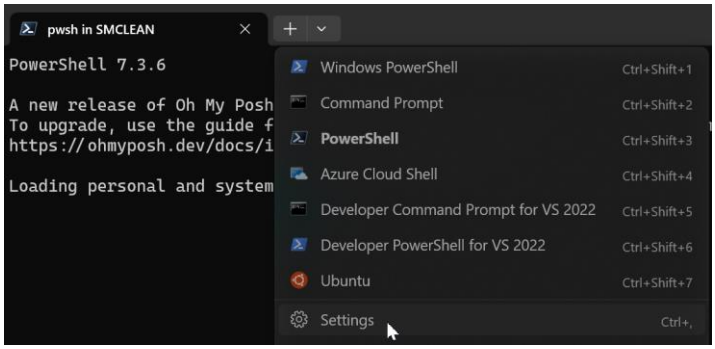
4. The fonts will install to Windows automatically



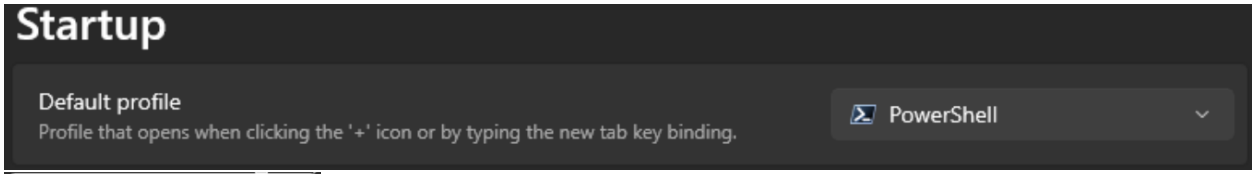
Customize the Windows Terminal

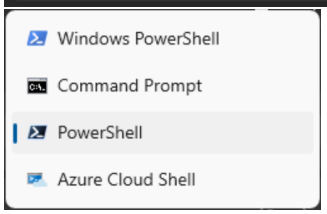
To ready the Windows Terminal for our later setup, we need to set up a few preliminary settings.
Note: You may have to reboot after installing your fonts before this step

1. Open the Windows Terminal and click on the drop-down arrow next to the tab [+] button. Select “Settings”

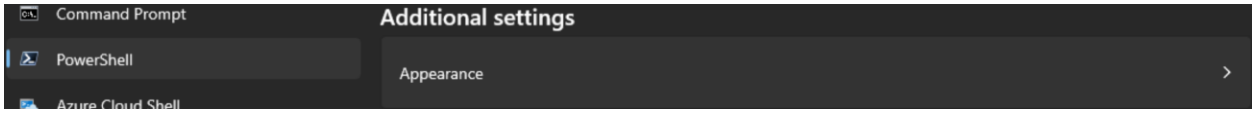


2. In the “Startup” section, set the “Default Profile” to “PowerShell”





3. Under “Profiles” select “PowerShell” then scroll down and click on “Appearance”



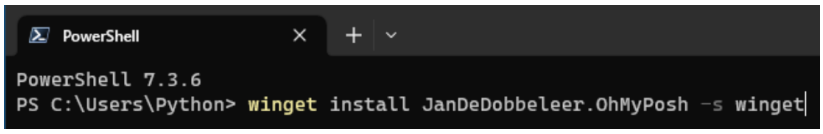
4. In the “Font Face” setting, assign “CaskaydiaCove Nerd Font

5. Click [Save]

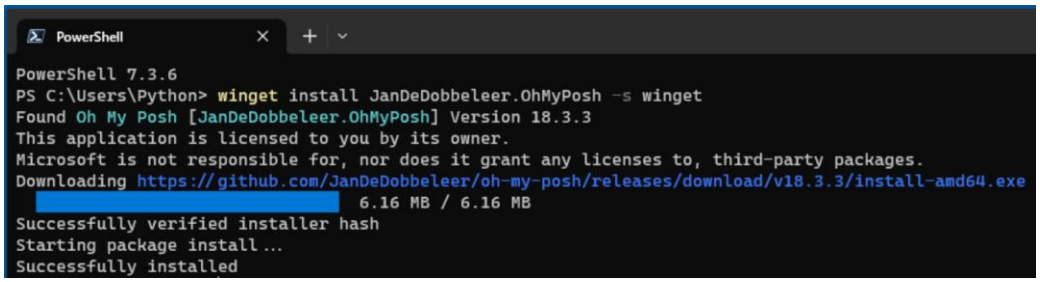
Set Up Oh-My-Posh

We often work in scenarios where it's useful to see additional information (like execution time, source code repository state, etc. in the terminal. We can set up PowerShell 7 in Windows Terminal to provide a much more meaningful prompt using a utility called "Oh My Posh"

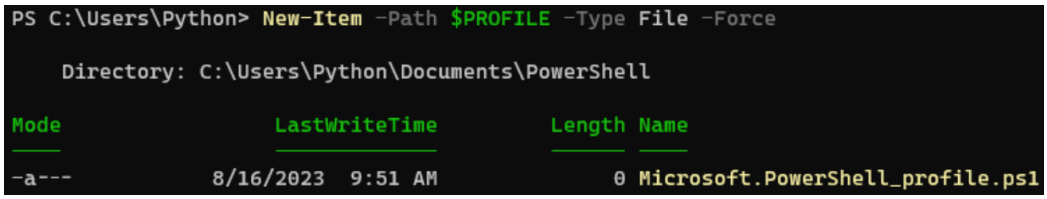
1. Open Windows Terminal and in your PowerShell 7 tab, enter the following command
   `winget install -e -id JanDeDobbeleer.OhMyPosh`



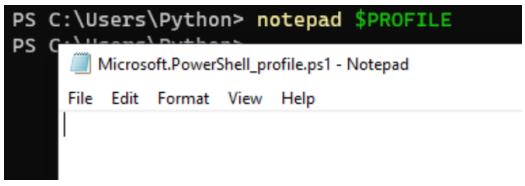
2. A successful install will look like this



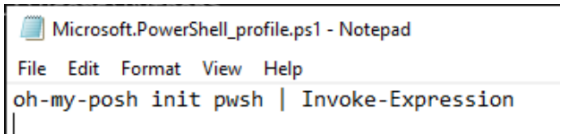
3. In the terminal, enter the following line to create a setup file for your PowerShell profile
   `New-Item -Path $PROFILE -Type File -Force`



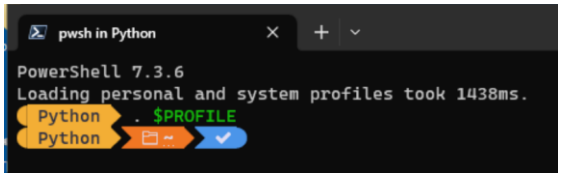
4. In the terminal, enter the following command to open the file in notepad
   `notepad $PROFILE`



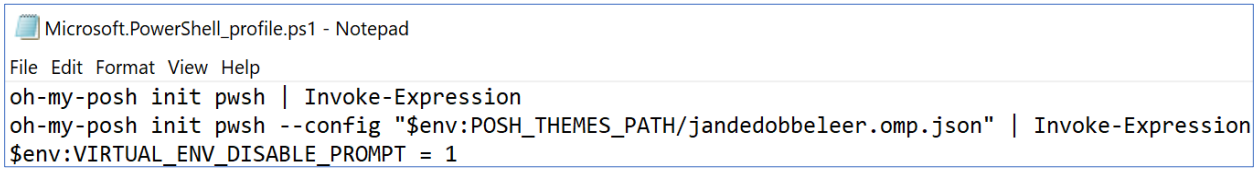
5. In the Notepad file, add the following line and save the file
   `oh-my-posh init pwsh | Invoke-Expression`



6. In the terminal, enter the following command to reload the profile
   `. $PROFILE`
   Note: You may need to close and reopen the terminal window or reboot to load the profile path.

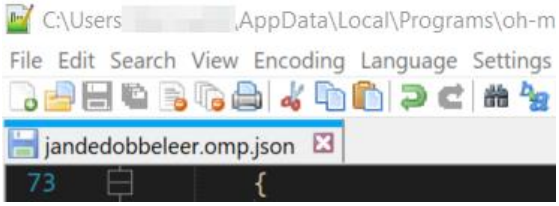
7. You should now see a prompt like this in the terminal indicating that you've configured Oh My Posh
   

   Note: If you don't see the folder glyph, make sure you installed and configured your nerd font

8. You can configure literally thousands of options for what information the terminal prompt will show, but for purposes of the Python training class, I will use Jan DeDobbeleer's default. To implement this, add the following line to the profile setup in Notepad and save.
   ```
   oh-my-posh init pwsh --config
   "$env:POSH_THEMES_PATH/jandedobbeleer.omp.json" | Invoke-Expression
   $env:VIRTUAL_ENV_DISABLE_PROMPT = 1
   ```
   

9. In the terminal, enter the following command to reload the profile
   `. $PROFILE`

10. We are going to edit the theme in order to prevent the prompt from line-wrapping after updating to Oh-My-Posh v 18.9.1 or higher. [See this GitHub issue] for the developer's explanation.

11. Edit the JSON file (path below) for the theme in any test editor (I used Notepad++):
    `C:\Users\USERNAME\AppData\Local\Programs\oh-my-posh\themes\jandedobbeleer.omp.json`
    

12. Find the python section.
    From CTRL-F, search for `\ue235`, the Python powerline glyph
    

13. Edit these values and re-save the file:

```
"fetch_virtual_env": true
```

```
...
```

```
"template": " \ue235 {{ if .Error }}{{ .Error }}{{ else if .Venv
}}({{ .Venv }}) {{ .Full }}{{ else }}{{ .Full }}{{ end }} ",
```

```
{
  "background": "#FFDE57",
  "foreground": "#111111",
  "powerline_symbol": "\ue0b0",
  "properties": {
    "display_mode": "files",
    "fetch_virtual_env": true
  },
  "style": "powerline",
  "template": " \ue235 {{ if .Error }}{{ .Error }}{{ else if .Venv }}({{ .Venv }}) {{ .Full }}{{ else }}{{ .Full }}{{ end }} ",
  "type": "python"
},
```

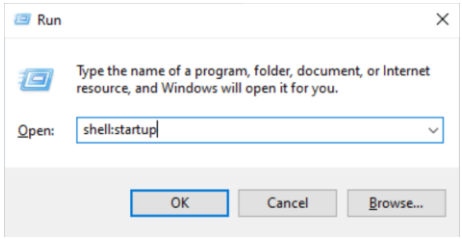
14. You should now see something like this

This is how we want our prompt to appear in Visual Studio Code, so we're done setting up the terminal

Set Up Quake Mode Terminal (optional)

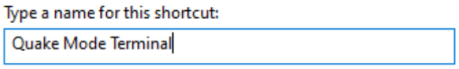
I like to have the terminal available at all times. There is a special command to launch the Windows terminal in so-called "Quake-Mode." When in this mode, the terminal is at the top of the main monitor screen and can be hidden or shown using the keyboard shortcut Window+back-tick [⊞]+[`]

1. Click the start button and type "run" to open a run command.
   In the run box, enter the following command and click [OK]
   `shell:startup`

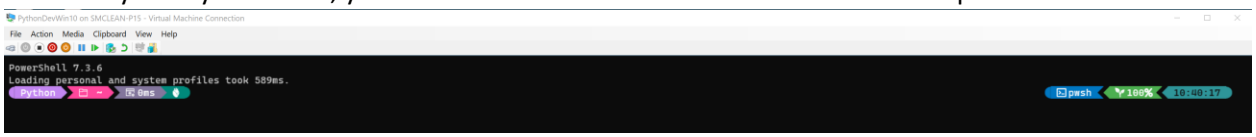


2. In the window that pops up, right click and choose New > Shortcut. In the shortcut wizard, enter the following location and click [Next]
   `wt -w _quake`

3. Name the shortcut whatever you want and click [Finish]



4. Now every time you reboot, you'll have a hideable PowerShell terminal at the top of the screen

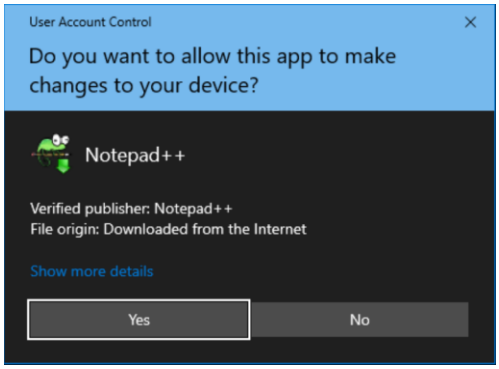


Install Notepad++ (optional)

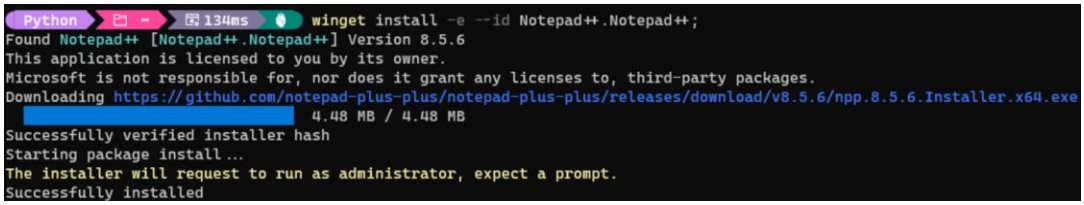
Even though we're using VS Code as our IDE, it's often useful to have a full-featured text editor as well. I like to use Notepad++ for this.

1. In the terminal, enter the following command
   `winget install -e --id Notepad++.Notepad++`

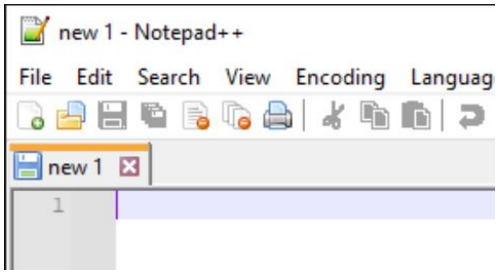
2. Respond "Yes" to the UAC warning



3. The installation will complete automatically



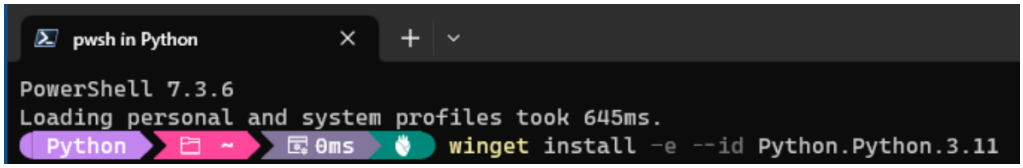
4. Verify that you can now launch Notepad++



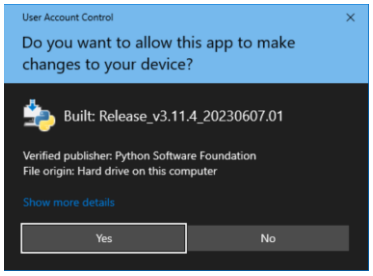
Install Python

Before we can write and execute Python, we need to install the Python interpreter itself. The current version of Python is v3.11. This is compatible with the code examples we'll use in the course.

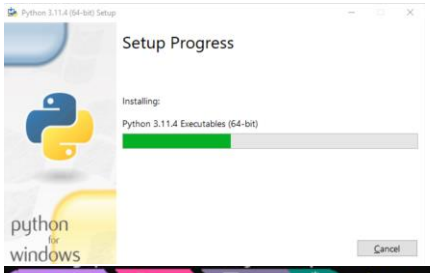
1. In the terminal, enter the following command
   `winget install -e --id Python.Python.3.11`

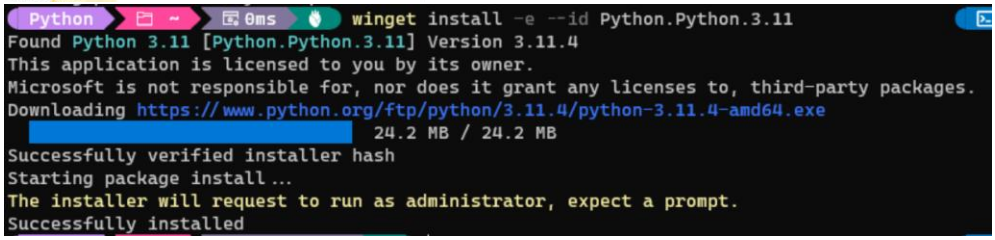


2. Agree to the app making changes

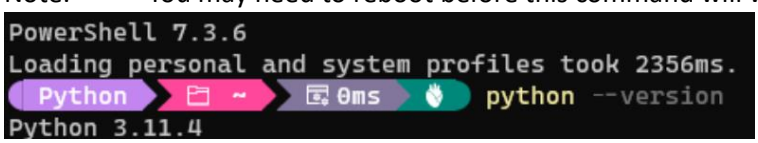


3. The installer will run and complete automatically





4. To verify that you have Python installed, enter the following in the terminal:
   `python --version`
   Note: You may need to reboot before this command will work

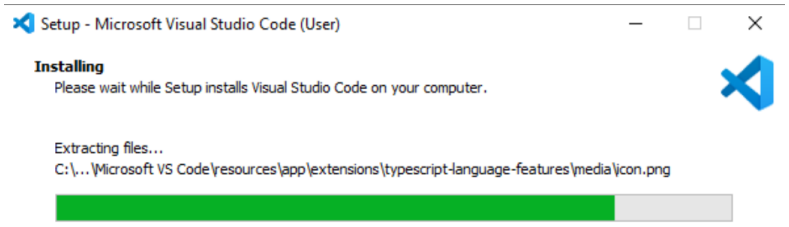


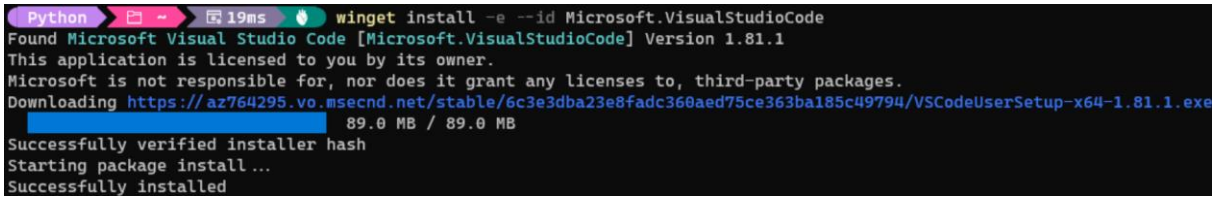
Install Visual Studio Code

Visual Studio Code is an open-source IDE that's useful for a wide variety of coding languages. I use it for Python, HTML, JavaScript, and CSS, even though I have Visual Studio Enterprise available for .NET development. The slick, easy, and highly customizable interface make VS code the most popular IDE for Python developers.

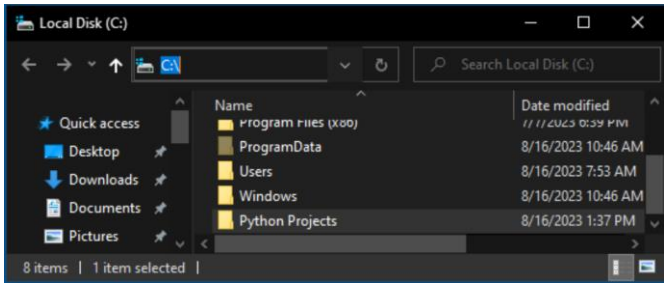
1. In the terminal, enter the following command
   `winget install -e --id Microsoft.VisualStudioCode`

2. The installation will start and complete automatically





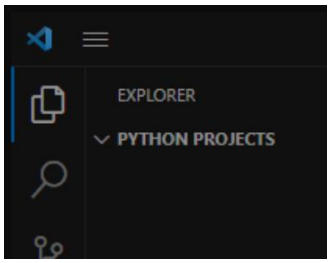
3. Create a folder called "Python Projects." I created mine on the C: root.



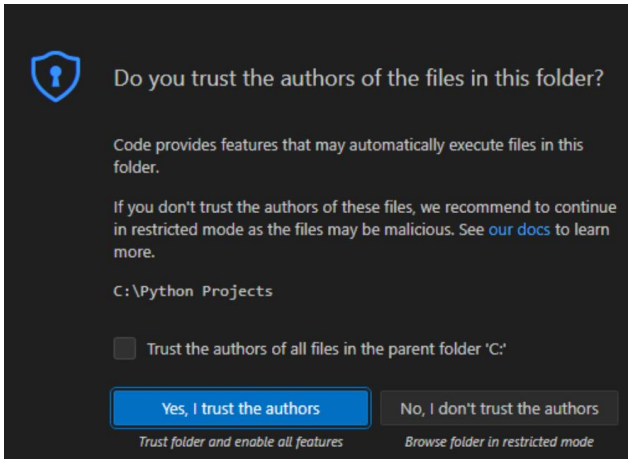
4. In the terminal, navigate to the folder you created and enter the following command
   `code .`

Note: You may have to reboot to update your system paths before this command will work

5. Visual Studio Code will automatically launch in your project folder



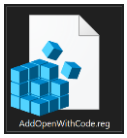
6. You can choose “Yes, I trust the authors” to allow VS Code to trust your project folder.



Add Visual Studio Context Menu Options (optional)

Sometimes, it can be useful to have the option to get to CS Code using the mouse instead of the terminal. Because we installed VS Code using WINGET, this option is not enabled during the install, and it is not available as a setting from within the application, because it requires editing the registry. If you want the “Open with VS Code” context menu options on a right click, do the following:

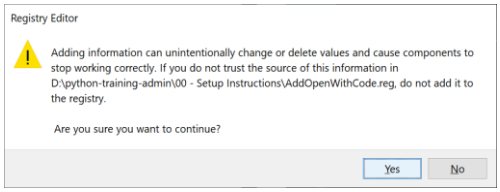
1. Create a text file anywhere on your PC and call it “AddOpenWithCode.reg”



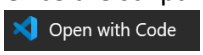
2. Edit the file in your preferred text editor and paste the text below. Make sure to replace all instances of “user_name” with your Windows username. Save the file.

```
Windows Registry Editor Version 5.00
 ; ***** Note: You must replace all instances of user_name with your username *****
 ;
 ; Open files
 [HKEY_CLASSES_ROOT\*\shell\VSCode]
 @="Open w&ith VS Code"
 "Icon"="C:\\Users\\user_name\\AppData\\Local\\Programs\\Microsoft VS Code\\Code.exe,0"
 [HKEY_CLASSES_ROOT\*\shell\VSCode\command]
 @="\"C:\\Users\\user_name\\AppData\\Local\\Programs\\Microsoft VS Code\\Code.exe\" \"%1\""
 ;
 ; This will make it appear when you right click ON a folder
 ; The "Icon" line can be removed if you don't want the icon to appear
 [HKEY_CLASSES_ROOT\Directory\shell\VSCode]
 @="Open w&ith VS Code"
 "Icon"="\"C:\\Users\\user_name\\AppData\\Local\\Programs\\Microsoft VS Code\\Code.exe\",0"
 [HKEY_CLASSES_ROOT\Directory\shell\VSCode\command]
 @="\"C:\\Users\\user_name\\AppData\\Local\\Programs\\Microsoft VS Code\\Code.exe\" \"%1\""
 ;
 ; This will make it appear when you right click INSIDE a folder
 ; The "Icon" line can be removed if you don't want the icon to appear
 [HKEY_CLASSES_ROOT\Directory\Background\shell\VSCode]
 @="Open w&ith VS Code"
 "Icon"="\"C:\\Users\\user_name\\AppData\\Local\\Programs\\Microsoft VS Code\\Code.exe\",0"
 [HKEY_CLASSES_ROOT\Directory\Background\shell\VSCode\command]
 @="\"C:\\Users\\user_name\\AppData\\Local\\Programs\\Microsoft VS Code\\Code.exe\" \"%V\""
```

3. Run the registry script as administrator, and choose the “Yes” option when prompted.



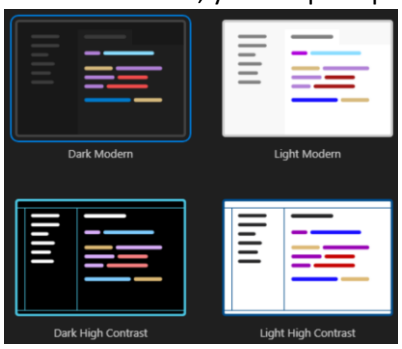
4. Once the script has run, you will now have the new option when you right-click.



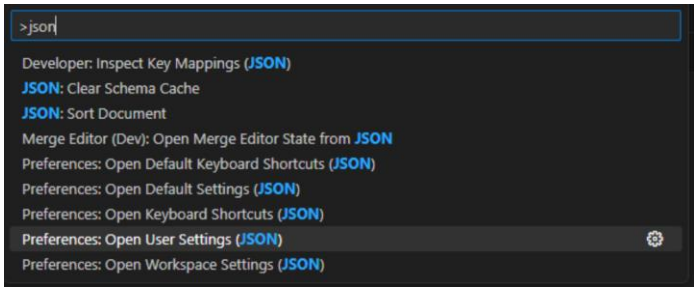
Customize Visual Studio Code

We need to set up VS Code and install a few add-ons before we're ready to start coding.

1. Set the Color Theme
   On initial launch, you are prompted to select a color theme. I usually select "Dark Modern"



2. If you installed Oh My Posh, you'll want it to work in VS Code just like it does in Windows Terminal. To do this, press [CTRL]+[SHIFT]+[P] to bring up the menu. Search for "json" and select the options titled "Preferences: Open User Settings (JSON)"

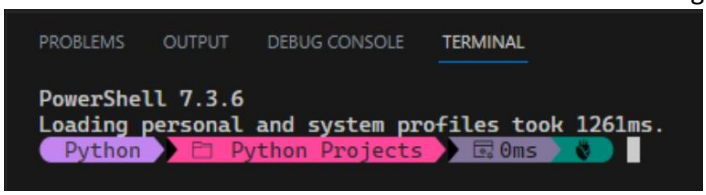


3. In the JSON file, add the following lines before the last closing curly-brace:

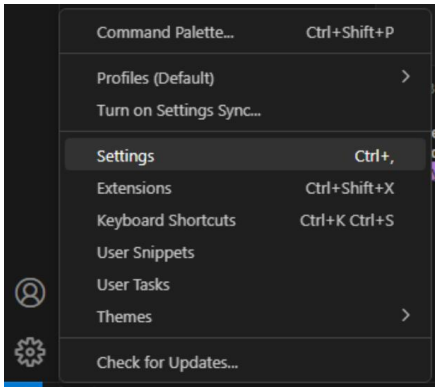
```
,
"terminal.integrated.profiles.windows": {
  "PowerShell": {
    "path": "C:\\Program Files\\PowerShell\\7\\pwsh.exe",
    "args": [
       "-noexit"
    ]
  }
},
"terminal.integrated.defaultProfile.windows": "PowerShell",
"terminal.integrated.fontFamily": "'CaskaydiaCove Nerd Font', monospace",
"terminal.integrated.fontSize": 14
```

4. Save the JSON file and click on Terminal > New Terminal

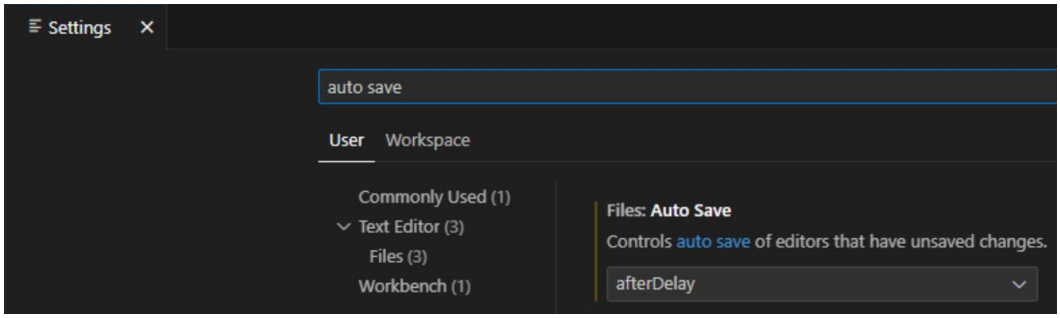
5. Your VS Code terminal should launch with the same settings you implemented for Windows Terminal



6. Click on the “settings” cog (at the lower left) and select “Settings”

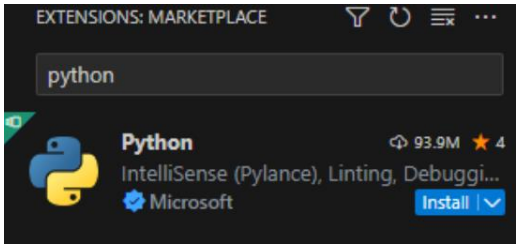


7. Search for “auto save” and change the “Files: Auto Save” setting to “afterDelay”
This ensures that your file changes save as you type and makes the process of updating and testing your code much quicker

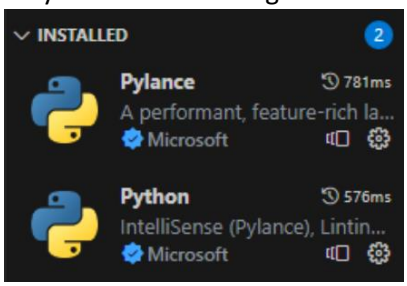


8. Click on the “extensions” icon on the sidebar

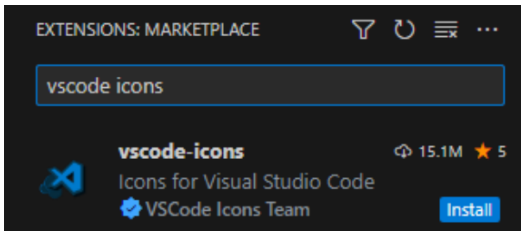
9. Search for “python” and install the Python extension



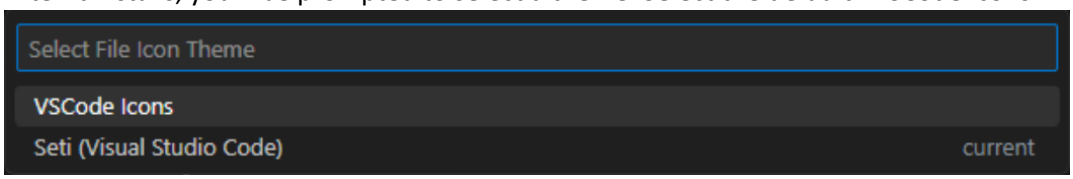
10. This also installs the Pylance component. You can install other add-ons if desired, but those are the only ones we need to get started with Python coding.



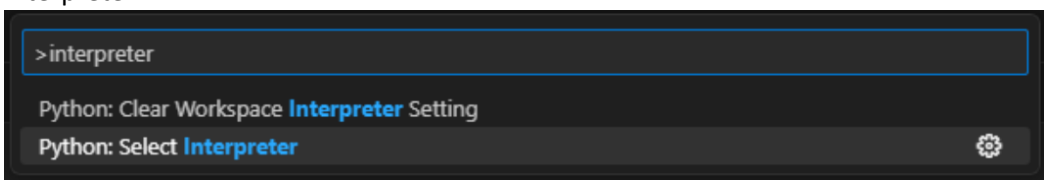
11. Search for “vscode icons” and install the extension



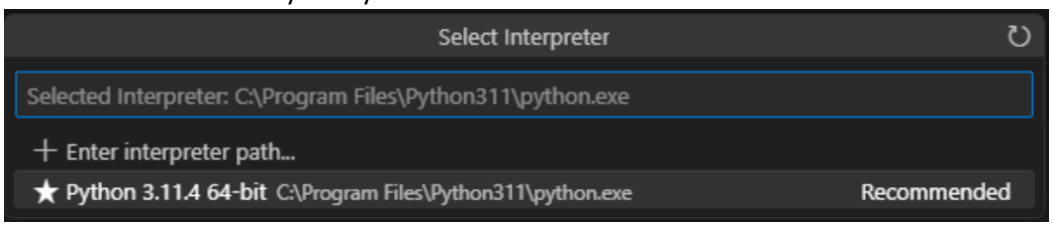
12. After it installs, you’ll be prompted to select a theme. Select the default “VSCode Icons”



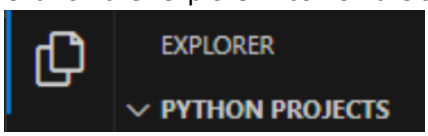
13. Press [CTRL]+[SHIFT]+[P] to bring up the menu. Search for “interpreter” and choose “Python: Select Interpreter”



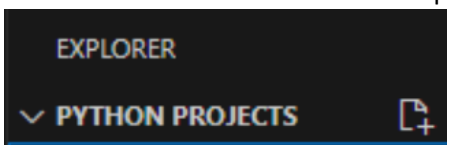
14. Choose the version of Python you installed earlier



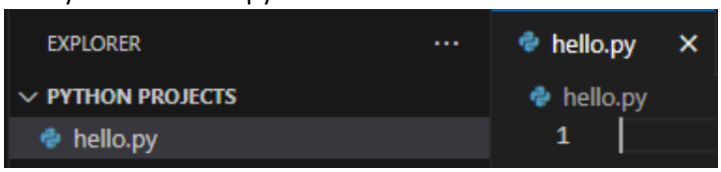
15. Click on the “explorer” icon on the sidebar



16. Click on the “new file” icon in the explorer

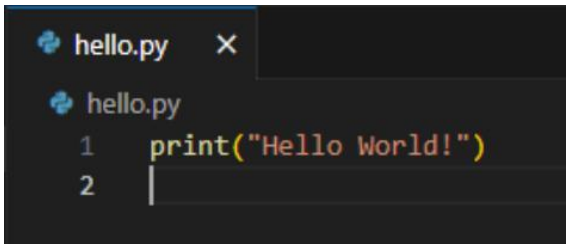


17. Title your file “hello.py”



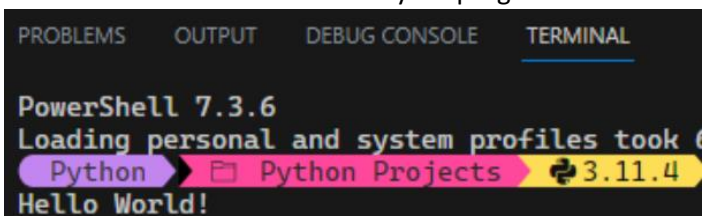
18. Enter the following code

```
print("Hello World!")
```



19. Click the “Run” icon on the toolbar

20. The terminal will launch and run your program. You will see “Hello World!” in the terminal



Set Up a Bitbucket (Source Control) Account

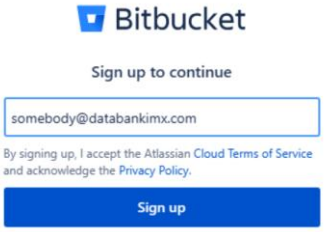
On the development team, we use Bitbucket as our source control system for code sharing. Since I share out development training repositories in the class, you'll need a Bitbucket account.

Note: If you already have a Bitbucket account, skip to step 8 below

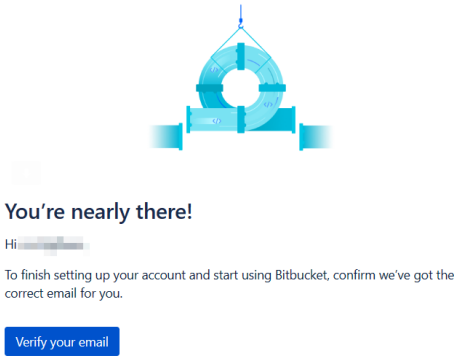
1. In a browser, navigate to https://bitbucket.org and click on [Get it free]

2. Click on [Next]

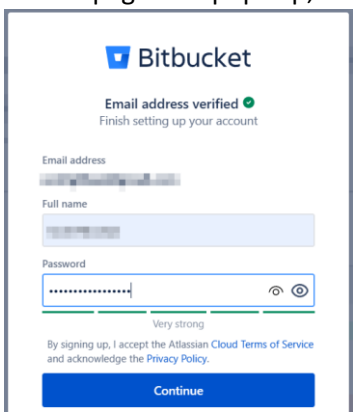
3. Enter your DataBank email address and click on [Sign up]



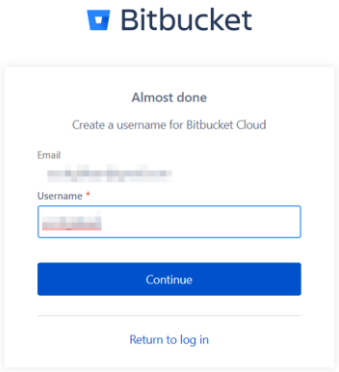
4. Check your email for a verification message. In the message, click [Verify your email]



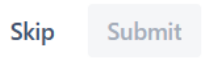
5. On the page that pops up, enter your full name and create a password



6. On the next screen, create a Bitbucket username

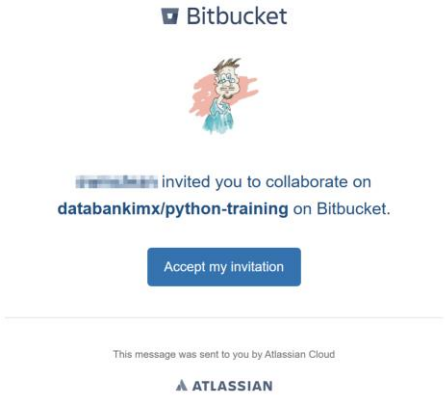


7. When you reach the survey page, just click on “Skip”

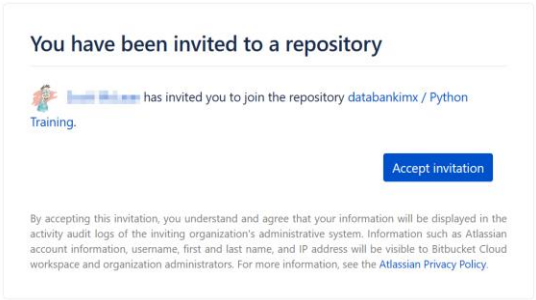


8. Email or Slack the class instructor with the email you used to sign up for Bitbucket

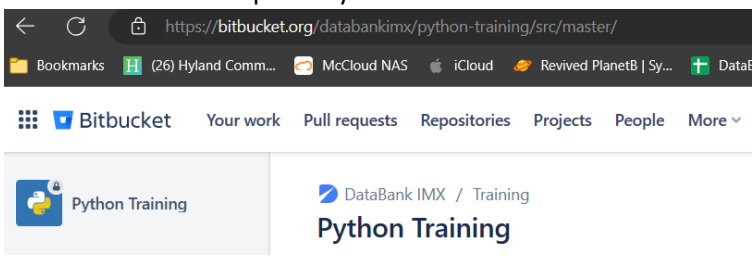
9. When you receive an email from me inviting you to the training repository, click [Accept my invitation]



10. Repeat that step on the page that launches



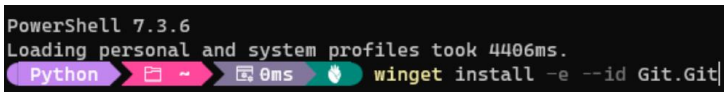
11. In a browser, navigate to https://bitbucket.org/databankimx/python-training and verify that you have access to the repository



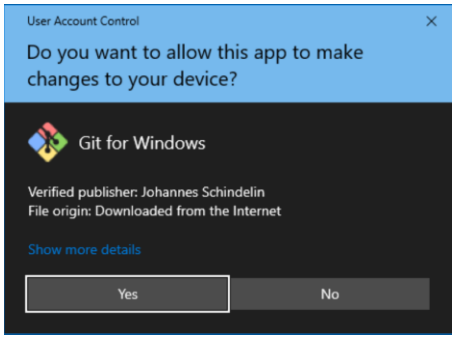
Install GIT

GIT is the underlying technology used to communicate with Bitbucket code repositories, so we'll need to install and configure it.

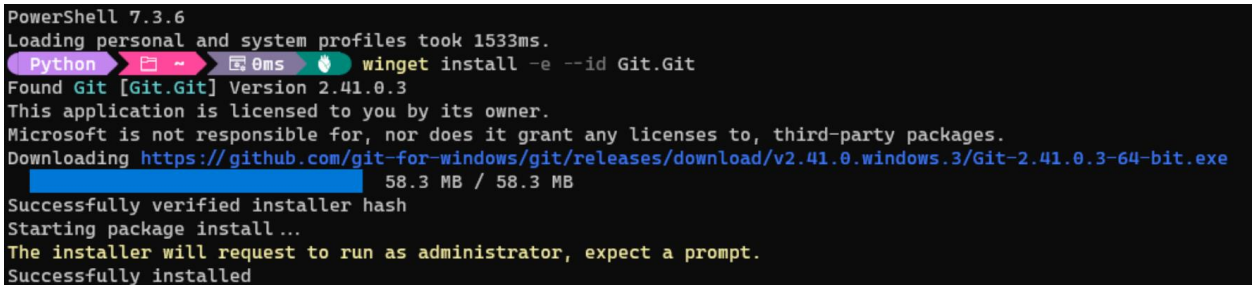
1. In your terminal, enter the following command
   `winget install -e --id Git.Git`



2. Accept the UAC alert



3. After successful installation, you'll see this:



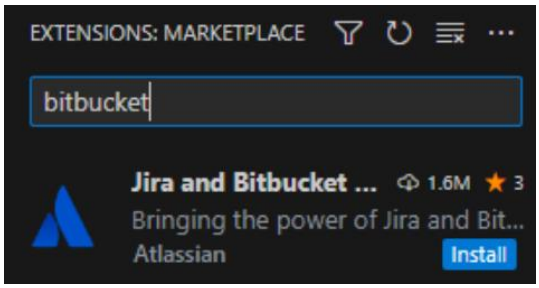
Set Up Visual Studio Code to Use Bitbucket

You'll need to configure the Bitbucket extension in VS Code in order to properly access the training repository.

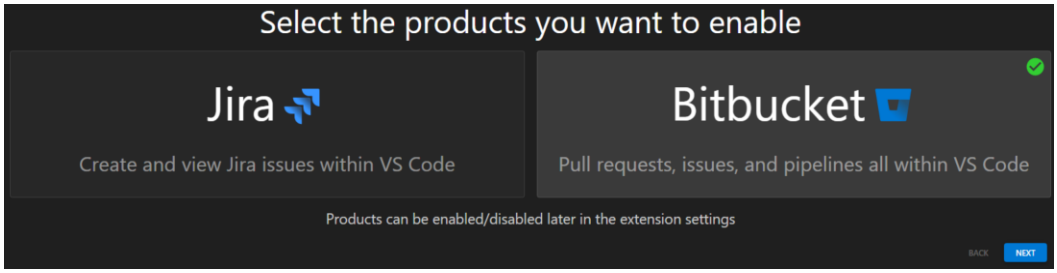
1. Launch Visual Studio Code

2. Click on the "extensions" icon on the toolbar

3. Search for "bitbucket" and install the "Jira and Bitbucket" extension

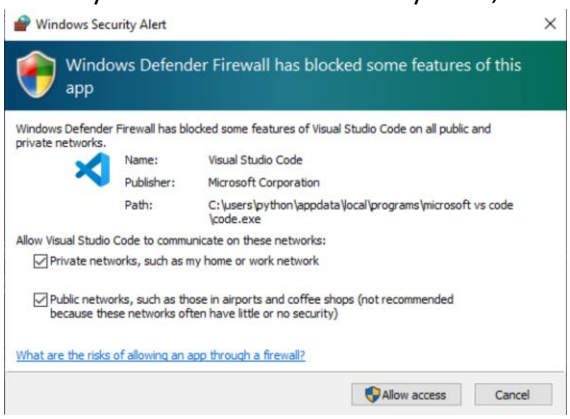


4. After the extension installs, it will launch a setup wizard. Unselect Jira and click [Next]

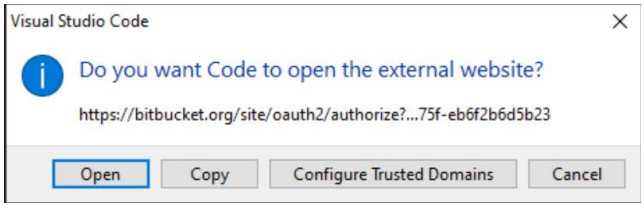


5. Select the option for "Bitbucket Cloud"

6. You may receive a firewall alert. If you do, click on [Allow Access]

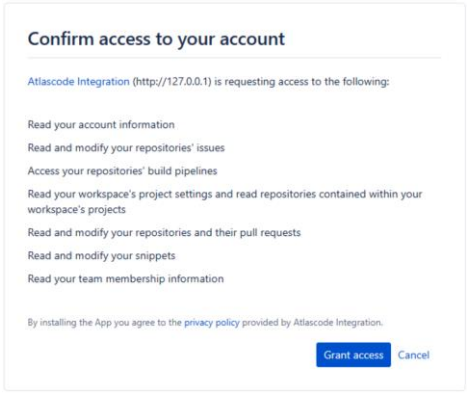


7. You'll be prompted to let VS Code access the Bitbucket URL. Click [Open]

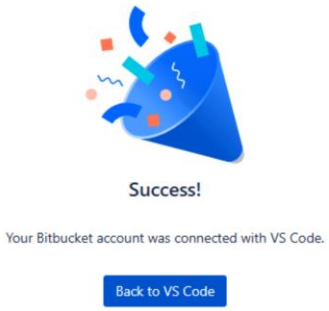


8. Log in

9. Click [Grant Access]



10. You'll see a success page. You can close the bowser after this comes up

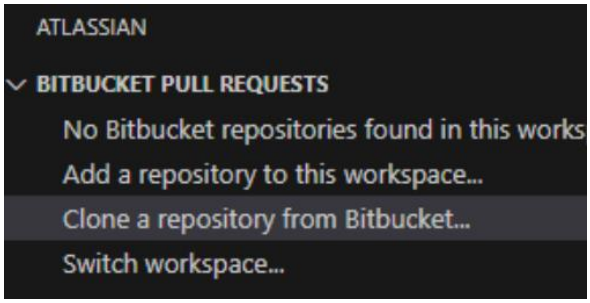


Clone the Python Training Repository

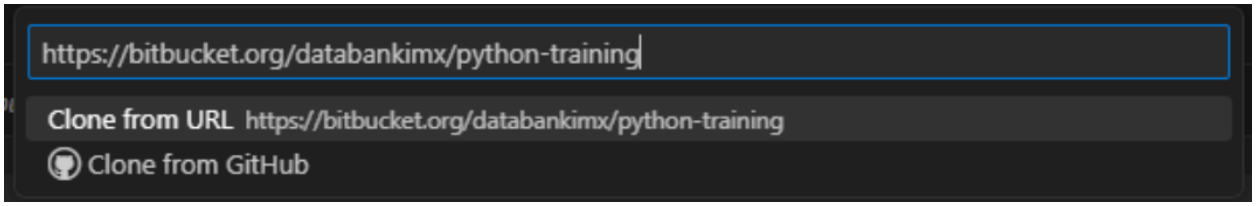
Finally, you'll need to clone a copy of the repository to work with.

1. Click the Atlassian icon on the sidebar

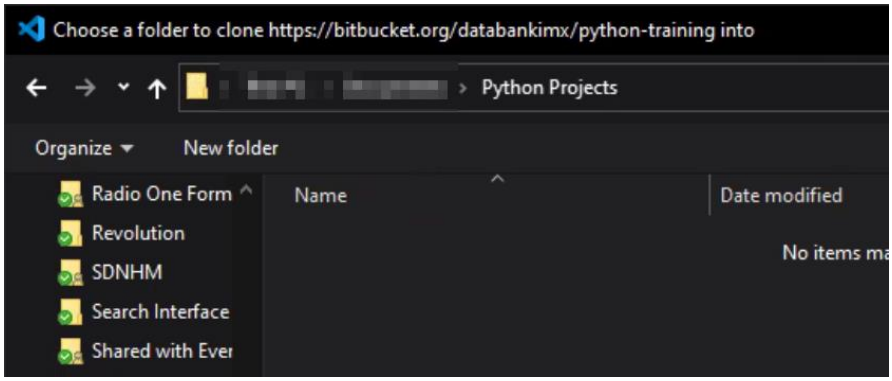
2. From the menu that pops up, select "Clone a repository from Bitbucket"



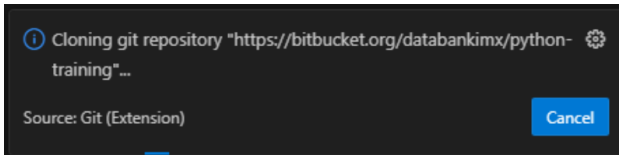
3. Enter the URL to our project: https://bitbucket.org/databankimx/python-training



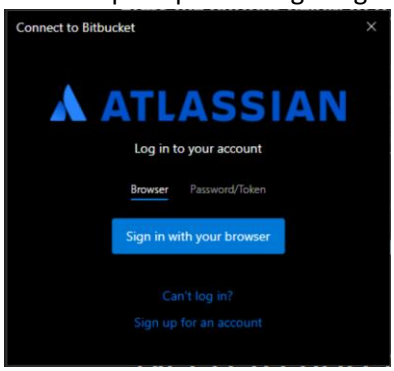
4. Select a path



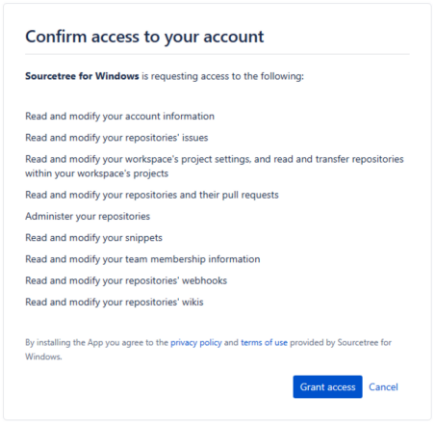
5. The repository will be copied locally to the path you selected



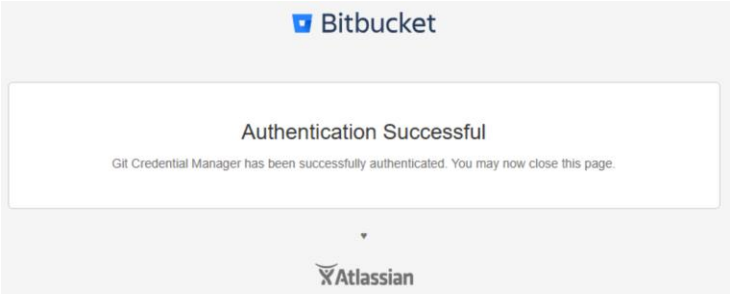
6. You'll be prompted to log in again



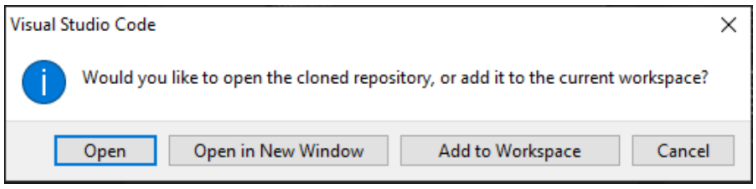
7. Grant access again in the web page that opens



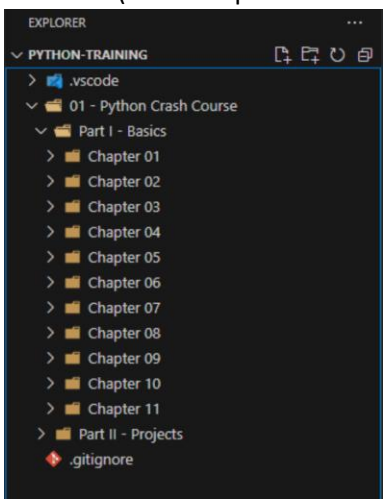
8. You'll see a success alert. After this, you can close the browser



9. When asked if you want to open the repository, click [Open]



10. The repository will open, and you should see a number of folders containing sample code from the textbook (with samples and commentary from me).



Congratulations! Your system is set up for Python training.

Happy Coding!