Before beginning this guide, it is important remember that all lines of code are case-sensitive. **<span style="color:red">Lines of code I write are shown like this.</span>** <span style="color:blue">Lines of code output by the computer are shown like this.</span> Make sure to read each numbered step in full before executing it.

If you haven't installed PyCharm before, start with **Installing Python** and work your way down. If you have already installed PyCharm and are having issues using vpython, <u>skip to the last section</u>.
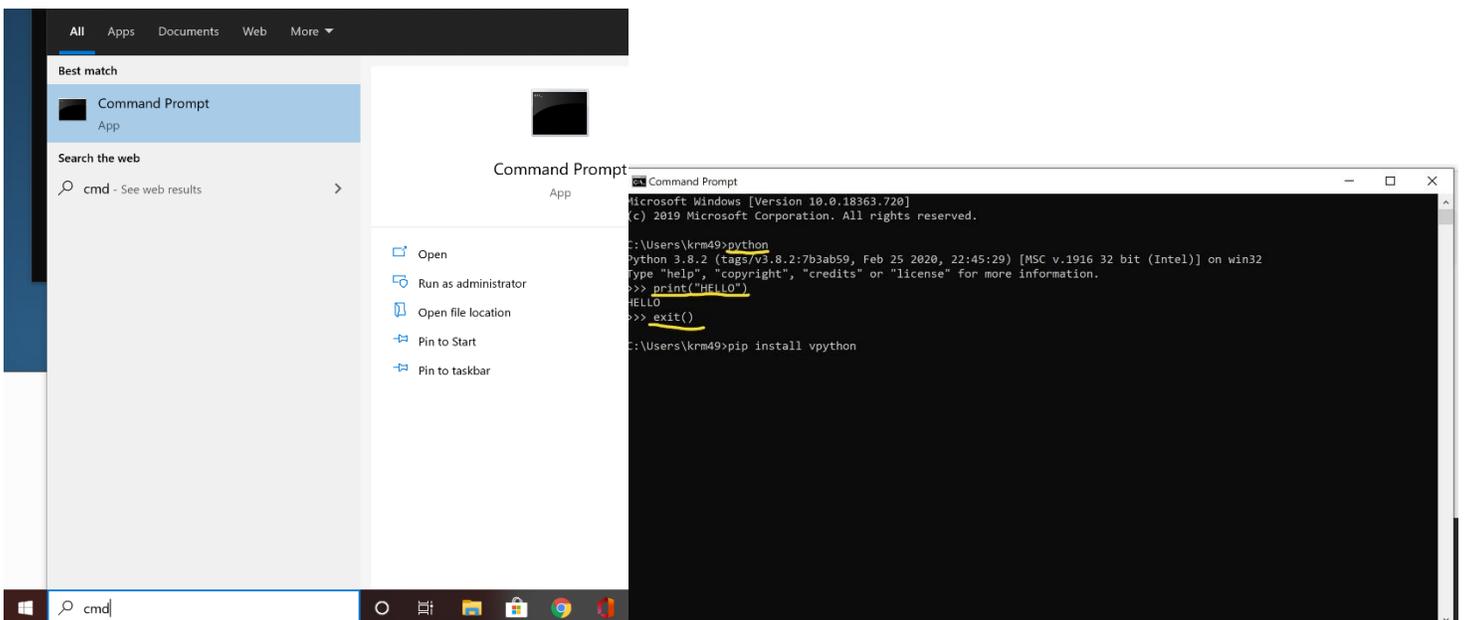
**Installing Python:**

1. Start with a web search for "Python download".
2. Navigate to the appropriate version for your computer(Windows, Linux, Mac, etc…) and press the bright yellow Download button.
3. Follow the download instructions and make sure to check the "==Add Python 3.8 to PATH==" option when prompted.



**Confirming Python is installed: (images below)**

1. Open the command prompt by typing **cmd** into the search bar and hitting enter (first image).
2. Type into the command line **python** and press enter(second image). If Python is correctly installed, the command line will return **Python 3.8.2** and some more information.
3. The command line will have **>>>** at the left-hand side. This means the computer is ready to read lines of Python code. We can confirm this by typing in a simple python function, like **print("Hello")**. In the command line, lines of code are executed soon as you press enter, so the command line will output **Hello** and immediately be ready to read more code.
4. Now that we have confirmed Python is correctly installed, let's type the function **exit()**to get us out of Python mode.

**Installing vpython:**

1. We are going to use the pip install tool that came with Python. Verify the command prompt is not in Python mode. That is, if the line begins with **>>>** , we must type the **exit()** function.

2. Type **pip install vpython**. This step will appear to do a lot of things and take a few minutes. Take care not to close the command prompt while it's working on the install. The word **Done** will appear multiple times, but this does not mean the install is complete. When finished, it will print **Successfully installed _____**. If unsure, try to type letters into the command line without hitting enter. If the letters appear, it's done. Otherwise, it's still busy.

```
>>> exit()

C:\Users\krm49>pip install vpython
```

**Confirming vpython is installed:**

1. In the command prompt, switch into Python mode by typing **python** and hitting enter.

2. Even though vpython is installed, we need to import it into every program like we did in GlowScript. Enter **from vpython import \***. This command doesn't appear to do anything, but now when we enter a function from vpython, the interpreter will know how to find it.

3. Let's create a box by entering **box()**. This command will open your web browser with a simple simulation with a box, just like in GlowScript.

```
Successfully installed MarkupSafe-1.1.1 Send2Trash-1.5.0 aiohttp-3.6.2 async-timeout-3.0.1 attrs-19
0 entrypoints-0.3 idna-2.9 importlib-metadata-1.6.0 ipykernel-5.2.0 ipython-7.13.0 ipython-genutils
.6.3 jupyter-server-proxy-1.3.1 mistune-0.8.4 multidict-4.7.5 nbconvert-5.6.1 nbformat-5.0.5 notebo
ts-2.6.1 pyrsistent-0.16.0 python-dateutil-2.8.1 pywin32-227 pywinpty-0.5.7 pyzmq-19.0.0 qtconsole
h-0.1.9 webencodings-0.5.1 widgetsnbextension-3.5.1 yarl-1.4.2 zipp-3.1.0

C:\Users\Elmo>python
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> from vpython import *
>>> box()
<vpython.vpython.box object at 0x0F9B0370>
>>>
```

**Installing PyCharm:**

1. Do a web search for "PyCharm community download". Make sure to download the free community edition.
2. While following the installation instructions, it is most important to make sure to check the box to add it to PATH. The other options aren't required. After installation, your computer must be restarted.
3. Now, we can open PyCharm for the first time. When prompted about importing settings, select the option, "do not import".
4. At this point we can customize our setup or hit skip and use the default settings.

**Creating Project / Setting up Interpreter:**

1. It's time to create a new project. Give it a name and hit the arrow to drop down the "Project Interpreter" information.
2. This is the most tricky part of this guide. Hit the bubble for "Existing interpreter" (circled in screenshot below), as the default one will not have vpython.
3. Hit the three dots and then hit the next three dots button.
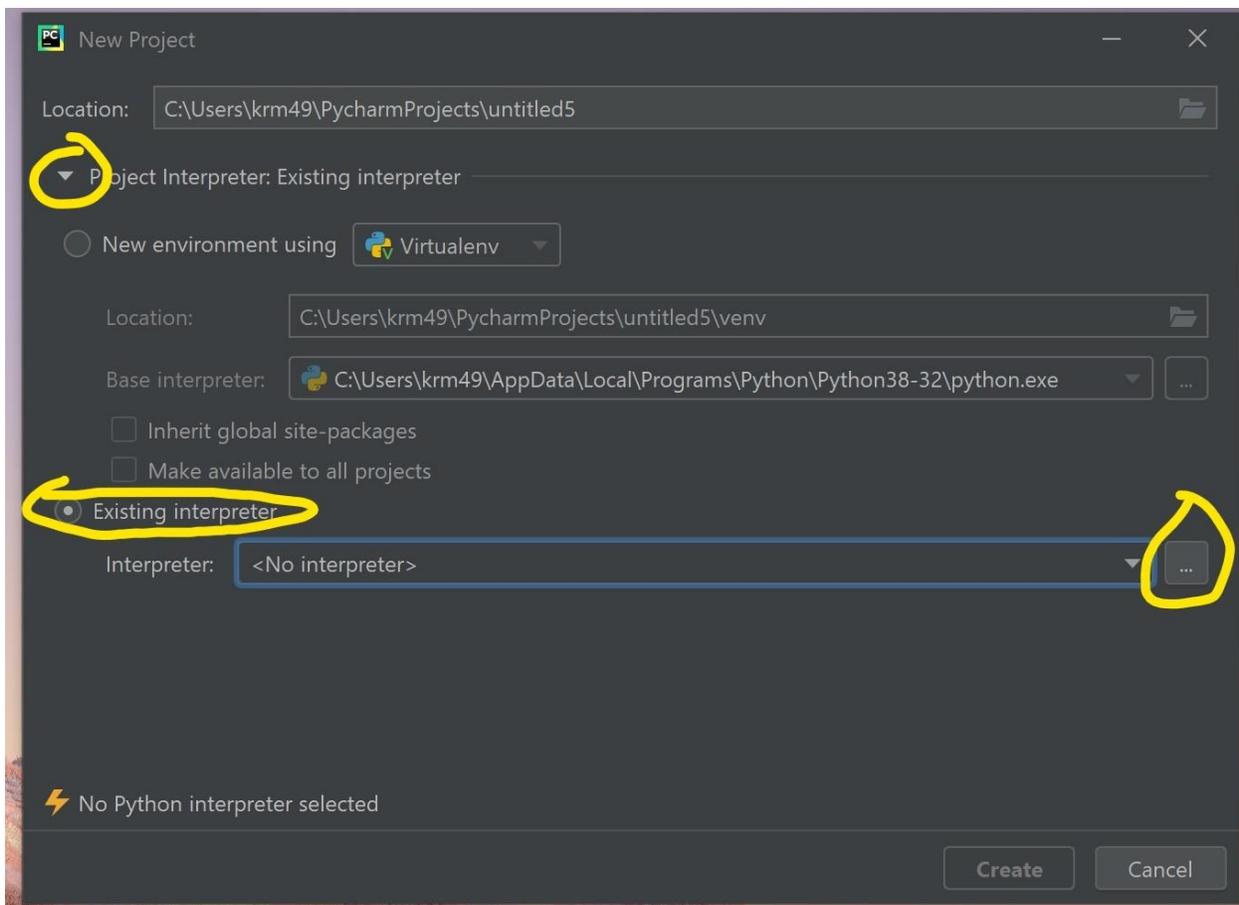
**Finding python.exe**

1. We need to find our python executable on our computer. Mine was by default installed to "C:\Users\Krm49\AppData\Local\Programs\Python\Python38-32\python.exe". ==To find some of those folders you will need to hit the eye icon on the top bar to show hidden directories==. NOTE: If you can't find python.exe, a cool trick is to head to your command line again and type **`where python`**. It will return exactly where the python executable is!
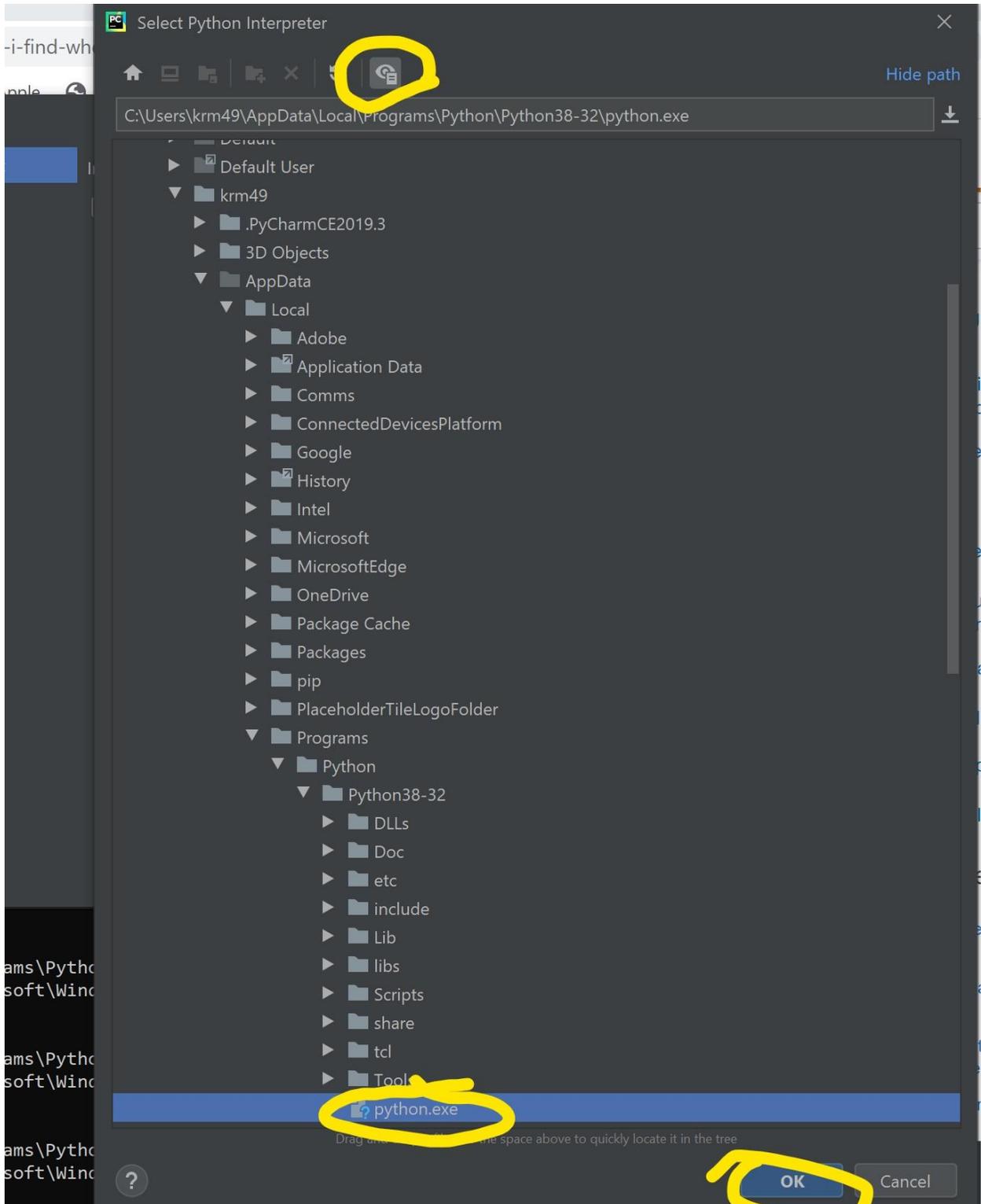
2. Now we can create our project. To create a new file in your project, find the title name in the top left area, right click, and create a new python file.
3. Give it a name and hit enter. We're now ready to start coding in PyCharm!
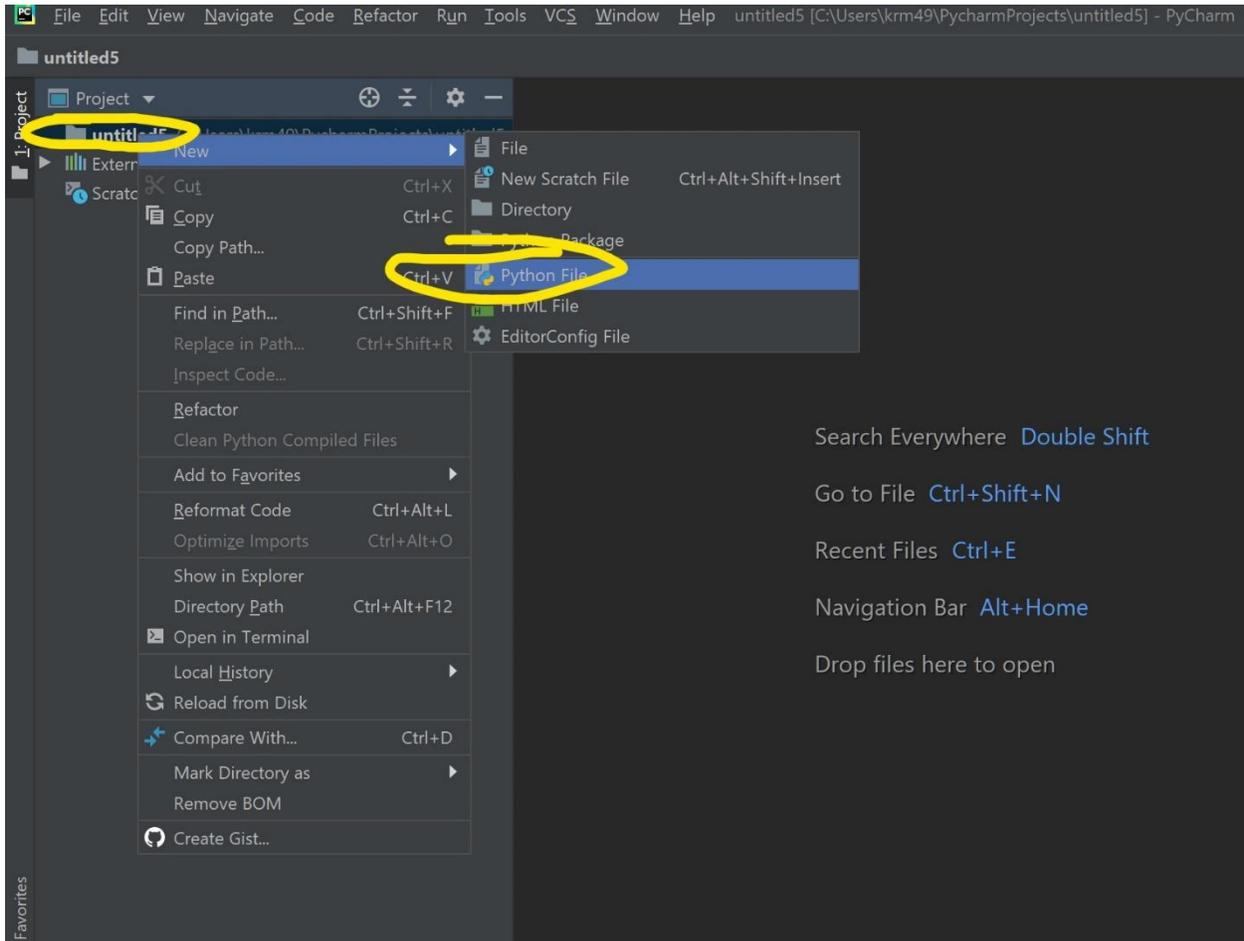
**Confirming vpython in PyCharm:**

1. In PyCharm, we import vpython by typing **`from vpython import *`** at the beginning of each program.
2. On the next line, type **`box()`**.
3. Now press **Ctrl+Shift+F10**. This is how we run a program in PyCharm. PyCharm will now open the web browser and display a box!
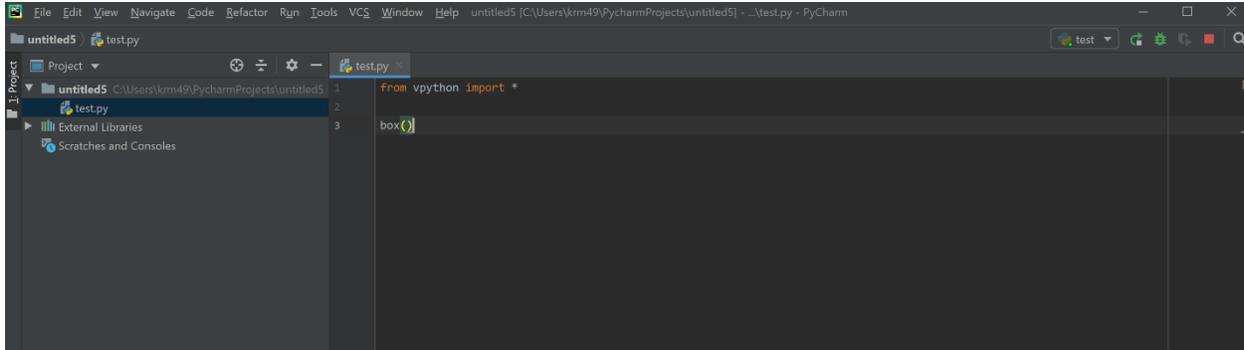


**That's it!** PyCharm is a powerful IDE with some great features that will make writing and maintaining code a much smoother experience. There are literally hundreds of great shortcuts and features, so you should check them out online if you're interested in becoming a pro. That said, here's a little starter-pack of simple shortcuts that will save any coder time and headaches.

**Alt + L**   This will automatically reformat all your code, adding spaces and lines to separate things out neatly. It will also get rid of excess space between lines or characters

**Shift + F6** When you have any NAME in your code selected, such as the name of a variable or function, this combo will allow you to re-name that item, and it will re-name every occurrence of it in your code! So when you've used a variable 20 times and don't want to have to re-type the name over and over, just use this.

**For those of you that already have Pycharm installed, but are having issues with using vpython…**

I believe this is either because of the way you installed vpython or how you set up your interpreter. Following these steps will fix either of those issues.

1. Open the command prompt visit the section above titled **Installing vpython.** Even if it is already installed, just follow the directions anyway and use the pip installer to install it again (if it is already installed, the pip installer will say so).
2. Continue with the next part, **Confirming vpython is installed,** just to make sure it's correctly installed and can be used in the command prompt.
3. Open up PyCharm and we will set the correct interpreter. When in a project in Pycharm, go to the bottom right of your screen where it says **Python 3.8**.
4. Click on that and hit **add interpreter**(first image). This can also be done from the settings menu, as shown in the second image.
5. Now just follow the directions above called **Creating Project/Setting up your Interpreter** and follow them to the end of the guide.

   NOTE: Every time you create a project, you will have to hit the bubble for existing interpreter, though it will save the location of python.exe.