

Assignment Project Exam Help

CS229

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Python & Numpy

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Angelica Sun

How does python relate to other languages?

Python 2.0 released in 2000

(Python 2.7 “end-of-life” in 2020)

Python 3.0 released in 2008

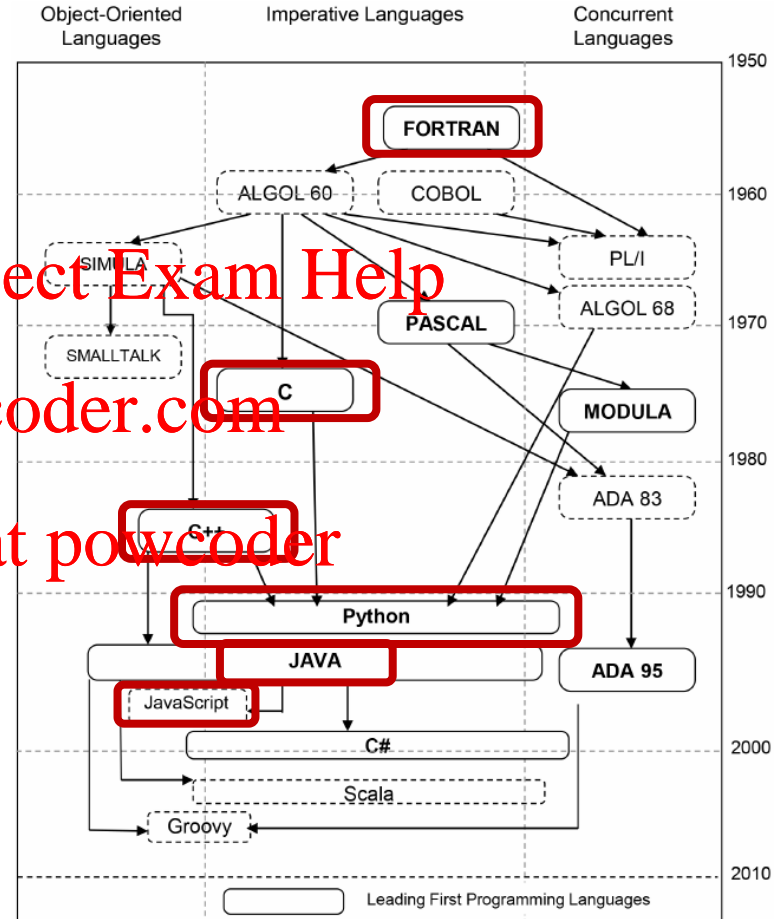
(Python 3.6+ for CS 229)

- Interpreted, like MATLAB
- Object-oriented
- Dynamically-typed

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Before you start

Always use **conda** for environment management

Create a new environment

```
conda create -n cs229 python=3.9
```

Create an environment (from configuration)

```
conda env create -f environment.yml
```

Activate an environment after creation

```
conda activate cs229
```

List existing environments

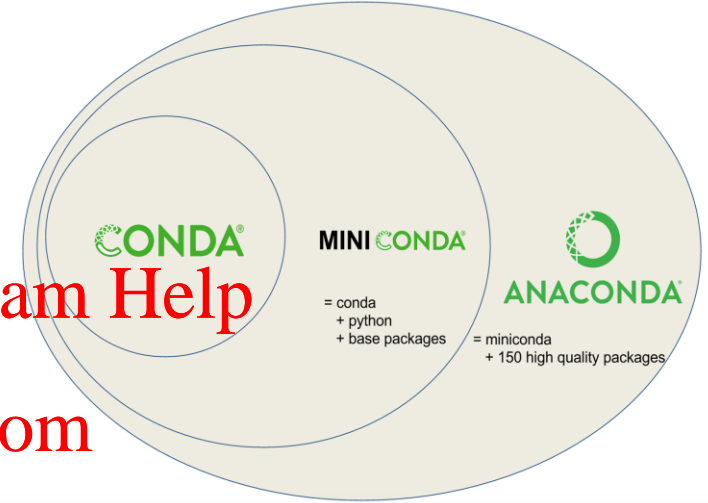
```
conda env list
```

Install a package in current environment

```
conda install PACKAGENAME (or pip)
```

More commands:

https://conda.io/projects/conda/en/latest/_downloads/843d9e0198f2a193a3484886fa28163c/conda-cheatsheet.pdf



Notepad is not your friend ...

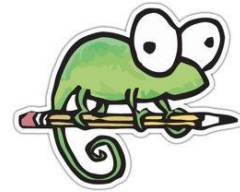
Get a text editor/IDE

- PyCharm (IDE)
- Visual Studio Code (IDE??)
- Sublime Text (IDE??)
- Notepad ++/gedit
- Vim (for Linux)

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To make you more prepared

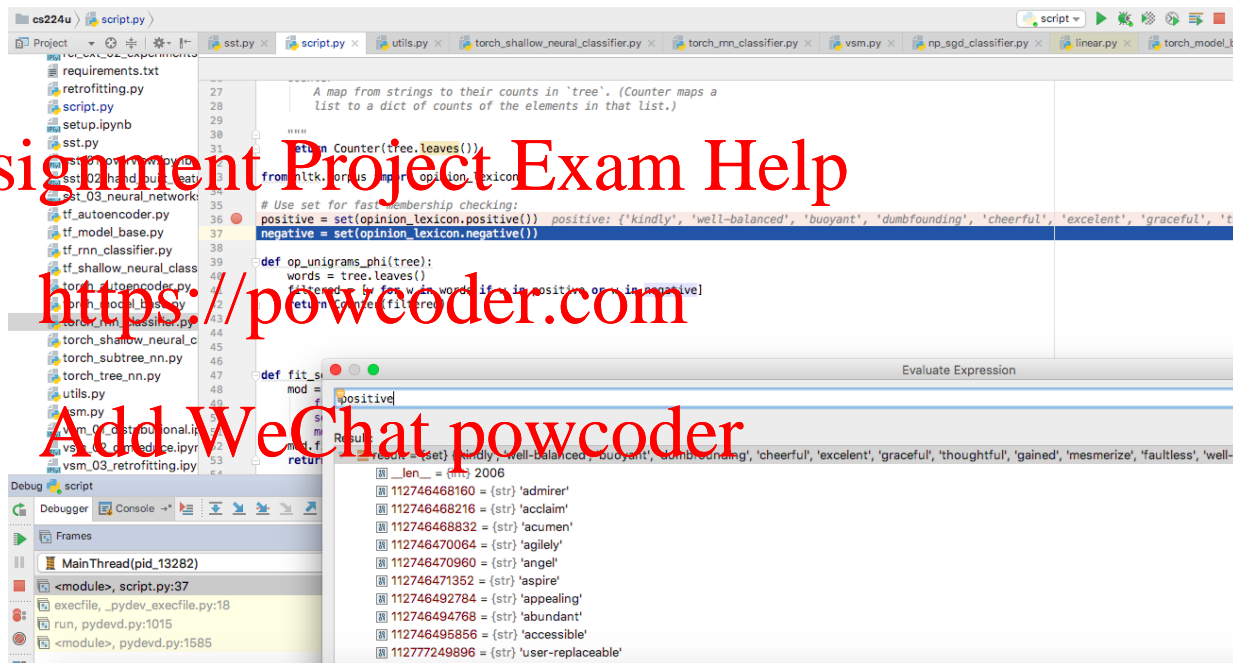
PyCharm

- Great debugger
- Proper project management

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FYI, professional version free for students: <https://www.jetbrains.com/student/>

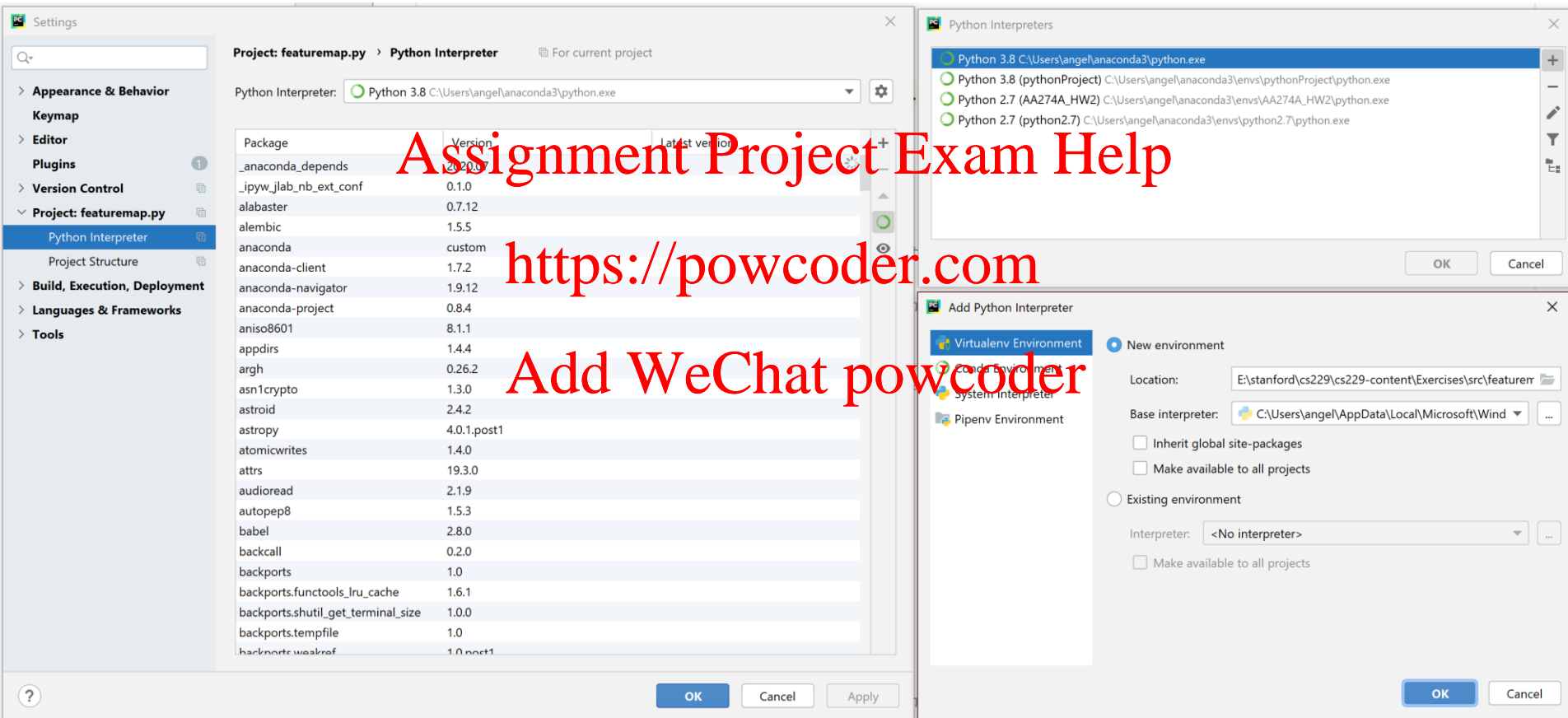
To make you more prepared

Using PyCharm with conda

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The image shows two overlapping PyCharm windows. The background window is the 'Settings' dialog, specifically the 'Python Interpreter' section for the project 'featuremap.py'. It displays a table of installed packages with their versions and the latest available versions. The foreground window is the 'Python Interpreters' dialog, showing a list of available interpreters. Below it, the 'Add Python Interpreter' dialog is open, showing options to create a new environment (Virtualenv, Conda, System, or PIPenv) or select an existing one. The 'New environment' option is selected, and the 'Base interpreter' is set to 'C:\Users\angel\AppData\Local\Microsoft\Wind...'. The 'Location' is set to 'E:\stanford\cs229\cs229-content\Exercises\src\featuremap.py'.

Package	Version	Latest version
_anaconda_depends	8.20.0	
_ipyw_jlab_nb_ext_conf	0.1.0	
alabaster	0.7.12	
alembic	1.5.5	
anaconda	custom	
anaconda-client	1.7.2	
anaconda-navigator	1.9.12	
anaconda-project	0.8.4	
aniso8601	8.1.1	
appdirs	1.4.4	
argh	0.26.2	
asn1crypto	1.3.0	
astroid	2.4.2	
astropy	4.0.1.post1	
atomicwrites	1.4.0	
attrs	19.3.0	
audioread	2.1.9	
autopep8	1.5.3	
babel	2.8.0	
backcall	0.2.0	
backports	1.0	
backports.functools_lru_cache	1.6.1	
backports.shutil_get_terminal_size	1.0.0	
backports.tempfile	1.0	
backports weakref	1.0.post1	

To make you more prepared

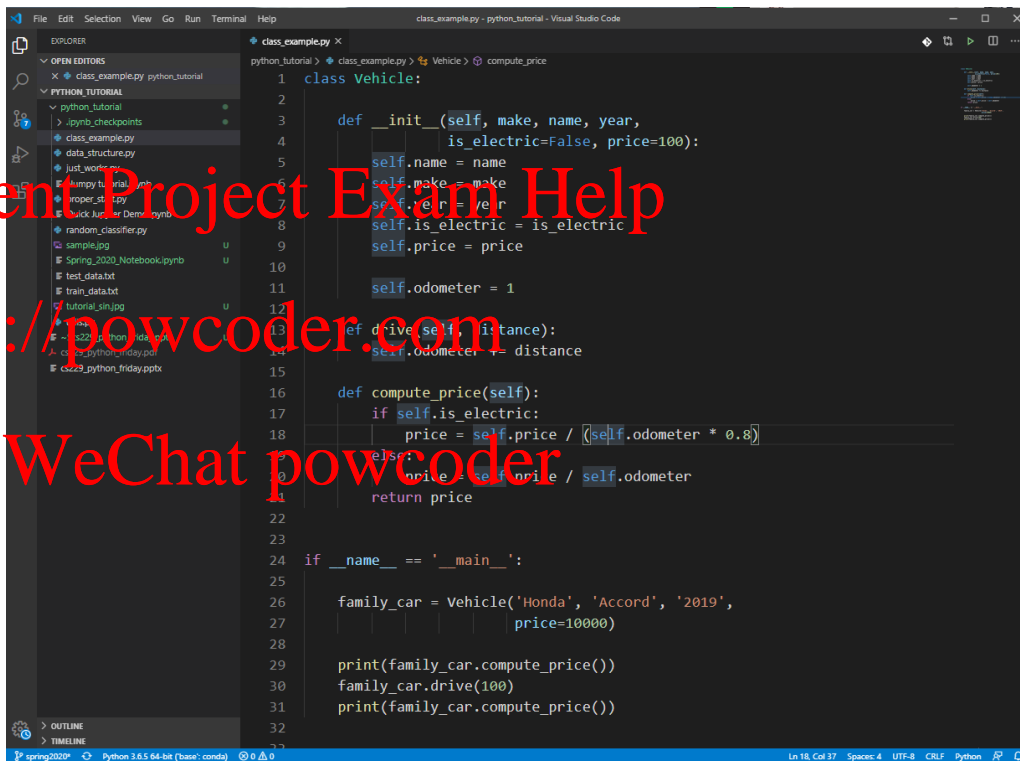
Visual Studio Code

- Light weight
- Wide variety of plugins to enable support for all languages
- Better UI

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```
class Vehicle:
    def __init__(self, make, name, year, is_electric=False, price=100):
        self.name = name
        self.make = make
        self.year = year
        self.is_electric = is_electric
        self.price = price
        self.odometer = 1
    def drive(self, distance):
        self.odometer += distance
    def compute_price(self):
        if self.is_electric:
            price = self.price / (self.odometer * 0.8)
        else:
            price = self.price / self.odometer
        return price
if __name__ == '__main__':
    family_car = Vehicle('Honda', 'Accord', '2019', price=10000)
    print(family_car.compute_price())
    family_car.drive(100)
    print(family_car.compute_price())
```

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Python

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```

> featuremap.py
  main.py
  utils.py
> External Libraries
  Scratches and Consoles

1  import numpy                                # import package
2  from matplotlib import pyplot as plt        # import from package and rename
3  from utils import *                        # import from local file
4
5  var = 10                                    # variables don't need type declaration
6  anothervar = "Hello"                      # codes written at indentation level 0 always get executed
7  print("I always get executed!")            # even when imported
8
9  def print_hi(name):                        # define a function
10     print(f'Hi, {name}')
11
12  class Foo:                                # define a class
13     def __init__(self, x):                  # constructor
14         self.x = x                          # use first formal parameter (named "self" by convention) for self reference
15
16     def printX(self):                       # functions are instance by default
17         print(self.x)
18
19     @classmethod                             # use decorator to declare class methods
20     def printHello(self):
21         print("hello")
22
23  class Bar(Foo):                            # inherit a class
24     pass
25
26  if __name__ == '__main__':                # main function (doesn't execute on import)
27     print_hi('CS229')                       # call function
28     functionInUtils()                       # call imported function
29     obj = Bar(3)                            # create object
30     obj.PrintX()                           # call function using object

```

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Live Demo in Jupyter Notebook

- Links:
- Notebook: **Assignment Project Exam Help**
<https://powcoder.com/http://cs229.stanford.edu/notes2021spring/notes2021spring/cs229-python-review-code.ipynb>
- PDF Version: **Add WeChat powcoder**
<http://cs229.stanford.edu/notes2021spring/notes2021spring/python-review-code.pdf>

Your friend for debugging

Python Command	Description
array.shape	Get shape of numpy array
array.dtype	Check data type of array (for precision, for weird behavior)
type(stuff)	Get type of a variable
import pdb; pdb.set_trace()	Set a breakpoint (https://docs.python.org/3/library/pdb.html)
print(f'My name is {name}')	Easy way to construct a message

Good luck on your
HW/Project!

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Questions?