

Python for Modeling, Machine Learning & Design

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Purpose of Lecture

- A guide and a description of the software suite for this course. You will learn where they are located and the different ways to get your copy and install on your system.
- The minimum hardware requirements to install the software.
- Integration and preparation for the lectures. Things to do before and after each lecture.

Fusion 360

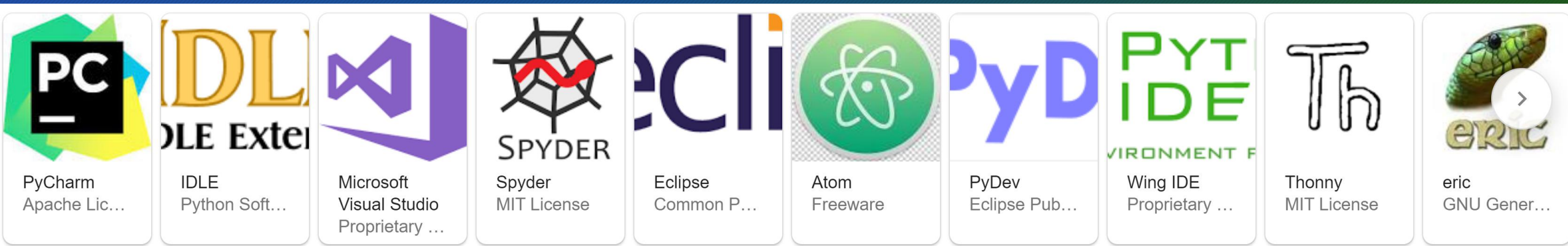
- This is the design environment we will use for the course. This course is not primarily to teach you Fusion 360. You may take another course for that purpose.
- We shall know and apply sufficient amount of Fusion 360 to learn to use its API to create graphical objects and learn Python in the process.
- If you already know Fusion 360, you are at an advantage. If not, it is an exciting opportunity to learn as we move along.

Python

- Python is perhaps the most popular beginner's language in the market today. It combines the best practices in Object-Oriented Programming in a rich function-driven environment. The results are as follows:
 - You can create simple scripts and applications without needing to get too deeply into the Object Model.
 - The Object model is there all along and you can create advanced applications that are fully Object-Oriented.
 - It has a huge array of libraries for most Scientific, Graphical and Artificial Intelligence applications.
- If you do these things outside of Python, you are probably working harder than you need to!

Visual Studio Code

- There are many ways to interact with the Python language.
 - The Command-Line, REPL or IDLE is often used in introductory courses.
 - The Integrated Development Environments, IDEs. The figure below is certainly not exhaustive. Many provide excellent fully integrated development systems to write, debug and run your code. We will focus on only one.
- The Visual Studio Code is the choice for this course
 - it is only here that you can integrate not only the coding, debugging and execution of your code, but the Fusion 360 API environment as well.



Fusion 360 Acquisition/Installation

- The three software suites we use for this course can be acquired online. Fusion 360 retails for US\$495.00 per year. As a student, you can get a free copy that comes with credits for using their cloud facilities.
- Visit their [Educational Page](#) and follow the instructions that apply to you. There are several interesting software you are presented with. The one for this course is Fusion 360.

Install Python

- We describe here the simplest way to go about things here. There are other methods, but time does not permit exhaustive treatment.
 1. Install Python by visiting python.org look for Downloads there and find version 3.7.6 It is not the most recent version, but it is the one tested to work with the other software we will integrate with it.
 2. You may also install the latest if you want as the Visual studio Code IDE allows you to specify the version of Python you want to run a project on. It is therefore possible to have several versions at the same time.

Install Visual Studio Code

- Get the Visual Studio Code installed from the organization that produces it: <https://code.visualstudio.com/download>.
- It is easy and quick to complete the installation. The [download link](#) is shown above.
- We have tested all these on the 64 bit windows 10 machine. Please select these options and make sure that you have a system that can handle it.

Install Python and Visual Studio Code, Cont'd

- Do this installation by yourself.
 - There are people making YouTube videos for these. Use them if you care to.
 - Took only like 10 minutes for both installed and they are simple to follow.
- Make sure you read the instructions
 - Accept that either code places itself on the search path of your computer logic. After installation, restart your computer to activate the “Path”. This way, they will be able to find each other. Fusion 360 will find VSC on its own
 - Fusion 360 automatically defaults to using visual studio code. More fanciful environments such as PyCharm, Anaconda Studios can be used for this. But, if you want the easy way to do things, Use Visual studio code.