

Primer on Python & Jupyter Notebook

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version 2.0

Before you can code in CS103, you must prepare your coding environment. This document may be used as a reference for the issues that arise surrounding this issue: preparing to code.

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How to get onto Canvas

Canvas is UAB's learning environment and includes important information about CS103.

24-hour rule: you should login to Canvas every day and find out what is new, such as announcements and recent postings of lectures and code. I will deliver all my lecture slides to Canvas, usually within an hour of the end of class. I will also post a lot of Python code on Canvas, such as the illustrative code that I go over each day in class. There is a lot of other important information on the CS103 Canvas page.

The standard way to get onto Canvas, especially the first time, is:

- visit the Canvas landing page at <http://www.uab.edu/elearning/canvas>
- you can also find this site by googling 'Canvas UAB'
- click the 'Canvas Login' icon (a big red gear on the upper right)
- to get into your CS103 lecture page, click the Courses tab on the left column and choose FA2025CS 103-2B Introduction to CS in Python
- While you are on Canvas, please download the HW1 materials (`hw1.pdf` and `hw1.ipynb`).

Python

In CS103, you will code in **Python 3**. Python is an easy to learn, powerful programming language. It was created by Guido van Rossum during 1985- 1990. The programming language is named after BBC's TV Show – '**Monty Python's Flying Circus**', not after the snake. Like Perl, Python source code is also available under the GNU General Public License (GPL). Python 3.0 was released in 2008 and was a major revision of the language and it is getting more and more popular every day.

Anaconda

Anaconda is a Python distribution and an effective package manager that contains a collection of many open-source packages such as numpy, pandas and scipy. If you need additional packages in the future (we will need some in the following weeks), you can use the Anaconda's package manager to install those smoothly. We will be showing different Operating system installation and try to address common installation issues in this primer. Please follow the instructions to set up Anaconda environment on your Operating System.

Detailed instructions on installing Anaconda are here (<https://docs.anaconda.com/anaconda/install/>).

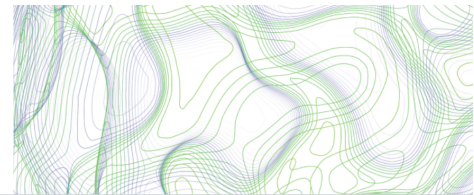
Distribution

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You can create an account using your personal or uab email. The next page includes my advice on specific installations. But first some context and advice on how to answer the questions that they will ask as you install. Also, before you embark on this installation, and indeed any installation, first skim the entire documentation on the installation, then carefully read the documentation as you install. If you have a Windows machine, please use the 64-bit installer.

Operating System (OS)




When installing software, there will be 3 sets of instructions, based on your computer's underlying operating system (OS). There are three main families of OS: Windows, macOS (on an Apple, aka Darwin), and Linux. There are many flavors of Linux (Ubuntu, Debian, Arch Linux, Fedora, etc) but we will bundle all of these under the term 'Linux'. There are many flavors of

hardware that run Windows (e.g., HP, Dell, Lenovo). macOS and Linux are very similar, since they are both based on Unix, so we can sometimes bundle operating systems more simply as Windows and Unix-based. However, Windows and Unix-based systems are very different.

OS version

Anaconda requires a relatively modern operating system, so you may need to upgrade your OS before installing. macOS 10.13 (High Sierra) or later; Window 8 or later; recent Linux. If you absolutely cannot upgrade, the installation website has tips on looking for an older version of Anaconda installation that may be compatible with an older OS.

Anaconda Installers

Windows	Mac	Linux
		
Python 3.12	Python 3.12	Python 3.12
64-Bit Graphical Installer (912.3M)	64-Bit (Apple silicon) Graphical Installer (704.7M) 64-Bit (Apple silicon) Command Line Installer (707.3M) 64-Bit (Intel chip) Graphical Installer (734.7M) 64-Bit (Intel chip) Command Line Installer (731.2M)	64-Bit (x86) Installer (1007.9M) 64-Bit (AWS Graviton2 / ARM64) Installer (800.6M) 64-bit (Linux on IBM Z & LinuxONE) Installer (425.8M)

wifi

Anaconda is a large install, so have a good wifi connection as you start the install.

Python 3

If you are asked during your specific install to choose between Python 2 and Python 3, you guessed it, choose Python 3. And the version numbers after 3 are irrelevant to us (so 3.7 = 3).

Pycharm (not)

They will ask you if you want to install PyCharm as part of the install. We will be using Jupyter Notebook as an editor, so there is no need to install PyCharm. You can always install PyCharm later if you want to try it out.

problem?

if installation fails for some reason, and you want to try again, here are instructions on how

to uninstall: <https://docs.anaconda.com/anaconda/install/uninstall/>

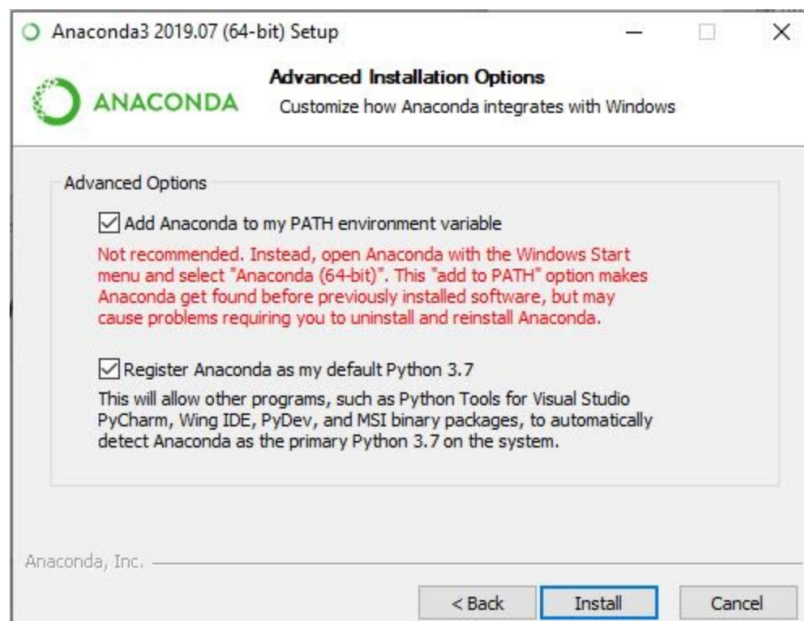
Great, now you can go ahead and install by checking the specific instructions below.

Anaconda Installation for Windows

1) Use your internet browser to visit the Anaconda official web site:
<https://www.anaconda.com/products/individual#Downloads>

On the left, you will see two options for the Windows machines, choose the appropriate one and download the graphic installer. Please note that we will be using Python 3 in this course.

- 2) Double click the installer to launch.
- 3) Click Next
- 4) Read the licensing terms and click “I Agree”
- 5) We will be installing Anaconda for the current user, thus select “Just Me” option.
- 6) Now we will be selecting a destination folder to install Anaconda, you can leave it default and hit Next button.
- 7) *** **Important step:** Choose “Add Anaconda to my PATH environment variable”. And “Register Anaconda as my default Python 3.x” options then click Install.



Verification

Python is not usually included by default on Windows machines; however, we want to check that our machine has Anaconda as the default Python interpreter.

Go to start menu and type Command Prompt to start it.

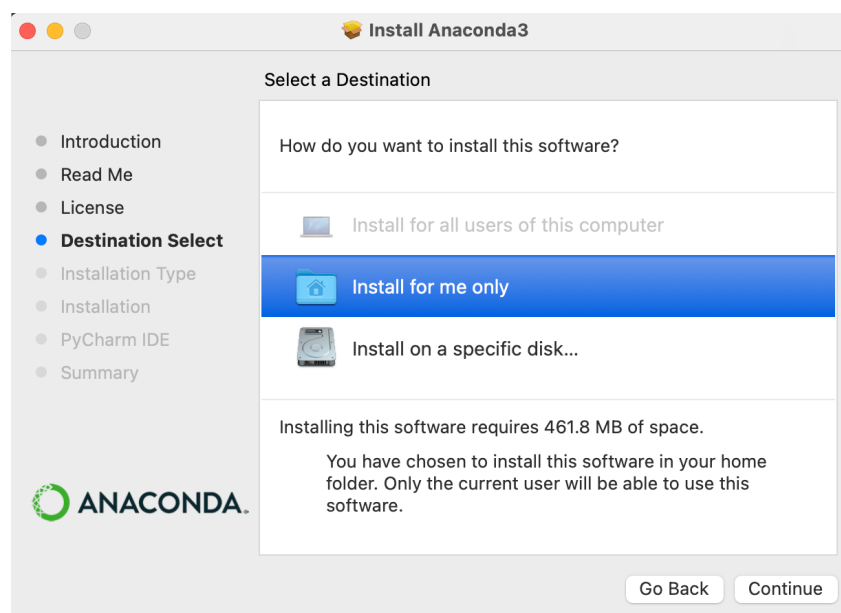
Type the following command:

```
python --version
```

If you see Anaconda version, that means your installation was successful.

Anaconda Installation for Mac

- 1) Use your internet browser to visit the Anaconda official web site:
<https://www.anaconda.com/products/individual#Downloads>
- 2) In the middle, you will see two options for the MacOS machines, click the 64-Bit Graphical Installer and download the package
- 3) Click the downloaded file and start the installation
- 4) Answer the prompts on the Introduction, Read Me, and License screens
- 5) You need to select a destination to install the software, select “Install for me” option



- 6) Click Install
- 7) If your installation is successful, you will see a “Thank you...” message

Verification

Start terminal on your machine (search “terminal” or find the terminal icon in your Launchpad)
type

```
python3
```

If you see Anaconda distribution, that means your installation was successful

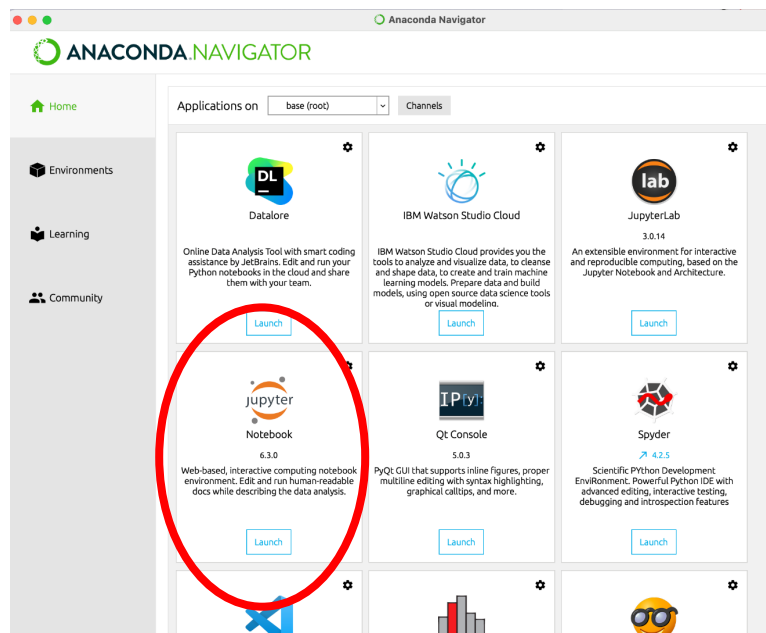
Anaconda installation for Linux

Please check the official Anaconda documentation link below and find out your specific Linux distribution installer. If you are having difficulties with this documentation, feel free to ask help <https://docs.anaconda.com/anaconda/install/linux/>

Jupyter Notebook

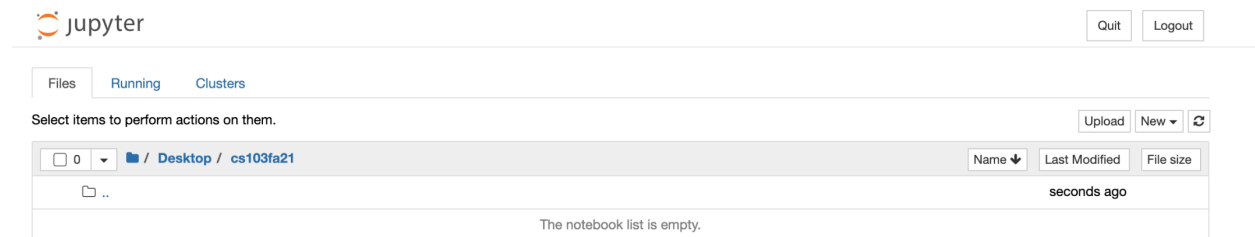
There are two simple ways to start Jupyter;

- 1) You can start your terminal/Command Prompt and type
`Jupyter notebook`
It will start Jupyter on your default browser.
- 2) We have already installed “Anaconda Navigator”. Run the application (Windows users, check your start menu, MacOS/Linux users: search it)
You will see the Jupyter Notebook in the application window. Click “Launch” button



Notebook Dashboard

When the notebook opens in your browser, you will see the Notebook Dashboard. Here, you will see the list of your folders, files, and notebooks. You can open a previously created/saved notebook here and you can create a new one as well.

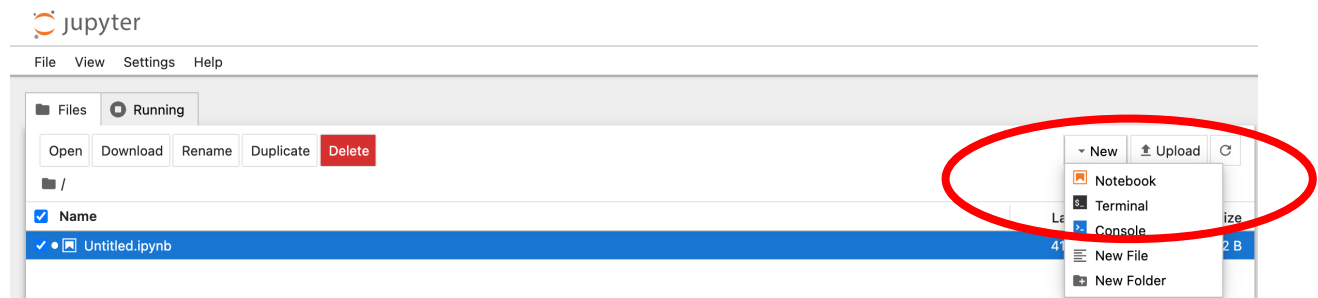


I suggest we create a **cs103fa25** folder on your desktop (or any other location you wish) and we will be creating a subfolder for each lab and homework assignments.

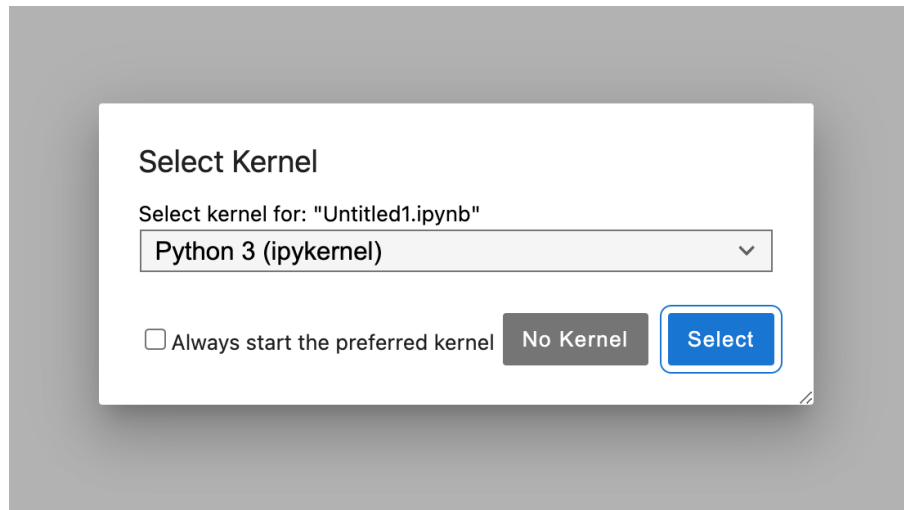
I have created mine on desktop, and I will create a **lab01** folder inside my cs103fa25 folder. After you create your lab01 folder, go back to your notebook dashboard and navigate to lab01 folder.

We will create a new notebook here called **lab01.ipynb** step by step:

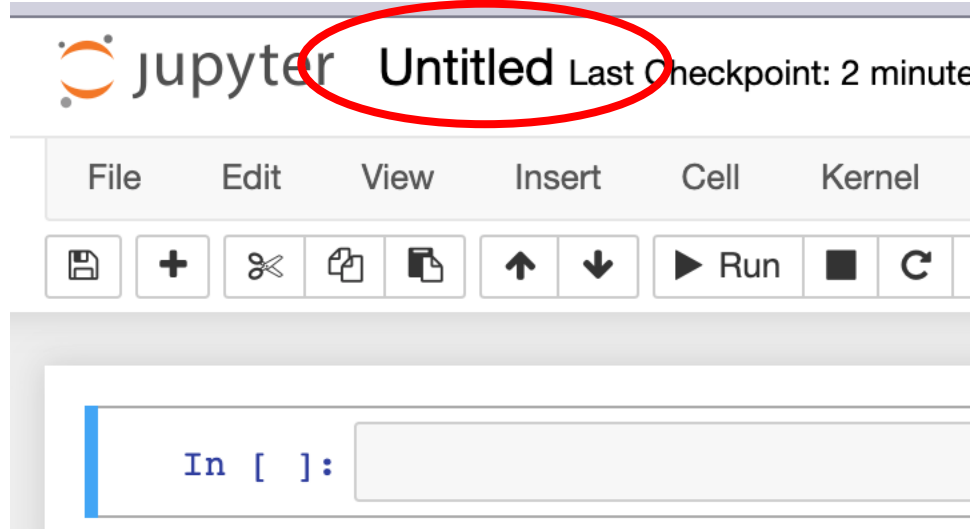
- 1) after you launch the notebook dashboard and navigate to the lab01 folder, you will create a new Python3 file (right handside)

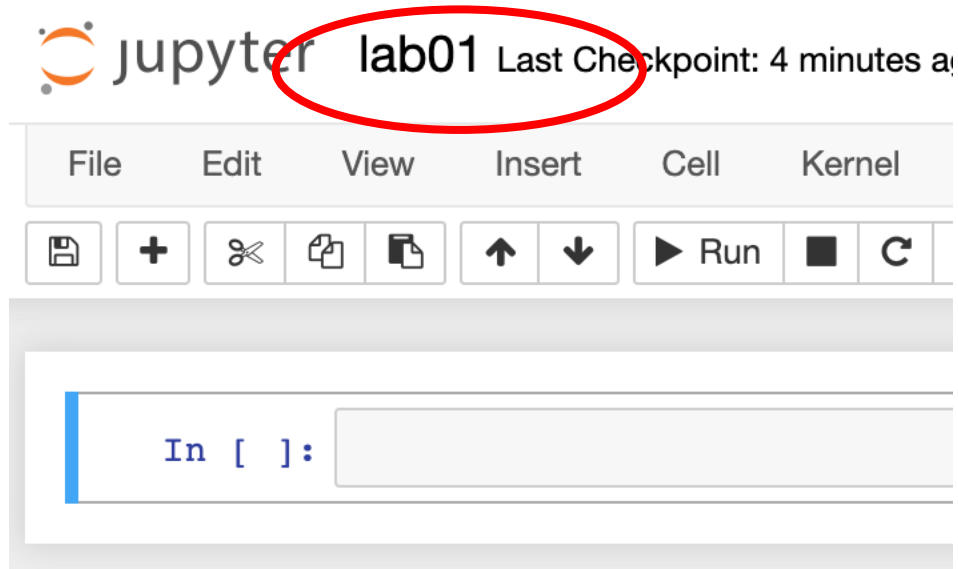


It will ask you to choose the kernel. Choose Python 3(ipynkernel). You can select the “Always start the preferred kernel” option as well

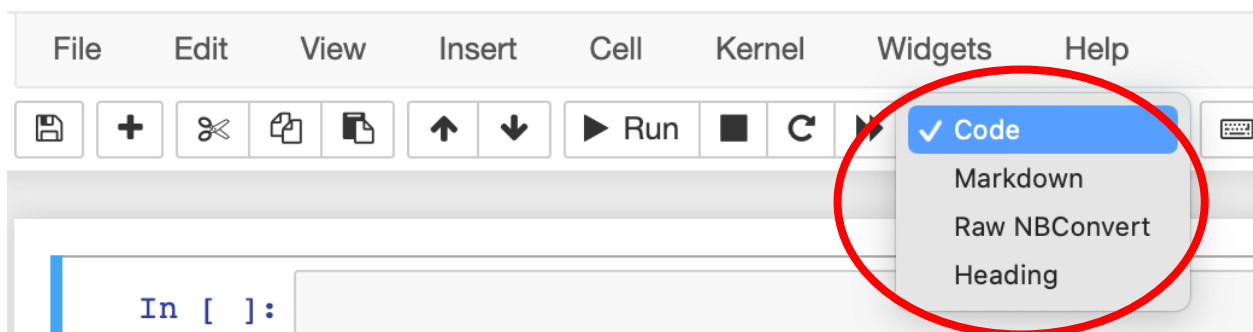


- 2) Your new notebook is ready, now it is time to give a name to it. On the upper left corner, next to the Jupyter logo, you will see that your file is named as “Untitled”. Let’s change it, name “lab01”. Now your notebook filename is lab01.ipynb



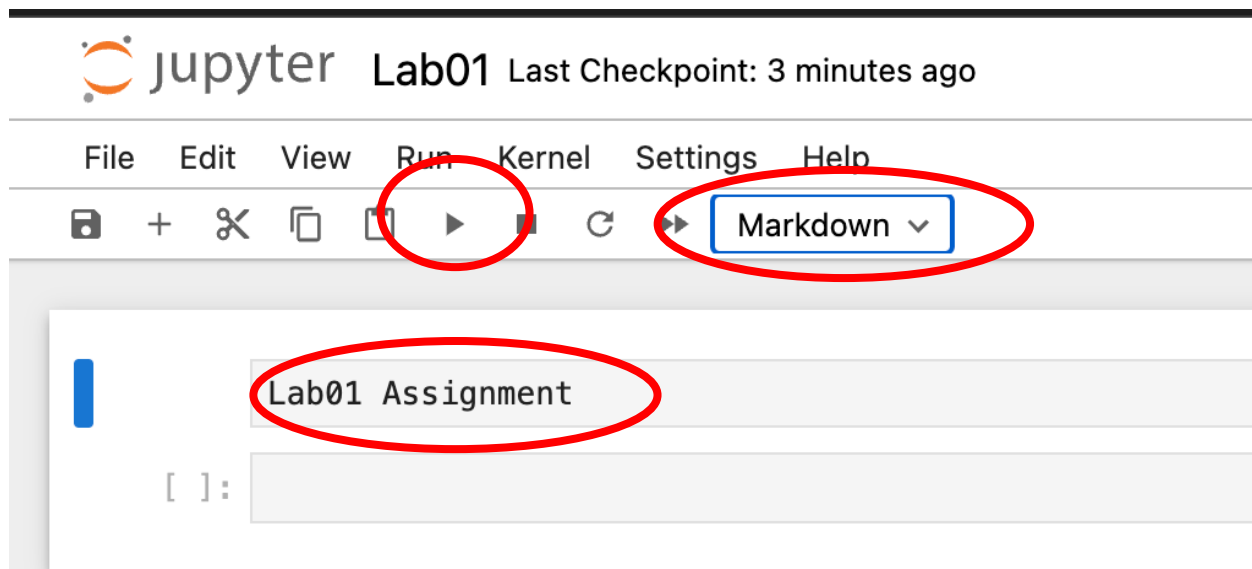


This is the file that we will be creating some exercises today. In this notebook we can create text (just like a regular text editor) and code(script). You can change the mode of the cell in the dropdown menu by switching between “Code” and “Markdown”

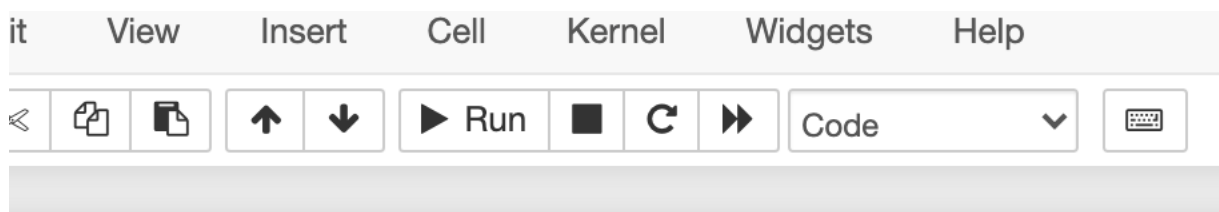


Lab01 Assignment

We will create two markdown cells to display the title of the assignment and our personal info. Select the first cell and convert it to Markdown. After you type “lab01 Assignment” hit the Run button (we must hit this button anytime we make a change on each cell)



Now, you will see that this statement is executed as a regular text.



Lab01 Assignment

We will do the same for the next cell to display our personal information (Your full name and blazerid)

```
Mahmut Unan  
BlazerID: unan
```

Finally, we will be executing a Python Script (code). Third cell should be in the “Code” format. Type the following command:

```
print('Hello World!')
```

When you hit the “Run” button, you will see that it printed your message to the notebook.(do not copy paste the print command, type it instead)

We can use the python shell to the simple calculations here. Try this;
in a new “Code” cell, create some basic calculations and hit Run button

This will be the final version of your notebook

Lab01 Assignment

Mahmut Unan BlazerID: unan

```
In [1]: print("Hello World!")
```

Hello World!

```
In [2]: 5+10
```

Out[2]: 15

```
In [4]: 3*44
```

Out[4]: 132

Submit your assignment:

The Jupyter notebook is autosaved, so you don’t have to worry about saving your work. You can find your **lab01.ipynb** file (under your cs103fa25/lab01 folder) and upload it to the Canvas. Now you are ready to start working on hw1.ipynb file.

Pep talk: there are a lot of steps to install our working environment here at the beginning of the course, but after that, we will probably not have any other software installations for the rest of the course. These installations are a bit tedious, but part of your training as a computer scientist. Fortunately, writing code will be far more enjoyable.