The National School of
Artificial Intelligence
المدرسة الوطنية العليا للذكاء الاصطناعي

Introduction to Artificial Intelligence

Lab 1(week 1) -Introduction to Python Programming
2023 - 2024

04 February 2024

Objectives

- Setting Up Python Environment Install Python and a package manager (e.g., Anaconda).
- Introduction to Jupyter Notebooks.
- Install Spyder.
- Basic Python Programming Variables, data types, and operators. Control structures (if statements, loops).

Part 1: Environment Preparation

1. Setting Up Python Environment Install Python and a package manager Anaconda:

Step 1: Install Anaconda:

- Visit the https://www.anaconda.com/ and download the latest version of Anaconda suitable for your operating system (Windows, macOS, or Linux).
- Follow the installation instructions provided on the website. During installation, you can choose to add Anaconda to your system's PATH, which makes it easier to use from the command line.

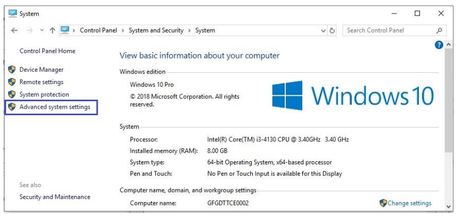
Step 2: Check the installation:

Open a command prompt or terminal window. To check if Anaconda is installed, type the following command:

```
conda --version
```

This command should display the version of conda, the package manager that comes with Anaconda. If 'conda' is not recognized as a command, you need to add it to the global PATH on your system by following these steps:

For windows:


System

Control Panel › System and Security › System

View basic information about your computer

Windows edition

Windows 10 Pro

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System

Processor: Intel(R) Core(TM) i3-4130 CPU @ 3.40GHz 3.40 GHz

Installed memory (RAM): 8.00 GB

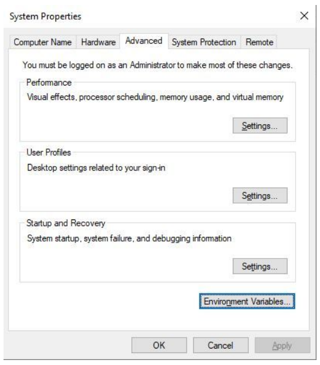
System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

Computer name: GFGDTTCE0002

Figure 1: (Step 1)


System Properties

You must be logged on as an Administrator to make most of these changes.

Performance

Visual effects, processor scheduling, memory usage, and virtual memory

User Profiles

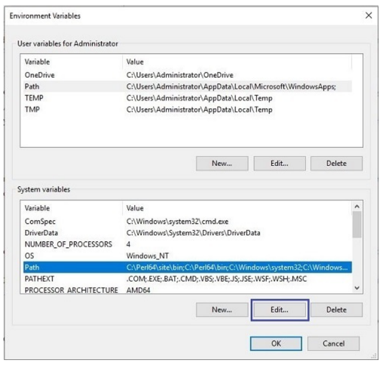
Desktop settings related to your sign-in

Startup and Recovery

System startup, system failure, and debugging information

Figure 2: (Step 2)

We need to modify the "Path" variable within the System variables to include the path to the Anaconda environment. Choose the "Path" variable and click on the Edit button, as illustrated below:


Environment Variables

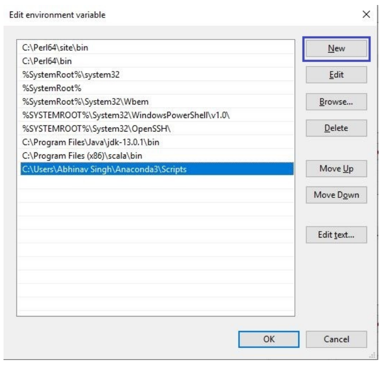
User variables for Administrator

Variable	Value
OneDrive	C:\Users\Administrator\OneDrive
Path	C:\Users\Administrator\AppData\Local\Microsoft\WindowsApps;
TEMP	C:\Users\Administrator\AppData\Local\Temp
TMP	C:\Users\Administrator\AppData\Local\Temp

System variables

Variable	Value
ComSpec	C:\Windows\system32\cmd.exe
DriverData	C:\Windows\System32\Drivers\DriverData
NUMBER_OF_PROCESSORS	4
OS	Windows_NT
Path	C:\Perl64\site\bin;C:\Perl64\bin;C:\Windows\system32;C:\Windows...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
PROCESSOR_ARCHITECTURE	AMD64

Upon doing so, a list of various paths will be displayed. Click on the "New" button, then proceed to add the path where Anaconda is installed.


Edit environment variable

```
C:\Perl64\site\bin
C:\Perl64\bin
%SystemRoot%\system32
%SystemRoot%
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
%SYSTEMROOT%\System32\OpenSSH\
C:\Program Files\Java\jdk-13.0.1\bin
C:\Program Files (x86)\scala\bin
C:\Users\Abhinav Singh\Anaconda3\Scripts
```

Click on OK, save the settings, and the process is complete! To verify the installation's accuracy, open the command prompt and enter "anaconda-navigator." If installed correctly, this will launch the Anaconda Navigator app.

For Linux:

There are multiple methods for installing Anaconda, but we will focus on the most straightforward approach, which involves installing Anaconda using the terminal.

Follow the steps outlined in the instructions on how to install Anaconda on Linux. Typically, the Path variable is configured automatically during the installation process on Linux. However, if needed, it can also be manually set by following these steps:

Step 1: Go to Application − > Accessories − > Terminal
To configure the Environment Variable, type the following commands in the Terminal, utilizing the installation path:

```
% export ANACONDA = /home/....path to anaconda/anaconda3
%export PATH = $PATH:/home/....path to anaconda/anaconda3/bin
%export PATH = $PATH:/home/....path to anaconda/anaconda3/Scripts
```

The process is now complete! To verify the installation's success, open the Terminal and type "`anaconda-navigator.`" If installed correctly, this will launch the Anaconda Navigator application.

Step 3: Create and Activate a Virtual Environment

Different projects may have different dependencies and versions. Isolating these dependencies is crucial, it helps avoid conflicts and ensures that each project has access to the specific packages it needs without interfering with others.

When using Anaconda specifically, the process of creating and activating a virtual environment involves using the conda package manager. The following are common commands:

```
conda create --name myenv
```

where "*myenv*" reflects the name of your virtual environment. To activate the virtual environment, you can use the following command:

```
conda activate myenv
```

To deactivate it, you simply use:

```
conda deactivate
```

To check for existing Virtual environments:

```
conda info --envs
```

Step 4: Install Additional Packages:

Once the virtual environment is activated, you can install additional packages using the `conda install` command. For example, to install popular data science libraries, you can use:

```
conda install numpy pandas matplotlib seaborn jupyter
```

This command installs NumPy, Pandas, Matplotlib, Seaborn, and Jupyter Notebook in your virtual environment.

2. Introduction to Jupyter Notebook:

Jupyter Notebooks are a popular, open-source tool that allows you to create and share live code, equations, visualizations, and narrative text. They are widely used in data science, machine learning, research, and education. Jupyter Notebooks support multiple programming languages, but they are most commonly used with Python.

Step 1. Opening a Notebook:

- After installing Jupyter Notebook through Anaconda, you can open it by typing ‘jupyter notebook‘ in the command line. This will launch the Jupyter Notebook server, and you can access the interface through your web browser.

Step 2. Creating a New Notebook:

- In the Jupyter Notebook interface, click on ”New” and choose a kernel (e.g., Python 3) to create a new notebook.

Step 3. Working with Cells:

- Jupyter Notebook consists of cells, which can be of two main types: code cells and markdown cells. You can switch between them using the drop-down menu in the toolbar.
- These cells are used for writing and executing code. Python is the default kernel, but you can choose other languages.

Step 4. Executing Code:

- To execute a code cell, select it and press `Shift + Enter` or click the ”Run” button in the toolbar. The output will be displayed below the cell.

Step 5. Markdown Cells:

- Use markdown cells for adding formatted text, headers, lists, and equations. You can render the markdown by executing the cell.

Step 6. Saving and Exporting:

- Save your work using the ”Save” button or `Ctrl + S` (Windows/Linux) or `Command + S` (Mac). You can also export the notebook in various formats, such as HTML, PDF, or as a script.

Note:

`Google Colab` is essentially a Jupyter Notebook environment hosted on Google’s servers. This means you can write, run, and share Jupyter notebooks directly in your web browser without the need for any local installation.