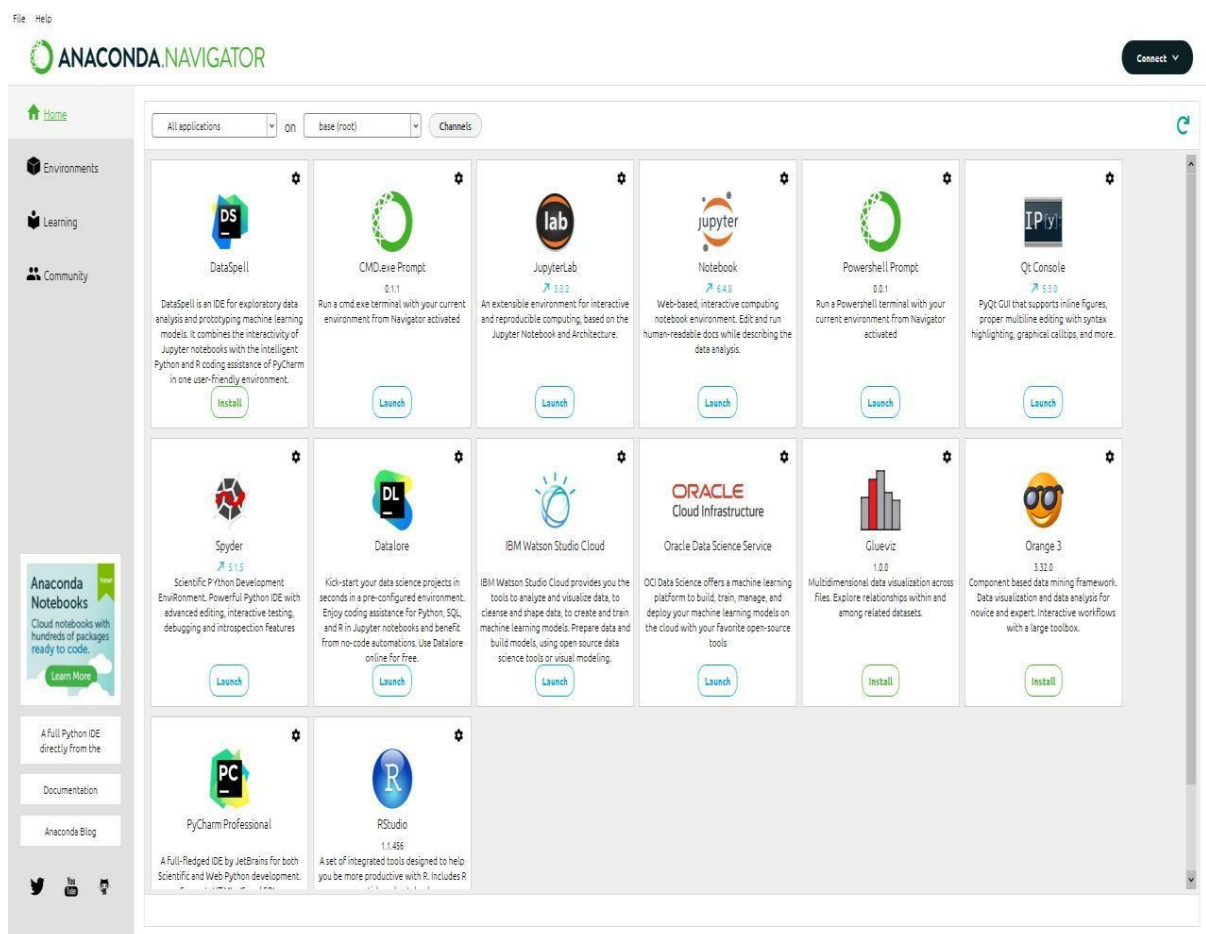


# Prerequisites

<b>Team ID</b>	<b>PNT2022TMID32324</b>
<b>Project Name</b>	<b>A novel method for handwritten digit recognition system.</b>

Anaconda Navigator and all the packages required are installed by all the team members. Software requirements are satisfied.

## Anaconda Navigator Installation



Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning related applications. It can be installed on Windows, Linux, and macOS. Conda is an open-source, cross-platform, package management system. Anaconda comes with so very nice tools like JupyterLab, Jupyter Notebook, QtConsole, Spyder, Glueviz, Orange, Rstudio, Visual Studio Code. For this project, we will be using Jupiter notebook and spyder.

## Packages Installation

```
Anaconda Prompt (Anaconda3) - python
(base) C:\Users\acer>pip install numpy
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: numpy in c:\programdata\anaconda3\lib\site-packages (1.21.5)

(base) C:\Users\acer>pip install pandas
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: pandas in c:\programdata\anaconda3\lib\site-packages (1.4.2)
Requirement already satisfied: python-dateutil<2.8.1 in c:\programdata\anaconda3\lib\site-packages (from pandas) (2.8.2)
Requirement already satisfied: numpy>=1.18.5 in c:\programdata\anaconda3\lib\site-packages (from pandas) (1.21.5)
Requirement already satisfied: pytz>=2020.1 in c:\programdata\anaconda3\lib\site-packages (from pandas) (2021.3)
Requirement already satisfied: six>=1.5 in c:\programdata\anaconda3\lib\site-packages (from python-dateutil<2.8.1->pandas) (1.16.0)

(base) C:\Users\acer>pip install matplotlib
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: matplotlib in c:\programdata\anaconda3\lib\site-packages (3.5.1)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (1.3.2)
Requirement already satisfied: numpy>=1.17 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (1.21.5)
Requirement already satisfied: pyparsing>=2.2.1 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (3.0.4)
Requirement already satisfied: packaging>=20.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (21.3)
Requirement already satisfied: fonttools>=4.22.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (4.25.0)
Requirement already satisfied: cycler>=0.10 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (0.11.0)
Requirement already satisfied: pillow>=6.2.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (9.0.1)
Requirement already satisfied: python-dateutil<2.7 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (2.8.2)
Requirement already satisfied: six>=1.5 in c:\programdata\anaconda3\lib\site-packages (from python-dateutil<2.7->matplotlib) (1.16.0)

(base) C:\Users\acer>pip install seaborn
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: seaborn in c:\programdata\anaconda3\lib\site-packages (0.11.2)
Requirement already satisfied: numpy>=1.15 in c:\programdata\anaconda3\lib\site-packages (from seaborn) (1.21.5)
Requirement already satisfied: scipy>=1.0 in c:\programdata\anaconda3\lib\site-packages (from seaborn) (1.7.3)
Requirement already satisfied: pandas>=0.23 in c:\programdata\anaconda3\lib\site-packages (from seaborn) (1.4.2)
Requirement already satisfied: matplotlib>=2.2 in c:\programdata\anaconda3\lib\site-packages (from seaborn) (3.5.1)
Requirement already satisfied: cycler>=0.10 in c:\programdata\anaconda3\lib\site-packages (from matplotlib>=2.2->seaborn) (0.11.0)
Requirement already satisfied: pillow>=6.2.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib>=2.2->seaborn) (9.0.1)
Requirement already satisfied: pyparsing>=2.2.1 in c:\programdata\anaconda3\lib\site-packages (from matplotlib>=2.2->seaborn) (3.0.4)
Requirement already satisfied: packaging>=20.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib>=2.2->seaborn) (21.3)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\programdata\anaconda3\lib\site-packages (from matplotlib>=2.2->seaborn) (1.3.2)
Requirement already satisfied: fonttools>=4.22.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib>=2.2->seaborn) (4.25.0)
Requirement already satisfied: python-dateutil>=2.7 in c:\programdata\anaconda3\lib\site-packages (from matplotlib>=2.2->seaborn) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in c:\programdata\anaconda3\lib\site-packages (from pandas>=0.23->seaborn) (2021.3)
Requirement already satisfied: six>=1.5 in c:\programdata\anaconda3\lib\site-packages (from python-dateutil>=2.7->matplotlib>=2.2->seaborn) (1.16.0)

(base) C:\Users\acer>python
Python 3.9.12 (main, Apr 4 2022, 05:22:27) [MSC v.1916 64 bit (AMD64)] :: Anaconda, Inc. on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> import pandas
>>> import numpy
>>> import matplotlib
>>> import seaborn
```

### Packages installed are:

- |               |               |
|---------------|---------------|
| 1. Pandas     | 5. Tensorflow |
| 2. Numpy      | 6. Keras      |
| 3. Matplotlib | 7. Opencv     |
| 4. Seaborn    | 8. Flask      |

```
Anaconda Prompt (Anaconda3)

(base) C:\Users\acer>python
Python 3.9.12 (main, Apr  4 2022, 05:22:27) [MSC v.1916 64 bit (AMD64)] :: Anaconda, Inc. on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> import numpy
>>> import pandas
>>> import matplotlib
>>> import seaborn
>>> import tensorflow as tf
2022-11-03 00:11:13.502140: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'cudart64_110.dll'; dlerror: cudart64_110.dll not found
2022-11-03 00:11:13.502243: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.
>>> import tensorflow
>>> import keras
>>> import cv2
>>> import flask
>>> quit()

(base) C:\Users\acer>
```

## Jupyter Notebook

The screenshot shows a Jupyter Notebook interface in a web browser. The browser address bar shows the URL `localhost:8888/tree/Desktop/python%203`. The Jupyter interface has a top bar with the Jupyter logo, a "Quit" button, and a "Logout" button. Below the top bar, there are tabs for "Files", "Running", and "Clusters". The "Files" tab is active, showing a file browser view of the `Desktop / python 3` directory. The file browser shows a list of files and folders, including `..`, `ass.ipynb`, `assignment 2.ipynb`, `simple programs.ipynb`, `ass.ipynb`, `ass2.ipynb`, `assignment 2.ipynb`, `assignment 3.ipynb`, `assignment 4-Copy1.ipynb`, `assignment 4.ipynb`, `assignment2-Copy1.ipynb`, `assignment2.ipynb`, `data collection.ipynb`, `data preprocessing.ipynb`, `Untitled.ipynb`, `Untitled1.ipynb`, `Untitled2.ipynb`, `Untitled3.ipynb`, and `Untitled4.ipynb`. The files are listed with their names, last modified times, and file sizes.

Name	Last Modified	File size
..	seconds ago	
ass.ipynb	a month ago	2.33 MB
assignment 2.ipynb	a month ago	2.12 MB
simple programs.ipynb	a month ago	195 kB
ass.ipynb	a month ago	2.12 MB
ass2.ipynb	a month ago	2.22 MB
assignment 2.ipynb	a month ago	2.2 MB
assignment 3.ipynb	a day ago	50.1 kB
assignment 4-Copy1.ipynb	4 days ago	16.4 kB
assignment 4.ipynb	4 days ago	16.5 kB
assignment2-Copy1.ipynb	a month ago	2.17 MB
assignment2.ipynb	a month ago	2.22 MB
data collection.ipynb	4 days ago	18.3 kB
data preprocessing.ipynb	a day ago	59.7 kB
Untitled.ipynb	a month ago	2.12 MB
Untitled1.ipynb	a month ago	50.3 kB
Untitled2.ipynb	4 days ago	2.5 kB
Untitled3.ipynb	4 days ago	16.8 kB
Untitled4.ipynb	4 days ago	15.8 kB