

Prerequisites

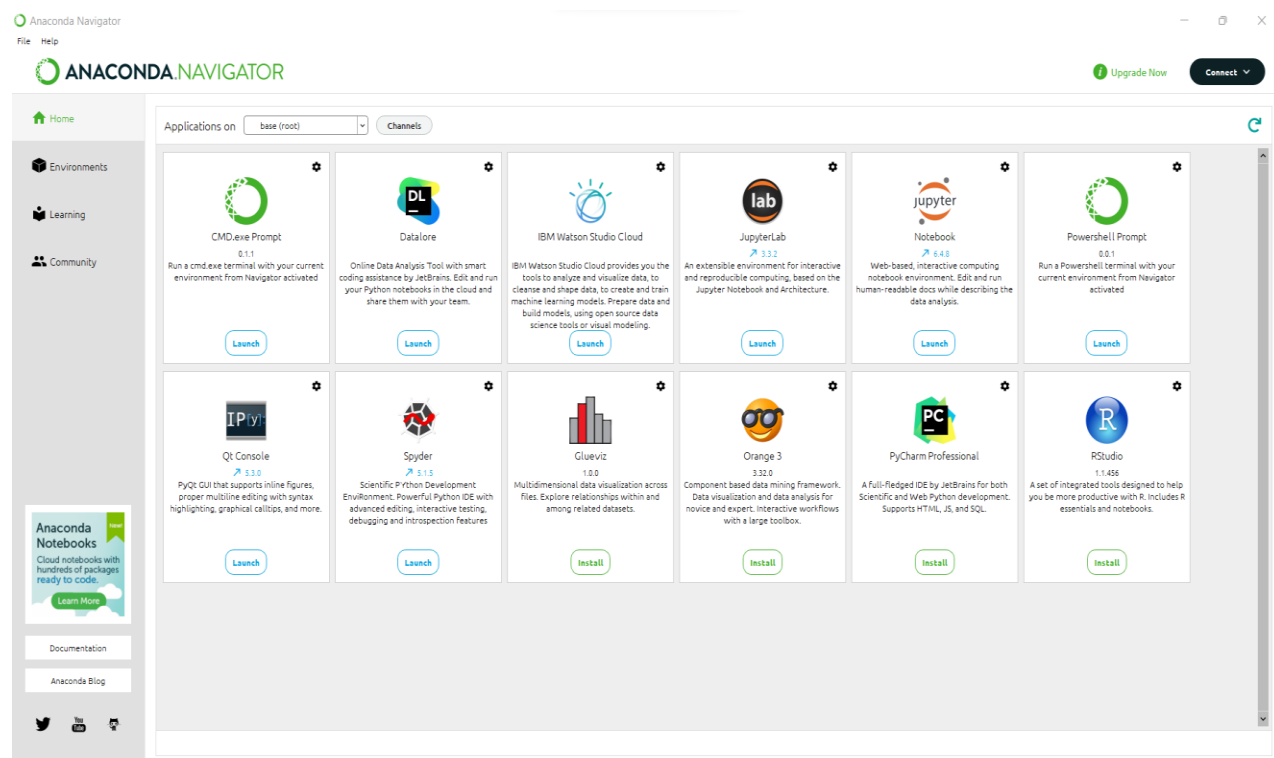
Team ID	PNT2022TMID18280
Project Name	A Novel Method for Handwritten Digit Recognition

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

Anaconda Navigator:

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 Jupyter notebook and spyder

Anaconda Navigator Installation:



Packages Installation :

```
Anaconda Prompt (anaconda3)

(base) C:\Users\ DELL>pip install tensorflow
Collecting tensorflow
  Downloading tensorflow-2.10.1-cp39-win_ amd64.whl (455.9 MB)
    Requirement already satisfied: numpy>=1.20 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (1.21.5)
    Requirement already satisfied: protobuf<3.20,>=3.9.2 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (3.19.1)
    Requirement already satisfied: six>=1.12.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (1.16.0)
    Collecting tensorflow-io-gcs-filesystem<=0.22.1
      Using cached tensorflow_io_gcs_filesystem-0.27.0-cp39-win_ amd64.whl (1.5 MB)
    Requirement already satisfied: packaging in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (21.3)
    Collecting termcolor>=1.1.0
      Using cached termcolor-2.1.0-py3-none-any.whl (5.8 kB)
    Collecting keras<2.11,>=2.10.0
      Using cached keras-2.10.0-py2.py3-none-any.whl (1.7 MB)
    Requirement already satisfied: wrapt>=1.11.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (1.12.1)
    Collecting keras-preprocessing>=1.1.1
      Using cached Keras_Preprocessing-1.1.2-py3-none-any.whl (42 kB)
    Collecting libclang>=13.0.0
      Using cached libclang-14.0.6-py2.py3-none-win_ amd64.whl (14.2 MB)
    Requirement already satisfied: grpcio<2.0,>=1.24.3 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (1.42.0)
    Collecting tensorflow2.11,>=2.10.0
      Using cached tensorflow-2.10.1-py3-none-any.whl (5.9 MB)
    Requirement already satisfied: typing-extensions>=3.6.6 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (4.1.1)
    Collecting absl-py>=1.0.0
      Using cached absl_py-1.3.0-py3-none-any.whl (124 kB)
    Collecting tensorflow-estimator<2.11,>=2.10.0
      Using cached tensorflow_estimator-2.10.0-py2.py3-none-any.whl (438 kB)
    Collecting google-pasta>=0.1.1
      Using cached google_pasta-0.2.0-py3-none-any.whl (57 kB)
    Requirement already satisfied: setuptools in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (61.2.0)
    Requirement already satisfied: h5py>=2.9.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow) (3.6.0)
    Collecting astunparse>=1.6.0
      Using cached astunparse-1.6.3-py2.py3-none-any.whl (12 kB)
    Collecting gast<0.4.0,>=0.2.1
      Using cached gast-0.4.0-py3-none-any.whl (9.8 kB)
    Collecting flatbuffers>=2.0
      Using cached flatbuffers-22.10.26-py2.py3-none-any.whl (26 kB)
    Collecting opt-einsum>=2.3.2
      Using cached opt_einsum-3.3.0-py3-none-any.whl (65 kB)
    Requirement already satisfied: wheel<1.0,>=0.23.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from astunparse>=1.6.0->tensorflow) (0.37.1)
    Requirement already satisfied: requests<3,>=2.21.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow2.11,>=2.10->tensorflow) (2.27.1)
    Requirement already satisfied: markdown>=2.6.8 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow2.11,>=2.10->tensorflow) (3.3.4)
    Collecting tensorflow-data-server<0.7.0,>=0.6.0
      Using cached tensorflow_data_server-0.6.1-py3-none-any.whl (2.4 kB)
    Collecting tensorflow-plugin-wit<=1.6.0
      Using cached tensorflow_plugin_wit-1.8.1-py3-none-any.whl (781 kB)
    Collecting google-auth-oauthlib<0.5,>=0.4.1
      Using cached google_auth_oauthlib-0.4.6-py2.py3-none-any.whl (18 kB)

Anaconda Prompt (anaconda3)

    Using cached google_auth_oauthlib-0.4.6-py2.py3-none-any.whl (18 kB)
    Requirement already satisfied: werkzeug>=1.0.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow2.11,>=2.10->tensorflow) (2.0.3)
    Requirement already satisfied: google-auth<3,>=1.6.3 in c:\users\ dell\ anaconda3\ lib\ site-packages (from tensorflow2.11,>=2.10->tensorflow) (1.33.0)
    Requirement already satisfied: pyasn1-modules<0.2.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from google-auth<3,>=1.6.3->tensorflow2.11,>=2.10->tensorflow) (0.2.8)
    Requirement already satisfied: cachetools<5.0,>=2.0.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from google-auth<3,>=1.6.3->tensorflow2.11,>=2.10->tensorflow) (4.2.2)
    Requirement already satisfied: rsa<5,>=1.4 in c:\users\ dell\ anaconda3\ lib\ site-packages (from google-auth<3,>=1.6.3->tensorflow2.11,>=2.10->tensorflow) (4.7.2)
    Collecting requests-oauthlib>=7.0
      Using cached requests_oauthlib-1.3.1-py2.py3-none-any.whl (23 kB)
    Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in c:\users\ dell\ anaconda3\ lib\ site-packages (from pyasn1-modules>=0.2.1->google-auth<3,>=1.6.3->tensorflow2.11,>=2.10->tensorflow) (0.4.8)
    Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from requests<3,>=2.21.0->tensorflow2.11,>=2.10->tensorflow) (1.26.9)
    Requirement already satisfied: charset-normalizer<=2.0.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from requests<3,>=2.21.0->tensorflow2.11,>=2.10->tensorflow) (2.0.4)
    Requirement already satisfied: certifi>=2017.4.17 in c:\users\ dell\ anaconda3\ lib\ site-packages (from requests<3,>=2.21.0->tensorflow2.11,>=2.10->tensorflow) (2021.10.8)
    Requirement already satisfied: idna<3,>=2.5 in c:\users\ dell\ anaconda3\ lib\ site-packages (from requests<3,>=2.21.0->tensorflow2.11,>=2.10->tensorflow) (3.3)
    Collecting oauthlib<=3.0
      Using cached oauthlib-3.2.2-py3-none-any.whl (151 kB)
    Requirement already satisfied: pyrsn1p1<3.0.5,>=2.0.2 in c:\users\ dell\ anaconda3\ lib\ site-packages (from packaging>tensorflow) (3.0.4)
    Installing collected packages: oauthlib, requests-oauthlib, tensorflow-data-server, google-auth-oauthlib, absl-py, termcolor, tensorflow-io-gcs-filesystem, tensorflow-estimator, tensorflow, opt-einsum, libclang, keras-preprocessing, keras, google-pasta, gast, flatbuffers, astunparse, tensorflow
    Attempting uninstall: keras
      Found existing installation: keras 2.11.0
      Uninstalling keras-2.11.0:
        Successfully uninstalled keras-2.11.0
    Successfully installed absl-py-1.3.0 astunparse-1.6.3 flatbuffers-22.10.26 gast-0.4.0 google-auth-oauthlib-0.4.6 google-pasta-0.2.0 keras-2.10.0 keras-preprocessing-1.1.2 libclang-14.0.6 oauthlib-3.2.2 opt-einsum-3.3.0 requests-oauthlib-1.3.1 tensorflow-data-server-0.6.1 tensorflow-plugin-wit-1.8.1 tensorflow-2.10.1 tensorflow-estimator-2.10.0 tensorflow-io-gcs-filesystem-0.27.0 termcolor-2.1.0

(base) C:\Users\ DELL>pip install numpy
Requirement already satisfied: numpy in c:\users\ dell\ anaconda3\ lib\ site-packages (1.21.5)

(base) C:\Users\ DELL>pip install pandas
Requirement already satisfied: pandas in c:\users\ dell\ anaconda3\ lib\ site-packages (1.4.2)
Requirement already satisfied: numpy>=1.18.5 in c:\users\ dell\ anaconda3\ lib\ site-packages (from pandas) (1.21.5)
Requirement already satisfied: pytz>=2020.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from pandas) (2021.3)
Requirement already satisfied: python-dateutil>=2.8.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from pandas) (2.8.2)
Requirement already satisfied: six>=1.5 in c:\users\ dell\ anaconda3\ lib\ site-packages (from python-dateutil>=2.8.1->pandas) (1.16.0)

(base) C:\Users\ DELL>pip install matplotlib
Requirement already satisfied: matplotlib in c:\users\ dell\ anaconda3\ lib\ site-packages (3.5.1)
Requirement already satisfied: pillow>=6.2.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (9.0.1)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (2.8.2)
Requirement already satisfied: cycler>=0.10 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (0.11.0)
Requirement already satisfied: numpy>=1.17 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (1.21.5)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (1.3.2)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (4.25.0)
Requirement already satisfied: packaging>=20.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (21.3)
Requirement already satisfied: pyrsn1p1>=2.2.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib) (3.0.4)
Requirement already satisfied: six>=1.5 in c:\users\ dell\ anaconda3\ lib\ site-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)

(base) C:\Users\ DELL>pip install seaborn
Requirement already satisfied: seaborn in c:\users\ dell\ anaconda3\ lib\ site-packages (0.11.2)

Anaconda Prompt (anaconda3)

(base) C:\Users\ DELL>pip install seaborn
Requirement already satisfied: seaborn in c:\users\ dell\ anaconda3\ lib\ site-packages (0.11.2)
Requirement already satisfied: matplotlib>=2.2 in c:\users\ dell\ anaconda3\ lib\ site-packages (from seaborn) (3.5.1)
Requirement already satisfied: scipy>=1.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from seaborn) (1.7.3)
Requirement already satisfied: numpy>=1.15 in c:\users\ dell\ anaconda3\ lib\ site-packages (from seaborn) (1.21.5)
Requirement already satisfied: pandas>=0.23 in c:\users\ dell\ anaconda3\ lib\ site-packages (from seaborn) (1.4.2)
Requirement already satisfied: cycler>=0.10 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib>=2.2->seaborn) (0.11.0)
Requirement already satisfied: packaging>=20.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib>=2.2->seaborn) (21.3)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib>=2.2->seaborn) (4.25.0)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib>=2.2->seaborn) (1.3.2)
Requirement already satisfied: pillow>=6.2.0 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib>=2.2->seaborn) (9.0.1)
Requirement already satisfied: pyrsn1p1>=2.2.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib>=2.2->seaborn) (3.0.4)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\ dell\ anaconda3\ lib\ site-packages (from matplotlib>=2.2->seaborn) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in c:\users\ dell\ anaconda3\ lib\ site-packages (from pandas>=0.23->seaborn) (2021.3)
Requirement already satisfied: six>=1.5 in c:\users\ dell\ anaconda3\ lib\ site-packages (from python-dateutil>=2.7->matplotlib>=2.2->seaborn) (1.16.0)

(base) C:\Users\ DELL>pip install opencv-python
Requirement already satisfied: opencv-python in c:\users\ dell\ anaconda3\ lib\ site-packages (4.6.0.66)
Requirement already satisfied: numpy>=1.14.5 in c:\users\ dell\ anaconda3\ lib\ site-packages (from opencv-python) (1.21.5)

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

Packages installed are:

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

Jupyter Notebook :

The screenshot shows the Jupyter Notebook file browser interface. At the top, there is a header with the Jupyter logo and the word "jupyter". To the right of the header are buttons for "Quit" and "Logout". Below the header, there are tabs for "Files", "Running", and "Clusters". The "Files" tab is selected. Below the tabs, there is a prompt "Select items to perform actions on them." and buttons for "Upload", "New", and a refresh icon. Below this, there is a table listing files and folders. The table has columns for "Name", "Last Modified", and "File size". The files listed are:

Name	Last Modified	File size
3D Objects	2 years ago	
anaconda3	14 days ago	
ansel	2 years ago	
Cisco Packet Tracer 7.2.1	a year ago	
Cisco Packet Tracer 8.0.1	2 months ago	
Contacts	9 months ago	
Documents	23 days ago	
Downloads	22 minutes ago	
Favorites	9 months ago	
Links	9 months ago	
Music	a month ago	
New folder	2 years ago	
OneDrive	8 hours ago	
Saved Games	9 months ago	
seaborn-data	a year ago	
Searches	9 months ago	
Videos	9 months ago	
BullseyeCoverageError.txt	a year ago	151 B