Group 4 Readme:

Our project implementation includes four different models. In this ReadMe file, you will find the requirements and instructions to run all the four models.

Hardware and Software Prerequisites:

Language to be used : Python, MATLAB
Environment : PyCharm and Anaconda, Jupyter Notebook, MATLAB

Libraries to be Used :
- Pandas - Data Pre-processing
- Numpy - Mathematical tools
- Matplotlib - Plotting Maps
- Keras - Deep Learning Models
- SkLearn - Machine Learning Algorithms
- Itertools - Data Structures
- cv2 - Image Processing
- Fastai
- PyTorch

Steps to run the project:

- **Implementation 1 (Transfer Learning):**

1. Open the given Jupyter Notebook in Google Colab.
2. Upload a copy of the dataset in your Google Drive.
3. Make sure all the libraries are imported.
4. Run the training process and wait for all the epochs to be completed.
5. Now run the testing part and get the desired results.

- **Implementation 2 (ResNet50):**

1. Open the given Jupyter Notebook in Google Colab.
2. Link the COVID Radiography Dataset from Kaggle to your Colab.
3. Make sure all the libraries are imported.
4. Run the training process and wait for all the epochs to be completed.
5. Now run the testing part and get the desired results.

- **Implementation 3 (DarkCovidNet):**

1. Open the given Jupyter Notebook in Google Colab.
2. Upload a copy of the dataset in your Google Drive.
3. Make sure all the libraries are imported.
4. Run the training process and wait for all the epochs to be completed.
5. Now run the testing part and get the desired results.

- **Implementation 4 (STM-RENet):**

1. Open MATLAB.
2. Set MATLAB folder location same as the project folder.
3. Now add each folder to the MATLAB path from the Current Folder panel by right clicking on each folder and selecting Add to Path > Selected Folder and Subfolders.
4. Now you can run either test models individually or run MATLAB GUI App as described below.
5. Directory: classification-test-code
6. test_code_image.m: Use this file for testing classification models on a folder of images at once.
7. Inside this directory there is a gui_classification.mlapp file. In order to use MATLAB-GUI-app type following at command window.
   >> gui_classification
8. Now the GUI interface will open after some time, then it will allow us to load the image, and classify it as COVID-19 or Non-COVID-19.