1. **Installation of libraries needed for project:**

   Required list libraries are given in "src" folder as "requirements.txt" and "test_environment.yml".
   Any one of the two files can be used to replicate environment needed to run the project.

2. **Instruction to run the training code**

   There are 4 models:
   All the code related to each model is kept in "src" folder. There are are four sub folders namely
   "model1", "model2", "model3", "model4".

   "model1" has python file name trail2.ipynb
   "model2" has python file name trail3.ipynb
   "model3" has python file name trail4.ipynb
   "model4" has python file name trail5.ipynb

   Each of the file mentioned above should be opened in jupyter notebook and all cells should be run in
   sequential manner. Trained weights is saved as checkpoints in folder named "checkpoints" -> "train"

3. **Instruction to run the Evaluation code**

   There are 4 models:
   - All the code related to each model is kept in "src" folder. There are are four sub folders namely
     "model1", "model2", "model3", "model4".
   - Each of the folder has file named "Evaluation.ipynb", run this file in jupyter notebook to test the
     trained model, visualize results and generate Absolute mean squared error(Cycled loss)evaluation
     metrics.
   - Each "Evaluation.ipynb" code in respective folders of models load the trained checkpoints from
     respective folders named "checkpoints" -> "best". In the "best" folder only checkpoints lowest total
     loss in kept.
   - In "src" folder there is a python program file named "ssim.ipynb", run all cells sequentially to generate
     Structural similarity index(SSIM) scores for each model.
   - Model 1 weights(checkpoints) are stored in folder "src"->"model1"->"checkpoints"->"best"
   - Model 2 weights(checkpoints) are stored in folder "src"->"model2"->"checkpoints"->"best"
   - Model 3 weights(checkpoints) are stored in folder "src"->"model3"->"checkpoints"->"best"
   - Model 4 weights(checkpoints) are stored in folder "src"->"model4"->"checkpoints"->"best"
   - Please changes paths of weights file to above paths when running respective "Evaluation.ipynb" of
     models.

4. **Dataset**

   File name "dataset_download.ipynb" is kept in "src" folder. This python program was used to
   download the data set from TensorFlow website
   "https://www.tensorflow.org/datasets/catalog/cycle_gan"

   Data set is kept in folder named "data". It has four sub folders namely train_horses, train_zebras,
   test_horses, test_zebras.

5. **Generators and Discriminators code:**

   There are 4 models:
   All the code related to each model is kept in "src" folder. There are are four sub folders namely "model1", "model2", "model3", "model4". In each sub folders there is a python program files named "custom.py" in which code for different types of generators and discriminators are coded.

6. **Important note:**

   Only for Model 1, we have used Descriminator as it is without changes for just testing as how the model get's trained with custom built Generator code, the Descriminator code was used from "https://www.tensorflow.org/tutorials/generative/pix2pix".

7. **Code contribution:**

   All code related to folders namely "model1", "model2", "model3", "model4", "ssim.ipynb" and dataset_download.ipynb is contributed by Naveen Raju Govinda Raju Sreerama Raju.

8. **Results**

In folder named "data". There are are four sub folders namely "model1", "model2", "model3", "model4". In each of these folders there are two folders namely: "horse_cycledhorse" and "zebra_cycledzebra".

"horse_cycledhorse": contains stacked images of real horse, generated zebra and cycled horse
"zebra_cycledzebra": contains stacked images of real zebra, generated horse and cycled zebra