1. **Installing the libraries needed for the Project:**
   We trained this project in Google Colab and have included the necessary libraries which have used. Use “requirements.txt” file to install the required libraries which is located in “src” folder.

2. **Running the Code:**
   a. First We need to preprocess the image, for that we need to run the preprocessing.ipynb file. This will automatically resize and create a pickle file containing FFHQ data which will be used in our project. Change that directory file and run the code it will automatically generate the pickle file in the specified folder.
   b. We defined 3 models for the project and they were stored in the “src” directory. And this folder contains:
      i. Simple_GAN.ipynb: Simple GAN model
      ii. U-Net_GAN.ipynb: U-Net Based GAN model
      iii. U-Net_CutMix_GAN: U-Net GAN model with CutMix Augumentation

      Each of the model takes the pickle file generated and stored in the data folder and runs the program.

   c. Use the .h5 files which are trained on the dataset. These files are located in the same folder.
      i. Simple_GAN.ipynb will use “discriminator_model2.h5” and “generator_model2.h5”.
      ii. U-Net_GAN.ipynb will use “discriminator_model200.h5” and “generator_model200.h5”
      iii. U-Net_CutMix_GAN will use “discriminator_model_cut.h5” and “generator_model_cut.h5”

3. **Data:**
   Filename: “image_dump”. Pickle file containing 1000 images. To generate this, we downloaded the dataset from Kaggle and generated this pickle file. It was located in “data” folder.
   Dataset link: https://www.kaggle.com/datasets/rahulbhalley/ffhq-1024x1024
4. **Results:**
   There are few images with name of the model which shows the generated output after the end of the training. These images are downloaded from Google Drive and has been stored in the system’s local storage to perform evaluation. These can be found in “data/results” folder.
5. **Evaluation:**
   A image is selected from the real image dataset and its path is passed to real_image variable in “SSIM_FID.ipynb”.
   Generated images directory is pasted in generated_image_dir variable. This code evaluates SSIM and FID for all the images in the directory and gives the best generated image(output).
   The image we randomly selected as real_image variable is stored in data folder with the name “00001.png”

Note:

For some models, we followed the basic GAN architecture template which we studied in opensource repositories but we have modified to our own objective.