Assignment 1

Generate 10 Random Faces & Save Latent Vectors

Steps:

1. **Set up StyleGAN2-ADA environment**
   Ensure StyleGAN2-ADA repo and dependencies are installed (you may have done this already).

2. **Load Pre-trained FFHQ Weights**
   Use the official FFHQ model checkpoint for high-quality face generation.

3. **Sample 10 Random Latent Vectors in Z Space**
   Use `np.random.randn(512)` to generate random latent codes in the input latent space Z.

4. **Map Z to W Space**
   Pass latent codes through StyleGAN2's mapping network to get W vectors, or optionally use W+ by expanding to per-layer vectors.

5. **Generate Faces from Latent Vectors**
   Feed W or W+ vectors into the synthesis network to produce images.

6. **Save Latent Vectors and Images**
   Store latent vectors (Z, W, or W+) as `.npy` files and generated images as `.png` for further use

Assignment - 2

Real-Time Latent Editing Interface
Build an interactive UI to manipulate facial features in real-time using latent space controls.

Tasks:
Set up the GUI

Use Streamlit

Layout: 3 sliders (e.g., smile, age, gender) + buttons (random face, reset, save).

Connect sliders to latent directions

Load precomputed latent directions (e.g., from InterFaceGAN or GANSpace).

Apply additive modifications to base latent vectors and regenerate images.

Implement real-time feedback

Assignment - 3

Final Features, Style Mixing, and Demo

Objective:
Add advanced features, polish the user experience, and prepare the final demonstration of your Morphix tool.

Tasks:

- Implement Advanced Features
- Style Mixing: Mix latent vectors from two faces (you choose whether at W or W+).
- Preset Transformations: 5 predefined attribute edits (e.g., “glasses,” “beard,” “child face,” “cartoonized,” “artistic look”).
- Optional (if time permits): “Drag to modify” style edits (basic facial region control).
- Ensure <500ms response per edit using:
  1. Cached model loading
  2. Latent vector reuse
  3. Pre-downscaled images
- Add Undo/Redo functionality (simple stack-based logic).

PDF/slide deck summarizing:

- Architecture
- Latent space logic
- UI overview
- Sample results