Title: *Deep Generative Analysis of Ocular Health from Eye Images*

Team Members: Daniel Annang (22303917), Huraira Ali (22304705), Huzaifa Ahmed Farooq (22301346)

Overview:
This project aims to analyze images of human eyes to detect deviations from typical healthy eye structures, using deep generative models. The goal is to create a system that provides visual and diagnostic feedback based on learned representations of ocular health.

Objectives:

- Collect or use an existing dataset of human eye images (including healthy and unhealthy cases).
- Train a **variational autoencoder (VAE)** or **GAN** to model typical eye structures.
- Use **reconstruction error** or **latent features** to identify abnormalities.
- Visualize abnormal areas to provide intuitive health cues.
- Optionally, generate synthetic eye images to augment the dataset or assist in training.

Methodology:

- Preprocess and normalize eye images (iris/cornea-focused).
- Train a VAE or GAN on healthy eye images.
- Use the model to:
    - Detect and highlight irregularities (e.g., discoloration, asymmetry, anomalies).
    - Optionally, generate interpolations between healthy and abnormal eyes.
- Evaluate with classification accuracy (if labeled data available), reconstruction loss, and visual quality.

Deliverables:

- Code and trained model.
- Short demo video or live demo showing the scan and result.
- Final presentation slides and report detailing the architecture, experiments, and findings.