Project Title: Clue Restoration Game: An Interactive Learning Approach to Image Processing

Objectives:

- To design a game-like software that demonstrates core image processing techniques in an interactive way.
- To implement distortion (blur, noise, contrast loss) and restoration (sharpening, denoising, deblurring) operations using fundamental mathematical concepts.
- To provide a hands-on learning experience where players apply the correct filters to reveal hidden clues.
- To connect theoretical image processing concepts with practical applications through gamification.

Game Description:

The Clue Restoration Game is an educational software application that combines gaming elements with fundamental image processing concepts. Players take on the role of digital forensic experts who must restore corrupted, noisy, or distorted clue images using various image processing techniques.At the beginning of each round a distorted and noisy image of the clue will be given to the player. The player will be provided with a toolbox to apply necessary image processing techniques on the image to restore the original image and find out the clue. On finding out the clue the player will recieve points and moved to the next level.

Features:

- **Distorted Image Challenges:** Each round presents a blurred/noisy image with a hidden clue.
- **Restoration Toolbox:** Players can apply operations such as sharpening, histogram equalization, deblurring, and denoising.
- **Interactive Gameplay:** Step-by-step image restoration with instant visual feedback.
- **Scoring System:** Points awarded based on successful restoration and clue identification.
- **Multiple Rounds:** A set of different images and distortions for replayability.

Tools and Technologies:

- **Programming Language:** Python
- **Libraries:**
    - OpenCV – image processing (blur, filters, histogram equalization)
    - NumPy – mathematical operations and convolution
    - Tkinter / PyQt / Streamlit – graphical user interface
    - scikit-image – optional advanced restoration methods

Inputs:

A distorted image will be provided.

Outputs:

Processing needs to be done to retrive the actual image

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