Image to Pencil Sketch Converter:

A simple yet powerful Python application that uses the OpenCV library to convert any standard photographic image into a hand-drawn pencil sketch.

Features:

Grayscale Conversion: This reduces the image to intensity values which then act as the base for generating a sketch.
Gaussian blur: it gives a smooth shaded texture similar to pencil graphite.
Color Dodge Blending: This is the basic mathematical approach for amplifying the edges and highlights, giving the final result a sketch-like effect.
Sequential Display:A sequence showing the original, the grayscale, and the result of a sketch.

Requirements:

This program requires Python 3.x and the opencv-python library.

Installation:

Installation of Python: ensure that Python is installed on your system.
Installation of OpenCV: Open the Terminal or Command Prompt and execute the following command:
pip install opencv-python

How to Run:

Save the Code: Save the provided Python code with the name sketch_converter.py or any name that you like.

Place the Image: You can place any image you want to convert in the same folder as this Python script, for example, photo.jpg, portrait.png.

Update the Filename: In the Python file, update the following line with your own image file name:
image = cv2.imread("your_image_name.jpg") # Replace "your_image_name.jpg"

Execute Script: Run the program from your terminal:
python sketch_converter.py

Then, the program will open a series of windows, stopping for a short while after every step of conversion via cv2.waitKey(0), thus showing you the process from color to grayscale to the final sketch.

Overview of Code Logic:

Conversion is based on the following pipeline of digital image processing:

1. **Load Image:** Reads the input image.
2. **Grayscale Conversion:** It converts the color image to a monochrome intensity map.
3. **Invert Grayscale:** This makes a color negative of the grayscale image.
4. **Apply Gaussian Blur:** Smoothes the inverted image to get the shading depth.
5. **Invert Blurred Image:** Prepares the shading layer for the final blend.
6. **Color Dodge Blend:** Mathematically divides the original grayscale image by the inverted blurred image, yielding the characteristic high-contrast shaded pencil sketch.