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Color Detection Project

Overview
The Color Detection Project is designed to recognize and display color names from images or real-time video feeds based on their RGB (Red, Green, Blue) values. This project utilizes Python and computer vision techniques to analyze and interpret color compositions within various visual data sources.

Key Features
• Live Color Detection: Identifies colors in real time from a webcam or video feed.

• Static Image Analysis: Extracts color information from pre-existing or uploaded images.

• RGB Mapping: Associates detected RGB values with corresponding color names using a predefined dataset.

• User-Friendly Interface: Offers an interactive platform for selecting and analyzing colors efficiently.

Technologies Utilized
Programming Language: Python

Libraries:

- OpenCV (for processing images and video)

- NumPy (for mathematical operations)

- Pandas (for managing the color dataset)

Dataset: A CSV file that maps color names to their respective RGB values.

Project Structure

• color_detection.py – The main script that executes the color detection functionality.

• colors.csv – A dataset containing color names and their corresponding RGB values.

• images/ – A directory with sample images for testing.

• requirements.txt – A file listing all necessary dependencies.

Project Implementation

Static Image Color Detection

The following script detects colors from a static image using OpenCV and a color dataset.

```python
<Static Image Code Here>
```

Real-Time Color Detection

The following script detects colors in real time using a webcam.

```python
<Real-Time Color Code Here>
```

Example Outputs

Static Image Analysis

1. When a user uploads an image, the cursor detects the dominant colors in different areas.
2. Example output: If hovering over a gray area, the system might identify it as 'Gray,' displaying its Hex Code (#bababe) and RGB values (R=194, G=180, B=177).
3. If hovering over a red-tinted area, it might display 'Brick Red' with its corresponding Hex Code (#CB4154) and RGB values (R=199, G=67, B=78).

Real-Time Color Detection

1. The webcam feed dynamically detects and displays color names and RGB values based on the cursor position.
2. The output appears as text on the video feed, showing the detected color name, RGB values, and Hex Code in real time.