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**EXERCISE 1:**

Write a program which can read an image as an input and do the following automatically.

Show the results of all steps. 1.Find the type of image: binary, gray or RGB.

2.Find the issue in image, over dark, over bright, low contrast, or normal. (Hint: can use histogram).

3.Resolve the issue if any and show the final image after enhancement.

4.Test your program on following images

Function main()

% Test images (Replace these with actual file paths) testImages = {‘flower.jpeg’, ‘house.jpeg’, ‘nature.jpeg’};

% Process each image

For I = 1:length(testImages)

Fprintf(‘Processing: %s\n’, testImages{i}); processImage(testImages{i}); end

end

function processImage(filePath)

% Read the input image

Image = imread(filePath);

% Step 1: Detect the type of image imageType = detectImageType(image); fprintf(‘Image Type: %s\n’, imageType);

% Step 2: Analyze the image for issues

Issue = analyzeImageIssues(image);

Fprintf(‘Detected Issue: %s\n’, issue);

% Step 3: Resolve issues and enhance the image enhancedImage = resolveIssues(image, issue);

% Display the original and enhanced images

Figure;

Subplot(1, 2, 1);

Imshow(image);

Title(‘Original Image’);

Subplot(1, 2, 2);

Imshow(enhancedImage);

Title(‘Enhanced Image’);

End

Function imageType = detectImageType(image)

% Detect whether the image is Binary, Grayscale, or RGB If ndims(image) == 2 uniqueValues = unique(image); if length(uniqueValues) == 2 imageType = ‘Binary’; else

imageType = ‘Grayscale’; end

elseif ndims(image) == 3 imageType = ‘RGB’; else imageType = ‘Unknown’; end

end

function issue = analyzeImageIssues(image)

% Analyze the image for over dark, over bright, low contrast, or normal If ndims(image) == 3

gray Image = rgb2gray(image); % Convert RGB to Grayscale else gray Image = image; end

% Compute mean and standard deviation of pixel intensities mean Intensity = mean(gray Image(☺); stringently = std(double(gray Image(☺));

% Classify the issue based on thresholds

If mean Intensity < 50

Issue = ‘Over Dark’;

Elseif mean Intensity > 200

Issue = ‘Over Bright’;

Elseif stringently < 40

Issue = ‘Low Contrast’;

Else

Issue = ‘Normal’;

End

End

Function enhancedImage = resolveIssues(image, issue)

% Resolve the detected issue in the image

Switch issue Case ‘Over Dark’ enhancedImage = misadjust(image, [], [], 1.2); % Brighten case ‘Over Bright’ enhancedImage = misadjust(image, [], [], 0.8); % Darken case ‘Low Contrast’ if ndims(image) == 3 % RGB Image lab Image = rgb2lab(image);

L = lab Image(:, :, 1); L = histeq(L / 100) \* 100; lab Image(:, :, 1) = L; enhancedImage = lab2rgb(lab Image); else % Grayscale Image enhancedImage = histeq(image);

end

otherwise

enhancedImage = image; % No enhancement needed end

end