**UNIVERSITY OF THE PUNJAB**

**GUJRANWALA CAMPUS**

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**Department of Information Technology**

**Computer Vision**

**Assignment**

* **Submitted by:**

Hammad Bin Tariq

* **Session:**

BSIT 7th semester

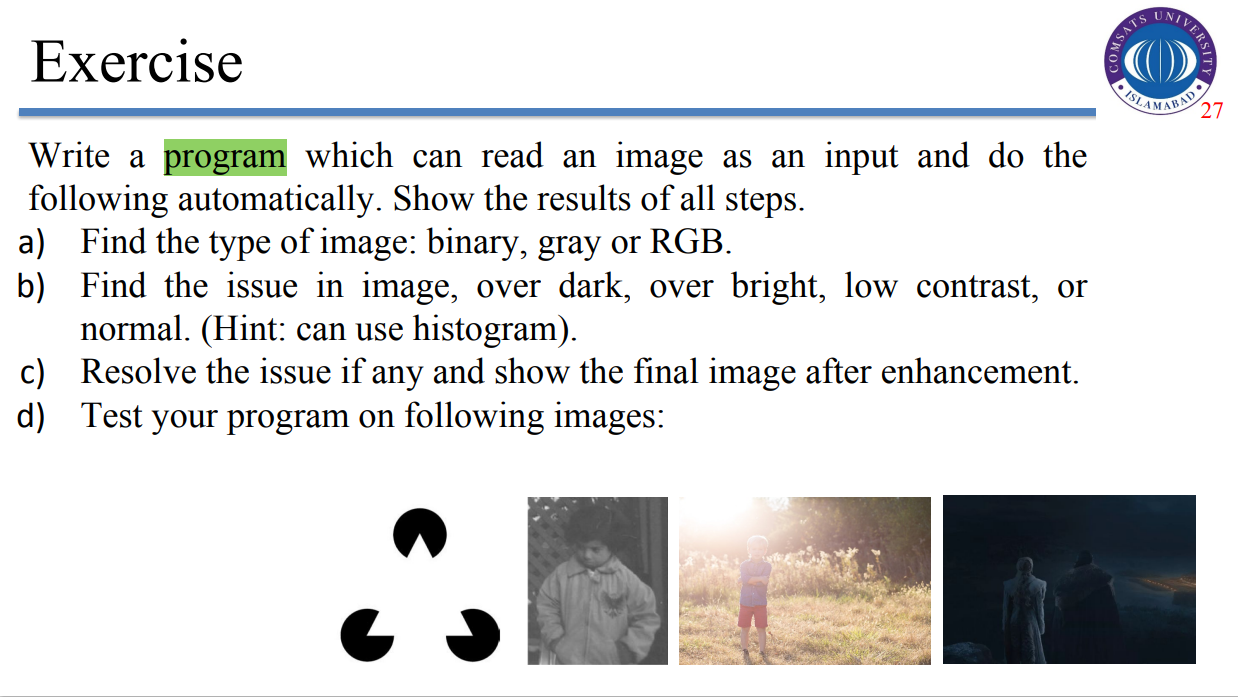
* **Roll no:**

(BIT21203) Afternoon

* **Submitted to:**

Mam Fouqia Zafeer

**Topic:**



**MATLAB Code:**

% Read the input image

[file, path] = uigetfile({'\*.png;\*.jpg;\*.jpeg'}, 'Select an Image');

image = imread(fullfile(path, file));

% Step 1: Detect Image Type (Binary, Grayscale, or RGB)

if ndims(image) == 3

disp('Image Type: RGB');

grayscale = rgb2gray(image); % Convert to grayscale for analysis

else

disp('Image Type: Grayscale');

grayscale = image;

end

% Check if the image is binary

if islogical(grayscale)

disp('Image Type: Binary');

end

% Step 2: Analyze the Issue (Histogram Analysis)

figure;

subplot(2, 3, 1);

imshow(image);

title('Original Image');

subplot(2, 3, 2);

imhist(grayscale);

title('Histogram');

% Determine image condition

mean\_intensity = mean(grayscale(:));

if mean\_intensity < 50

disp('Issue: Over Dark');

issue = 'dark';

elseif mean\_intensity > 200

disp('Issue: Over Bright');

issue = 'bright';

elseif std(double(grayscale(:))) < 30

disp('Issue: Low Contrast');

issue = 'low\_contrast';

else

disp('Image is Normal');

issue = 'normal';

end

% Step 3: Resolve the Issue

if strcmp(issue, 'dark')

% Apply Histogram Equalization

enhanced\_image = histeq(grayscale);

elseif strcmp(issue, 'bright')

% Apply Gamma Correction

gamma = 0.4; % Reduce brightness

enhanced\_image = uint8(255 \* ((double(grayscale) / 255) .^ gamma));

elseif strcmp(issue, 'low\_contrast')

% Apply Contrast Stretching

min\_intensity = double(min(grayscale(:)));

max\_intensity = double(max(grayscale(:)));

enhanced\_image = uint8(255 \* (double(grayscale) - min\_intensity) / (max\_intensity - min\_intensity));

else

enhanced\_image = grayscale; % No enhancement needed

end

% Step 4: Display the Enhanced Image

subplot(2, 3, 3);

imshow(enhanced\_image);

title('Enhanced Image');

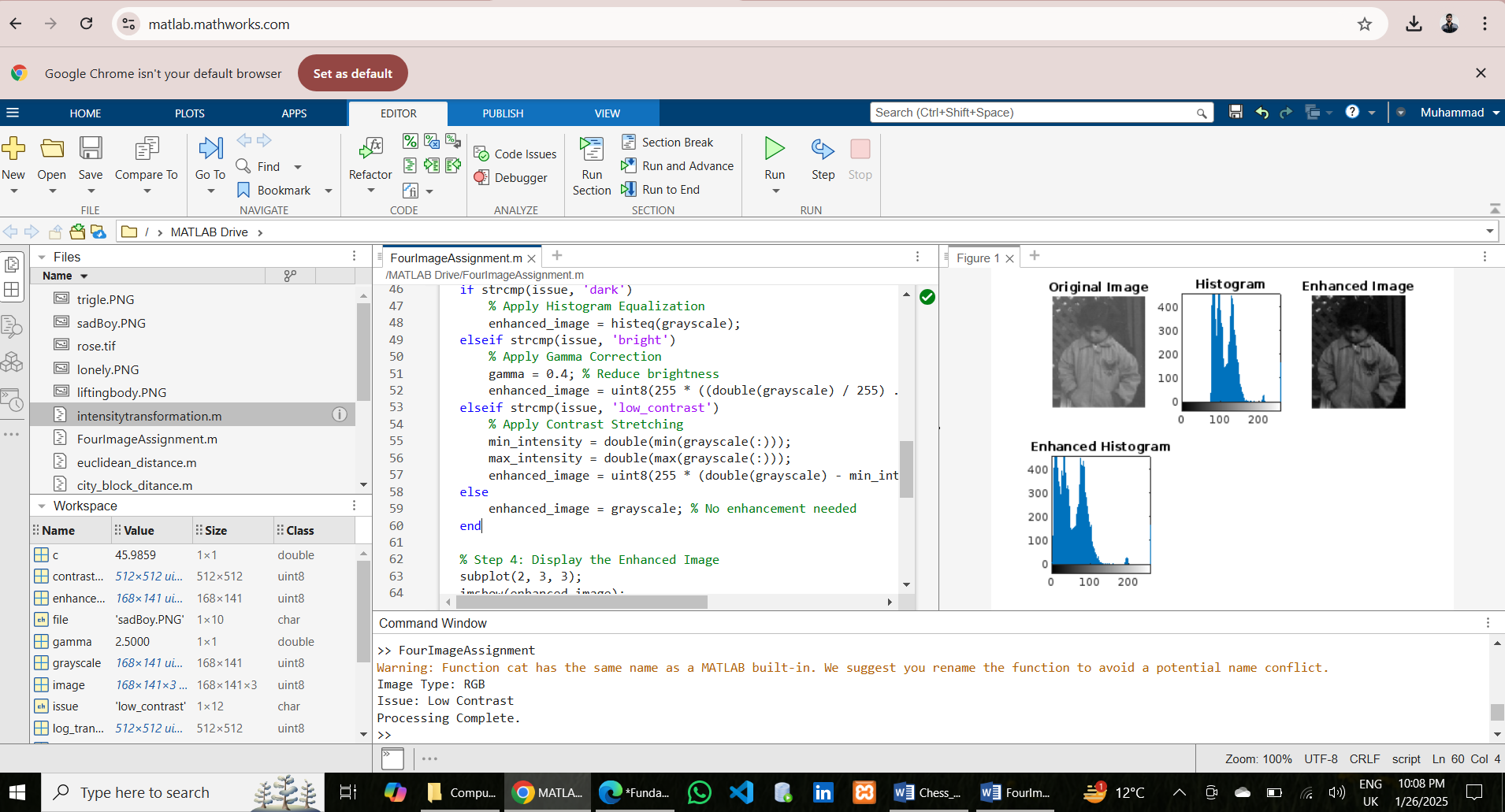
subplot(2, 3, 4);

imhist(enhanced\_image);

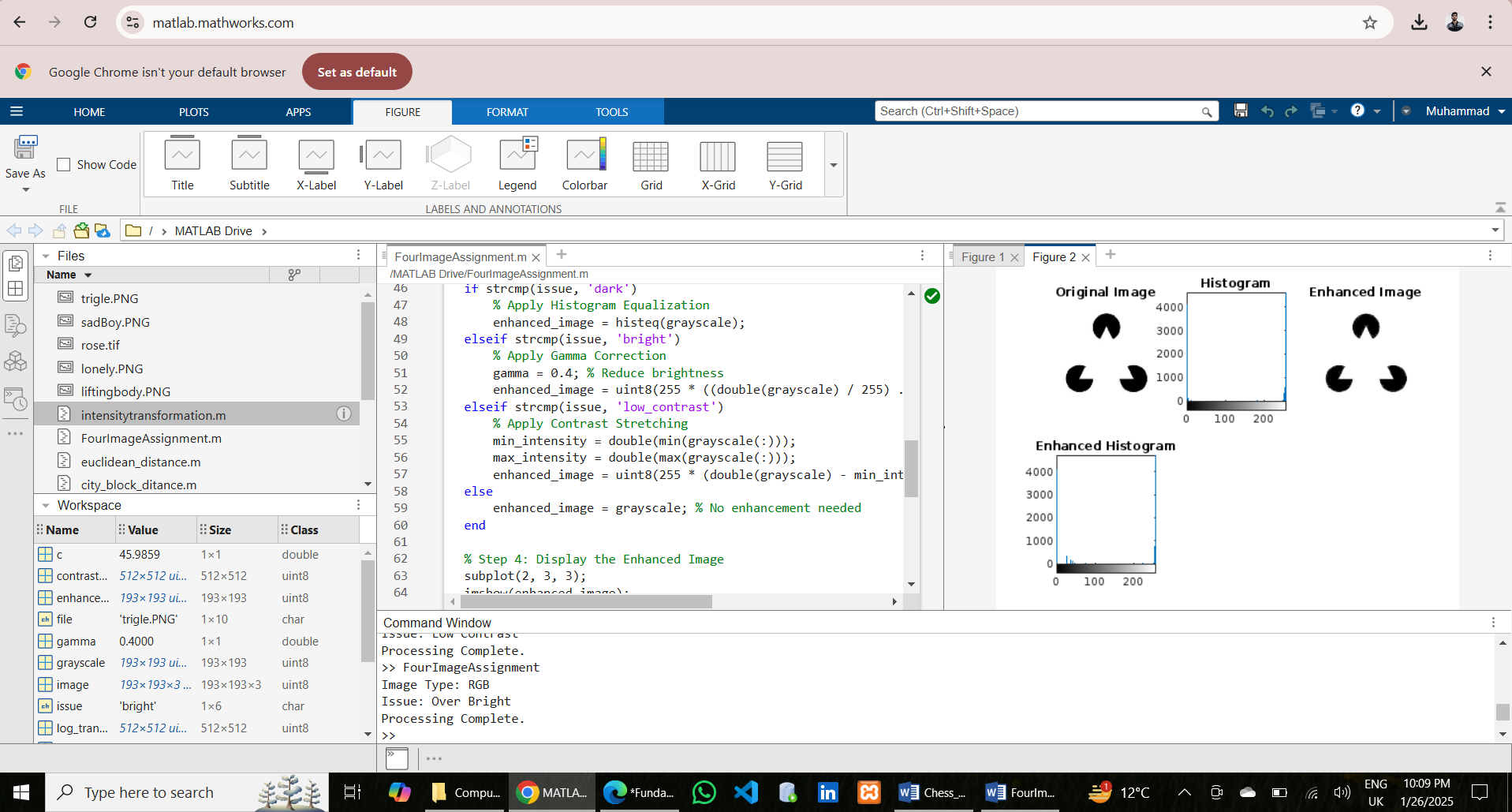
title('Enhanced Histogram');

disp('Processing Complete.');

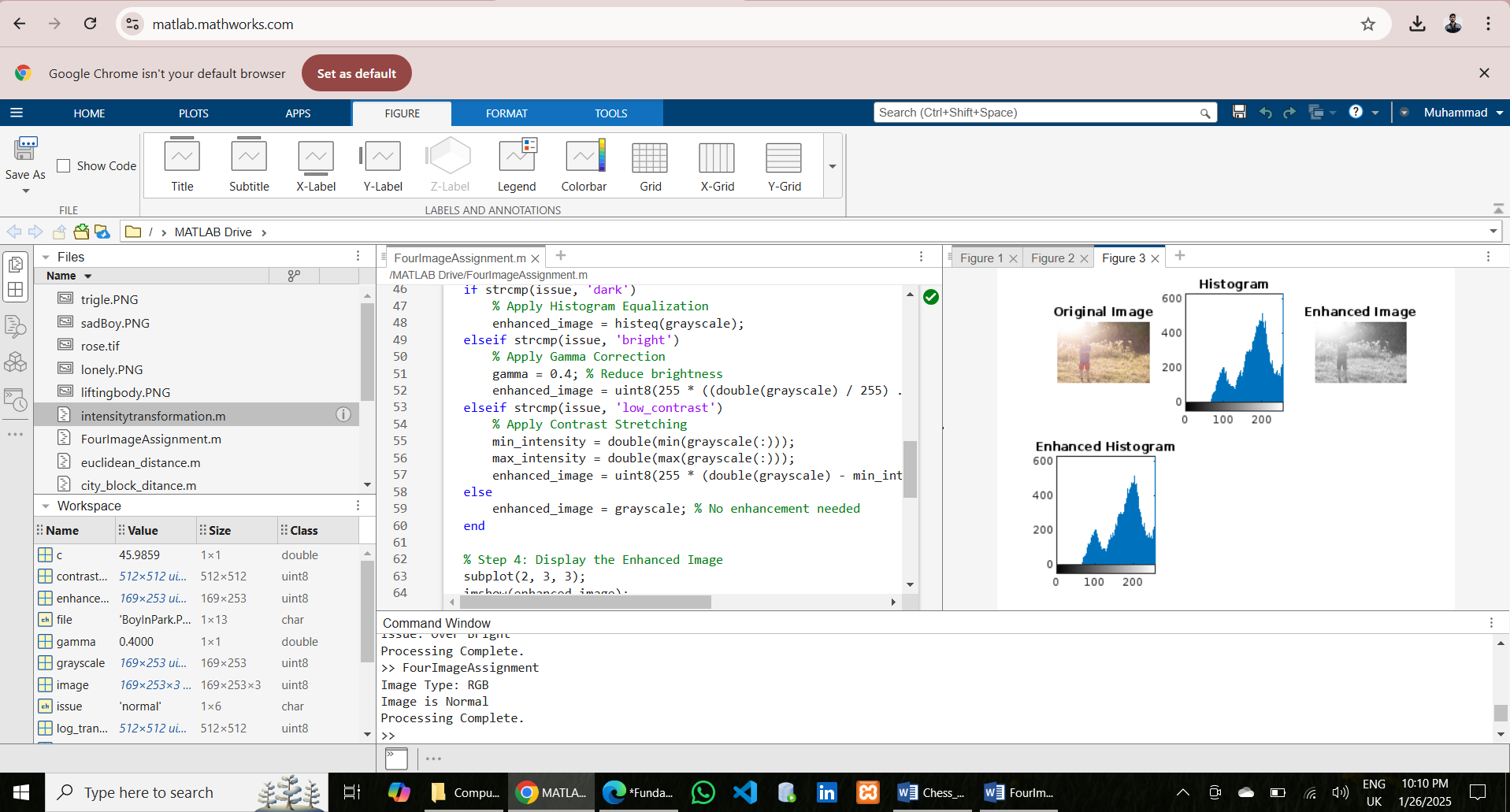
**First Output:**



**Second Output:**



**Third Output:**



**Fourth Output:**

