Ques. 1

(1)

```
Command Window
>> % Q1: Task (i)
img1 = imread('img_1.jpg');
img2 = imread('img_2.jpg');
size(img1)
size(img2)
resized_img = imresize(img1, [size(img2,1), size(img2,2)]);
figure;
subplot(1,2,1), imshow(img1), title('Original Image 1');
subplot(1,2,2), imshow(resized_img), title('Resized Image 1');

ans =

   400    400      3


ans =

       640       1024          3

fx >>
```

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Original Image 1

Resized Image 1

(2)

Image 1   Image 2   Added Image

```
>> % (ii) Load and add two images of your choice, displaying the result alongside the o
img2_resized = imresize(img2, [size(img1,1), size(img1,2)]);
added_img = imadd(img1, img2_resized); % Or simply: added_img = img1 + img2_resized;
figure;
subplot(1,3,1), imshow(img1), title('Image 1');
subplot(1,3,2), imshow(img2_resized), title('Image 2');
subplot(1,3,3), imshow(added_img), title('Added Image');
```
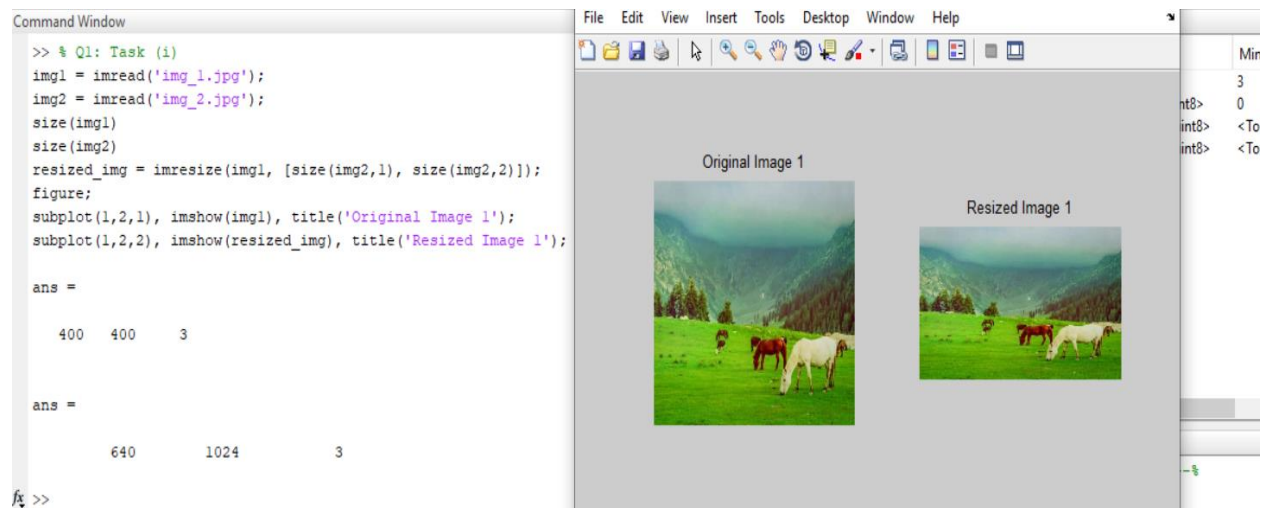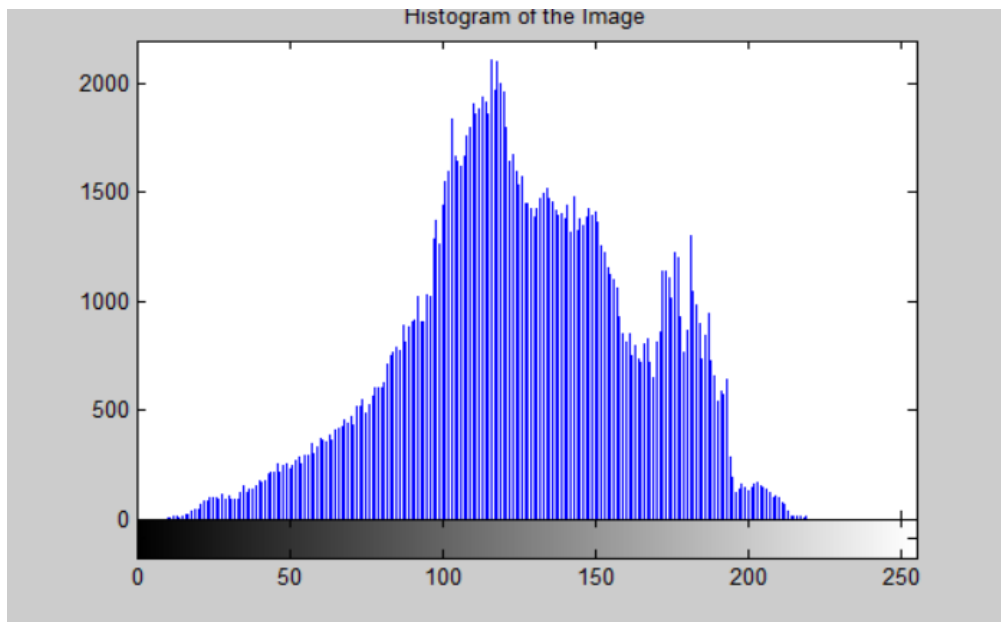
(3)

Histogram of the Image

```
>> % (iii) Generate a histogram of an image and analyze the distribution of pixel
img = imread('img_1.jpg');
gray_img = rgb2gray(img);
figure;
imhist(gray_img); % Displays the histogram of the grayscale image
title('Histogram of the Image');
```
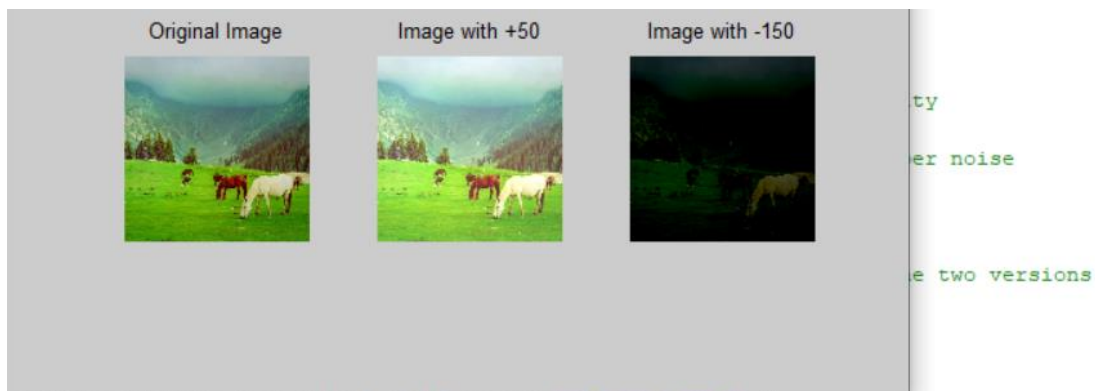
(4)

Original Image   Noisy Image

```
>> % (iv) Add noise to an image and observe its effect on image q
img = imread('img_1.jpg');
noisy_img = imnoise(img, 'salt & pepper', 0.02); % Adds salt-and-
figure;
subplot(1,2,1), imshow(img), title('Original Image');
subplot(1,2,2), imshow(noisy_img), title('Noisy Image');
```

(5)


```
>> % (v) Convert a colored image to grayscale and visually compare the two
gray_img = rgb2gray(img);
figure;
subplot(1,2,1), imshow(img), title('Colored Image');
subplot(1,2,2), imshow(gray_img), title('Grayscale Image');
```
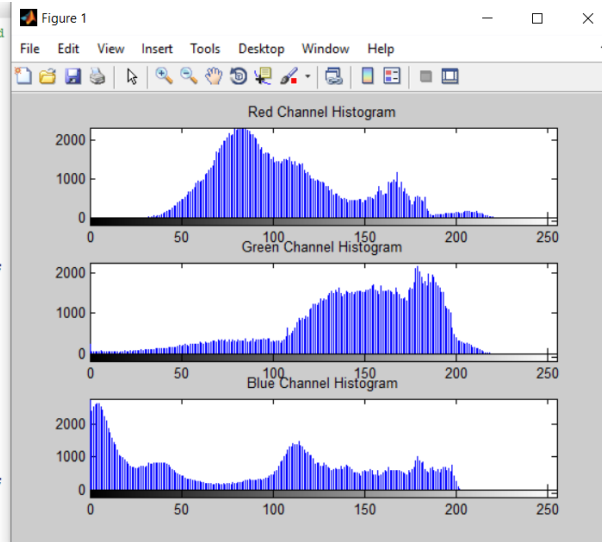
(6)


```
>> % (vi) Apply changes to pixel values in an image (add 50 to pixel values and subtract 150 fro
img_plus_50 = uint8(double(img) + 50);
img_minus_150 = uint8(max(double(img) - 150, 0));
figure;
subplot(1,3,1), imshow(img), title('Original Image');
subplot(1,3,2), imshow(img_plus_50), title('Image with +50');
subplot(1,3,3), imshow(img_minus_150), title('Image with -150');
% (vii) Document your observations and include the corresponding outputs
saveas(gcf, 'output_figure.png');
```

Ques. 2


```matlab
>> % Q2: Compare the histograms of an original and a grayscale-converted
% Load the Image
img = imread('img_1.jpg');
% Convert the Image to Grayscale
gray_img = rgb2gray(img);
% Generate the Histogram for the Original Image
red_channel = img(:,:,1); % Extract the red channel
green_channel = img(:,:,2); % Extract the green channel
blue_channel = img(:,:,3); % Extract the blue channel
% Plot histograms for each channel
figure;
subplot(3,1,1), imhist(red_channel), title('Red Channel Histogram');
subplot(3,1,2), imhist(green_channel), title('Green Channel Histogram');
subplot(3,1,3), imhist(blue_channel), title('Blue Channel Histogram');
% Generate the Histogram for the Grayscale Image
figure;
imhist(gray_img);
title('Grayscale Image Histogram');
% Visual Comparison of Histograms
figure;
subplot(2,2,1), imshow(img), title('Original Colored Image');
subplot(2,2,2), imhist(gray_img), title('Grayscale Histogram');
subplot(2,2,3), imhist(red_channel), title('Red Channel Histogram');
subplot(2,2,4), imhist(green_channel), title('Green Channel Histogram');
% Save the Output
saveas(gcf, 'histogram_comparison.png');
fx >>
```
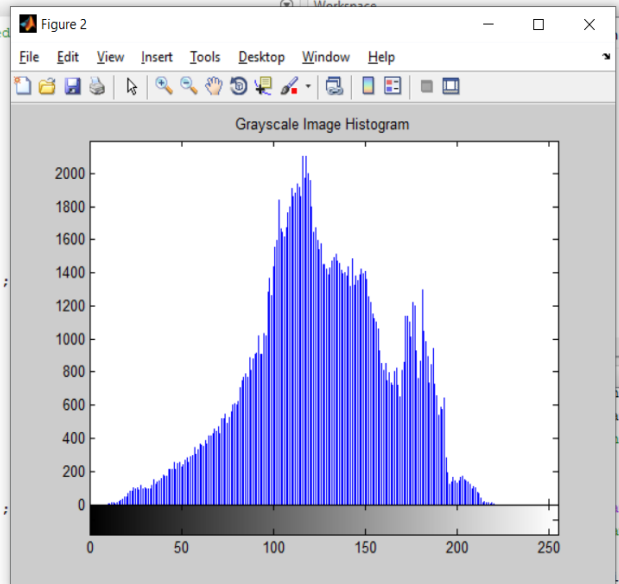


```matlab
>> % Q2: Compare the histograms of an original and a grayscale-converted
% Load the Image
img = imread('img_1.jpg');
% Convert the Image to Grayscale
gray_img = rgb2gray(img);
% Generate the Histogram for the Original Image
red_channel = img(:,:,1); % Extract the red channel
green_channel = img(:,:,2); % Extract the green channel
blue_channel = img(:,:,3); % Extract the blue channel
% Plot histograms for each channel
figure;
subplot(3,1,1), imhist(red_channel), title('Red Channel Histogram');
subplot(3,1,2), imhist(green_channel), title('Green Channel Histogram');
subplot(3,1,3), imhist(blue_channel), title('Blue Channel Histogram');
% Generate the Histogram for the Grayscale Image
figure;
imhist(gray_img);
title('Grayscale Image Histogram');
% Visual Comparison of Histograms
figure;
subplot(2,2,1), imshow(img), title('Original Colored Image');
subplot(2,2,2), imhist(gray_img), title('Grayscale Histogram');
subplot(2,2,3), imhist(red_channel), title('Red Channel Histogram');
subplot(2,2,4), imhist(green_channel), title('Green Channel Histogram');
% Save the Output
saveas(gcf, 'histogram_comparison.png');
>>
```

```matlab
>> % Q2: Compare the histograms of an original and a grayscale-converted
% Load the Image
img = imread('img_1.jpg');
% Convert the Image to Grayscale
gray_img = rgb2gray(img);
% Generate the Histogram for the Original Image
red_channel = img(:,:,1); % Extract the red channel
green_channel = img(:,:,2); % Extract the green channel
blue_channel = img(:,:,3); % Extract the blue channel
% Plot histograms for each channel
figure;
subplot(3,1,1), imhist(red_channel), title('Red Channel Histogram');
subplot(3,1,2), imhist(green_channel), title('Green Channel Histogram');
subplot(3,1,3), imhist(blue_channel), title('Blue Channel Histogram');
% Generate the Histogram for the Grayscale Image
figure;
imhist(gray_img);
title('Grayscale Image Histogram');
% Visual Comparison of Histograms
figure;
subplot(2,2,1), imshow(img), title('Original Colored Image');
subplot(2,2,2), imhist(gray_img), title('Grayscale Histogram');
subplot(2,2,3), imhist(red_channel), title('Red Channel Histogram');
subplot(2,2,4), imhist(green_channel), title('Green Channel Histogram');
% Save the Output
saveas(gcf, 'histogram_comparison.png');
>>
```

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```matlab
figure;
subplot(2,2,1), imshow(img),
```