

## Problem 1

```
import matplotlib.pyplot as plt
import numpy as np

# Path to the binary file
file_path1 = 'lena.bin' # Replace with the correct path
file_path2 = 'peppers.bin' # Replace with the correct path

# Read the binary file
with open(file_path1, 'rb') as file:
    data1 = np.fromfile(file, dtype=np.uint8)

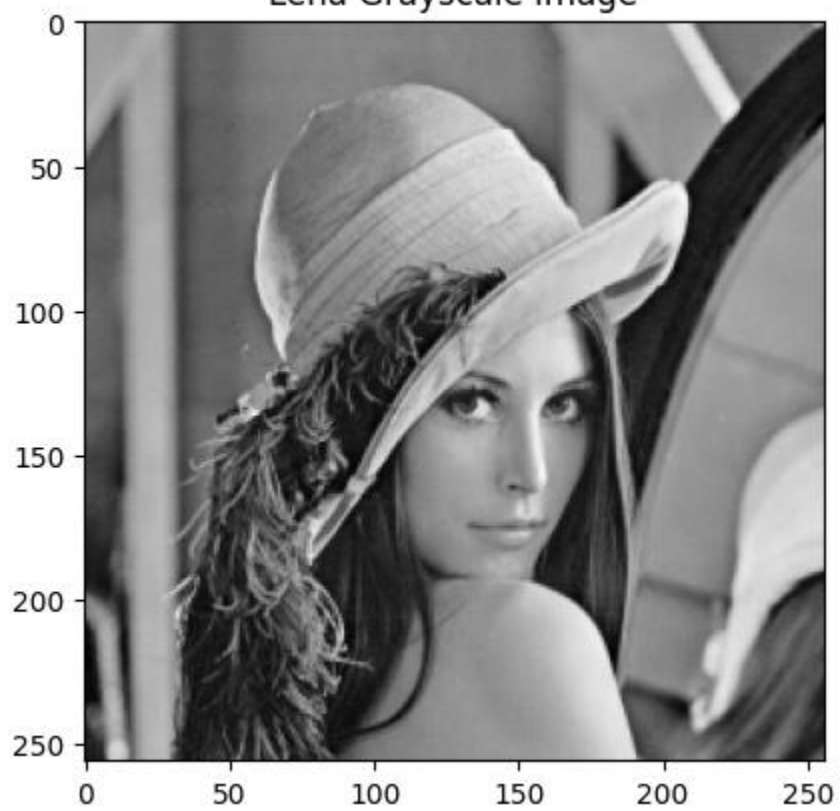
# Read the binary file
with open(file_path2, 'rb') as file:
    data2 = np.fromfile(file, dtype=np.uint8)

# Reshape data into a 256x256 grayscale images
image1 = data1.reshape((256, 256))
image2 = data2.reshape((256, 256))

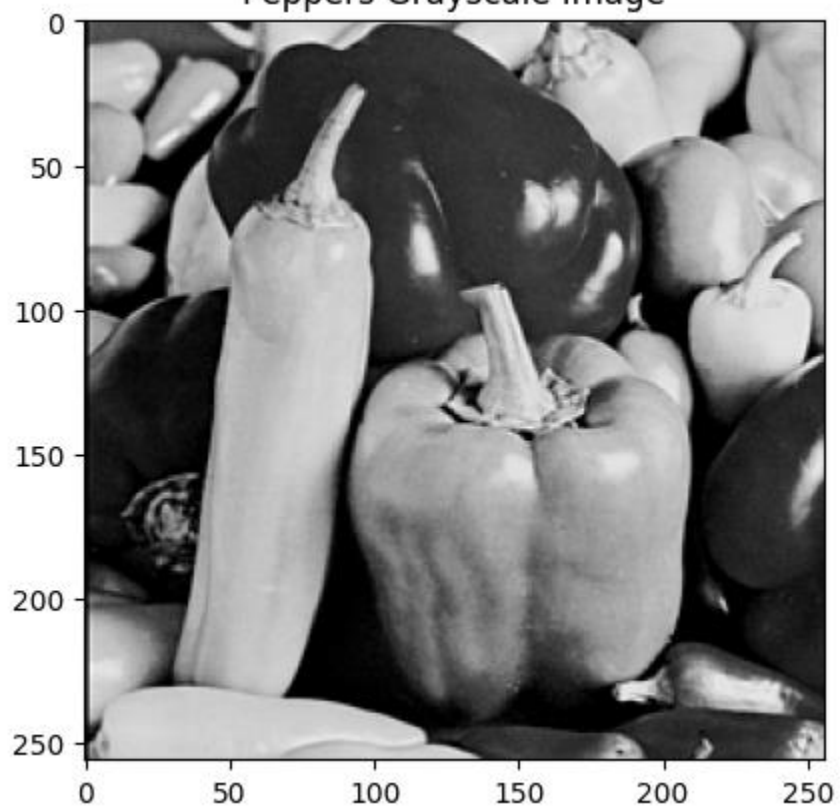
# Display the image
plt.imshow(image1, cmap='gray')
plt.title('Lena Grayscale Image')
plt.show()

plt.imshow(image2, cmap='gray')
plt.title('Peppers Grayscale Image')
plt.show()
```

Lena Grayscale Image



Peppers Grayscale Image



```

# import numpy as np
# import matplotlib.pyplot as plt

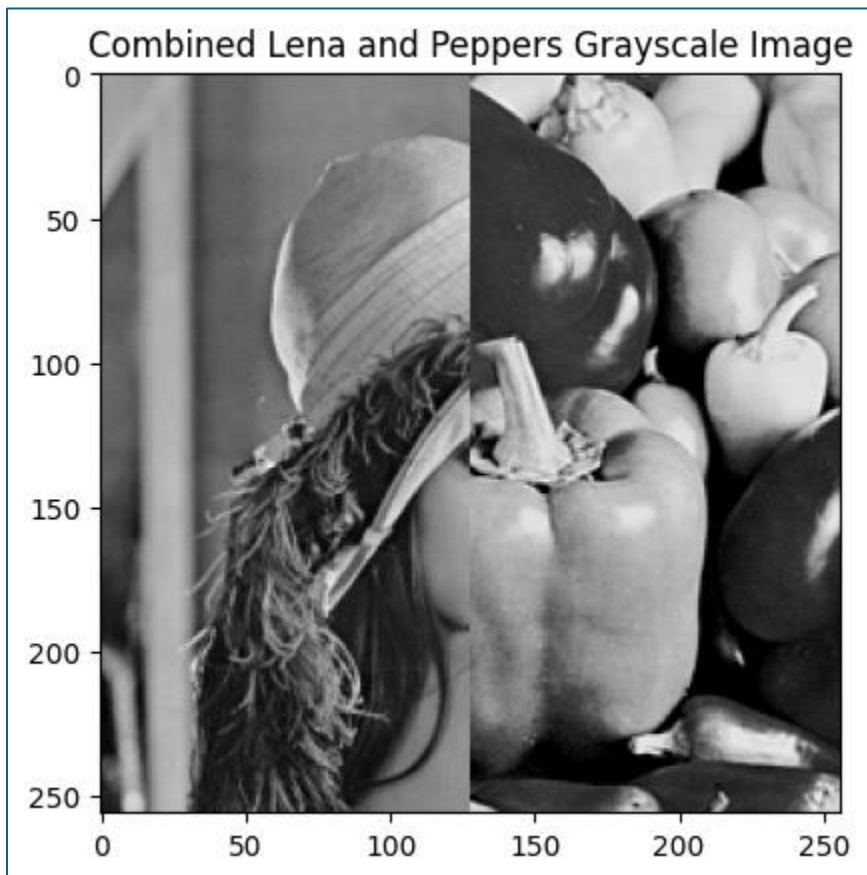
# Read and reshape the Lena.bin image
with open('lena.bin', 'rb') as file:
    lena_data = np.fromfile(file, dtype=np.uint8).reshape((256, 256))

# Read and reshape the Peppers.bin image
with open('peppers.bin', 'rb') as file:
    peppers_data = np.fromfile(file, dtype=np.uint8).reshape((256, 256))

# Create the new image J
J = np.zeros((256, 256), dtype=np.uint8)
J[:, :128] = lena_data[:, :128]      # Left half from Lena
J[:, 128:] = peppers_data[:, 128:]   # Right half from Peppers

# Display the new image
plt.imshow(J, cmap='gray')
plt.title('Combined Lena and Peppers Grayscale Image')
# plt.axis('off')
plt.show()

```



```
# import numpy as np

# import matplotlib.pyplot as plt
# running in Jupyter Notebook

# Read and reshape the Lena image
with open('lena.bin', 'rb') as file:
    lena_data = np.fromfile(file, dtype=np.uint8).reshape((256, 256))

# Read and reshape the Peppers image
with open('peppers.bin', 'rb') as file:
    peppers_data = np.fromfile(file, dtype=np.uint8).reshape((256, 256))

# Create the new image J
J = np.zeros((256, 256), dtype=np.uint8)
J[:, :128] = peppers_data[:, 128:] # Right half from Peppers
J[:, 128:] = lena_data[:, :128]    # Left half from Lena

# Display the new image
plt.imshow(J, cmap='gray')
plt.title('Flipped Combined Lena and Peppers Grayscale Image')
plt.axis('off')
plt.show()
```

Flipped Combined Lena and Peppers Grayscale Image



## Problem 2

```
% Read the Original Image
J1 = imread('lenagray.jpg','jpg');

% Draw on figure 1
figure(1);

% Create a colormap
colormap(gray(256));

% Draw J1
image(J1);

% Add an axis on the image
axis('image');

% Add a title
title('The Lena Image');

% Negative Image from J1
J2 = 255 - J1;

% Create a new figure
figure(2);

% make a colormap
colormap(gray(256));

% Create an Image from J2
image(J2);

% Add an axis to the figure
axis('image');

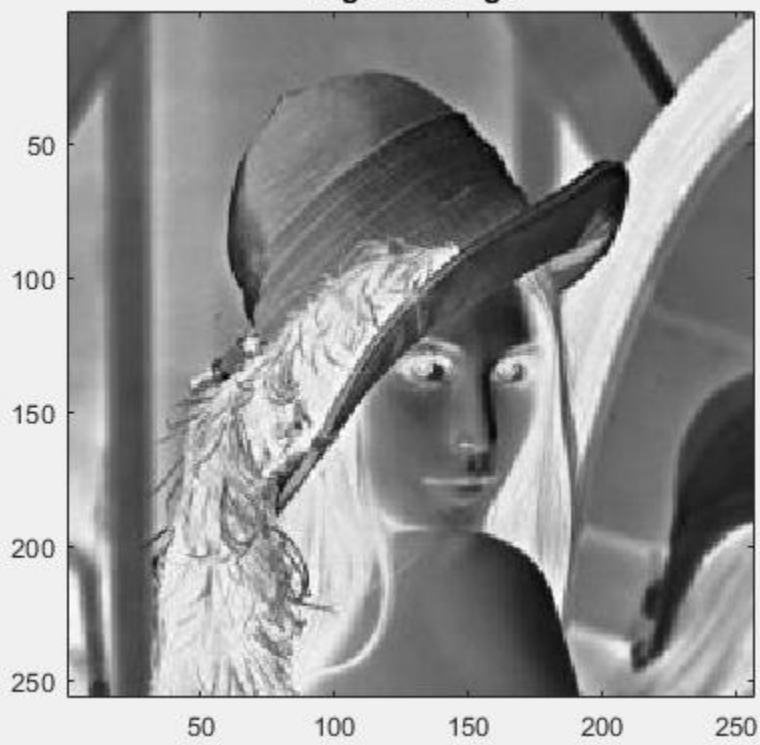
% Make the title
title('The Negative Image');

% Write out result as JPEG
imwrite(J2,'Negative Lena Image.jpg','jpg');
```

**Lena Image**



**Negative Image**



### Problem 3

```
% Show the Original Image
J1 = imread('lena512color.jpg','jpg');

% Select Figure 1 to draw on
figure(1);

% Render the Image to Figure 1
image(J1);

%Make a Title
title('Original lena512color.jpg Image');

%Show the Axis
axis('image');

% Copy the J1 Image
J2 = J1;

% Red band of J2 = Blue band of J1
J2(:,:,1) = J1(:,:,3);

% Green band of J2 = Red band of J1
J2(:,:,2) = J1(:,:,1);

% Blue band of J2 = Green band of J1
J2(:,:,3) = J1(:,:,2);

% Draw New Image on figure 2
figure(2);

% Draw image the new image
image(J2);

%Make title for
title('New image with switched color bands');

% add axis to the image
axis('image');

% Write a new image file
imwrite(J2,'LenaColorSwitch.jpg','jpg');
```



New image with switched color bands



Original lena512color.jpg Image

