LAB 8: IMAGE COMPRESSION TECHNIQUES-2: DISCRETE WAVELET TRANSFORM (DWT)

Experiment No. 38 Use discrete wavelet transform to compress an image

1. Read an image into the workspace, then convert the image to grayscale.

```
RGB = imread('autumn.tif');

I = im2gray(RGB);
```

2. Obtain the single-level 2-D discrete wavelet transform of the image using the order 4 symlet.

```
[cA,cH,cV,cD] = dwt2(I,'sym4');
```

3. Display the approximation and detail coefficients.

```
subplot(2,2,1)

imshow(uint8(cA))

colormap gray

title('Approximation')

subplot(2,2,2)

imshow(uint8(cH))

colormap gray

title('Horizontal')

subplot(2,2,3)

imshow(rescale(cV))

colormap gray

title('Vertical')

subplot(2,2,4)

imshow(rescale(cD))

colormap gray

title('Diagonal')
```

Task:

- Run the experiment and show the results in figure 1.
- Use **idwt2** to reconstruct the image based on the approximation coefficients matrix cA and show the result in figure 2.
- Use another wavelet filter (e.g. db, haar, etc) to obtain the discrete wavelet transform of the image and compare the approximation coefficients (cA) between the two filters in figure 3.