

LABWORK 1.1

`%Converts a colour image to binary`

```
RGB_image = imread ('peppers.png');  
BW_image = im2bw (RGB_image);  
figure, imshow(BW_image);
```



ORIGINAL IMAGE



IMAGE IN BINARY

- `RGB_image= imread (filename)` reads the image from the file named filename, inferring the file's format from its contents. If filename is a multi-image file, `imread` only reads the first image.
- The function `BW_image = im2bw (RGB_image)` converts a truecolor RGB image to a binary picture.
- The code `imshow(BW_image)` is used to show the image after applying certain function

LABWORK 1.2

`%Converts a colour image to grayscale`

```
RGB_image = imread('peppers.png');  
gray_image=rgb2gray(RGB_image);  
figure, imshow(gray_image);
```



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GRayscale IMAGE

- `gray_image=rgb2gray (RGB_image);` transforms `RGB_image` to `gray_image`, a grayscale image. The `rgb2gray` function transforms RGB images to grayscale by removing the hue and saturation information while keeping the brightness information.

LABWORK 1.3

`%Converts a colour image to indexed image`

```
RGB = imread ('peppers.png');  
[index_img, map] = rgb2ind(RGB,16);  
figure, imshow(index_img, map);
```



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INDEXED IMAGE

- `rgb2ind` converts an RGB image to an indexed image, reducing the number of colors in the process.
- `[X,cmap] = rgb2ind(RGB,tol)` converts the RGB image to an indexed image using uniform quantization with tolerance `tol` and dithering. OR
- `[X,cmap] = rgb2ind(RGB,Q)` converts the RGB image to an indexed image `X` with associated colormap `cmap` using minimum variance quantization with `Q` quantized colors and dithering

LABWORK 1.4

`%Converts a grayscale image to undersampled grayscale image`

```
I = imread ('grayscale.jpg');  
s = 16; % undersampling factor  
[row,col,dim] = size(I);  
if(dim ==1)  
    undersampled_I = I([1:s:row],[1:s:col]);  
else  
    undersampled_I = I([1:s:row],[1:s:col],[1:1:dim]);  
end  
figure, imshow(undersampled_I);
```



ORIGINAL IMAGE



UNDERSAMPLED IMAGE

- The output image will be downgraded which means the quality of image will become low depends on the undersampling factors