Contents

environment Setup

```
close all;  % Closes all open figure windows to clear the screen
clear;      % Deletes all variables from the workspace to prevent data overlap
clc;        % Clears the command window text for a clean output
```

Image Acquisition

imread reads the image file into a matrix 'I' 'I' will be an M x N x 3 matrix for a standard RGB color image

```
I = imread('C:\Users\Abhishek\Desktop\DIP\image.jpg');
```

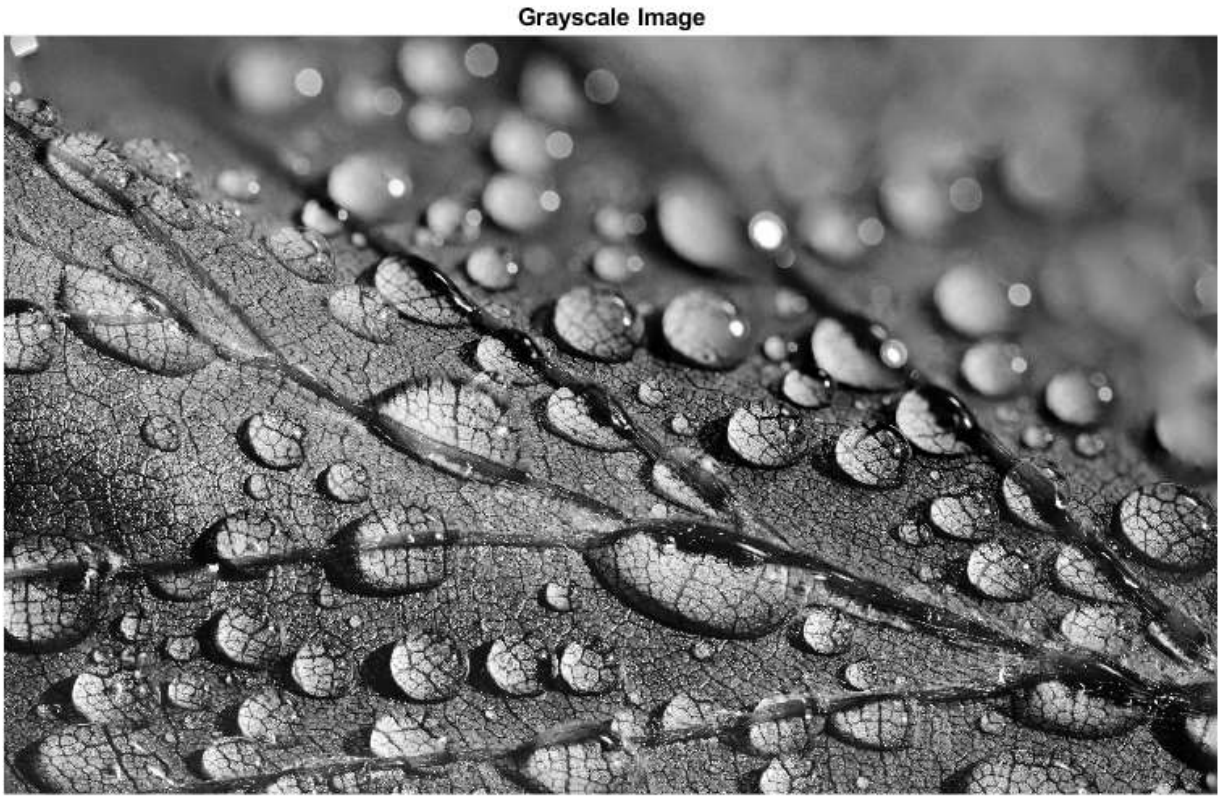
Original Image Display

```
imshow(I);  % Renders the color image in the current figure window
title('Original RGB Image'); % Recommended: adds a title to identifying the window
figure();   % Creates a new figure window so the next image doesn't overwrite this one
```

Grayscale Conversion

rgb2gray uses a weighted sum (0.2989*R + 0.5870*G + 0.1140*B) to convert the 3-layer color image into a single intensity layer

```
Igr = rgb2gray(I);
imshow(Igr);
title('Grayscale Image');
```



Red Channel Extraction

We copy the original image to keep it intact, then modify the copy

```
Ired = I;
figure();

% In an RGB matrix, index 1 is Red, 2 is Green, and 3 is Blue.
% Setting layers 2 and 3 to 0 effectively "mutes" the green and blue
Ired(:,:,2) = 0; % Sets the Green channel intensity to zero for all pixels
Ired(:,:,3) = 0; % Sets the Blue channel intensity to zero for all pixels

% The result is an image where only the Red light data is displayed
imshow(Ired);
title('Red Channel Only');
figure();
```

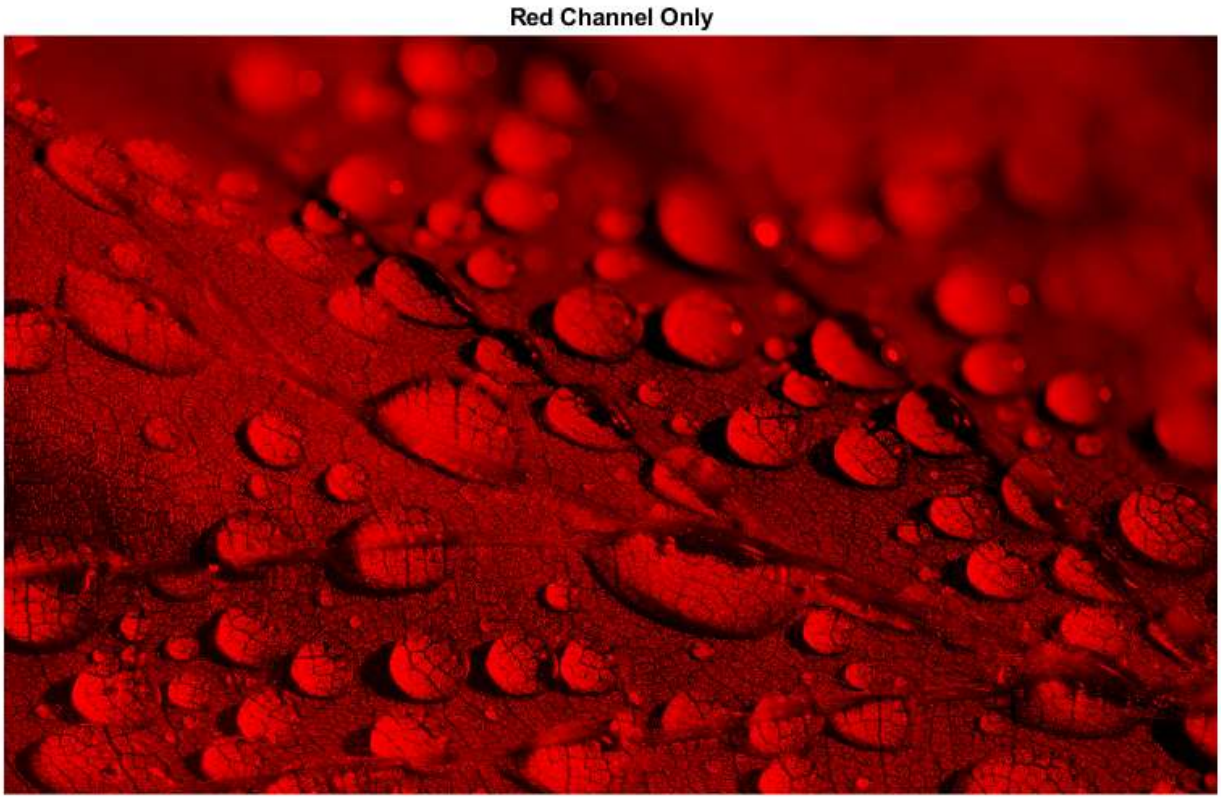
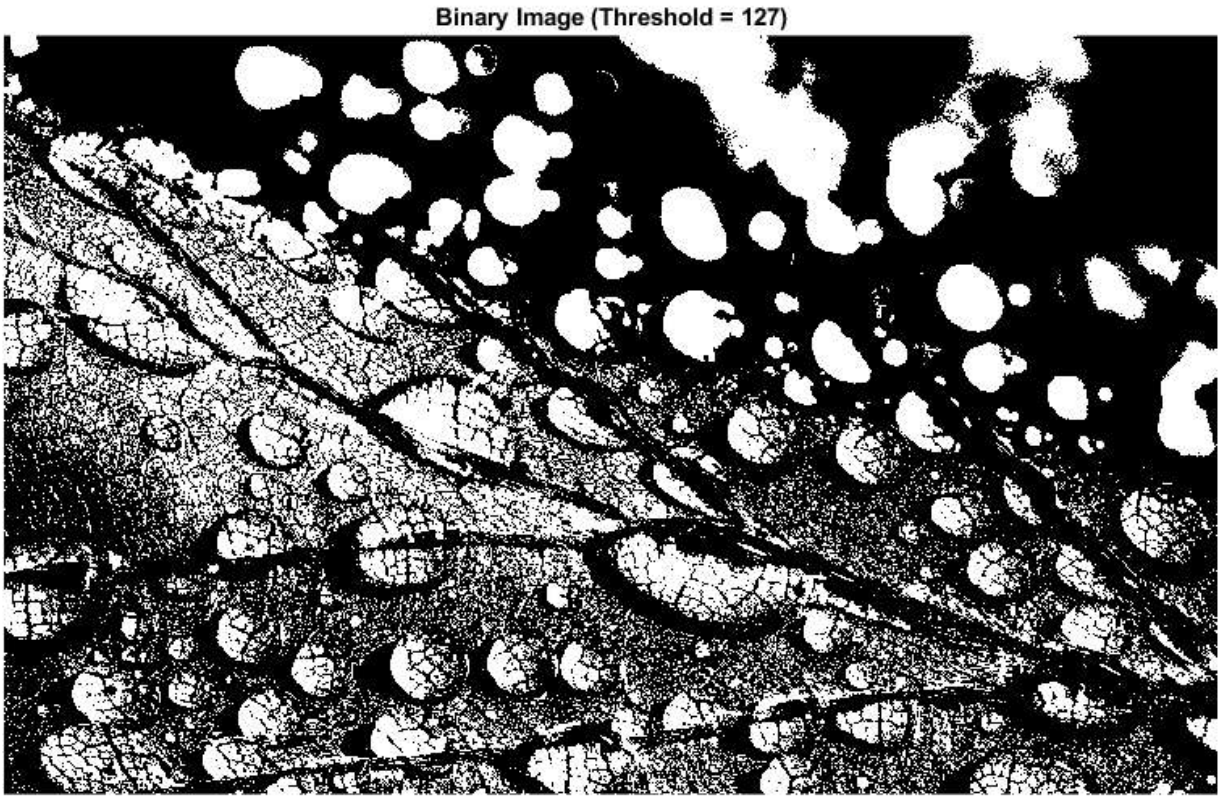


Image Binarization (Thresholding)

This creates a logical matrix (Binary Image). If a pixel value in Igr is > 127, it becomes 1 (White). If it is 127 or lower, it becomes 0 (Black).

```
Ib = Igr > 127;
imshow(Ib);
title('Binary Image (Threshold = 127)');
```



Histogram Equalization

```
figure();
% histeq spreads out the most frequent intensity values.
% It increases the global contrast of the image, especially when
% the usable data is represented by close contrast values.
Ieq = histeq(Igr);

% Display the final contrast-enhanced grayscale image
imshow(Ieq);
title('Histogram Equalized Image');
```

Histogram Equalized Image

Published with MATLAB® R2021a