```matlab
% Experiment 1: Fundamental Operations for Image Processing
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% Date: 18/01/2026

clc;
clear all;
close all;

% Generating a random 8x8 matrix (b/w 0-255)
B = randi([0, 255], 8, 8);
disp('8x8 Random Matrix:');
disp(B);

%Reading and displaying the original image
I = imread("vaibhav.jpg");
figure(1);
imshow(I);
title('Original Color Image');

%Conversion of RGB image to Grayscale
Ig = rgb2gray(I);
figure(2);
imshow(Ig);
title('Grayscale Conversion');

%Red Channel Extraction
%keep the Red channel and set Green (2) and Blue (3) to zero
I_red = I;
I_red(:,:,2) = 0;
I_red(:,:,3) = 0;
figure(3);
imshow(I_red);
title('Red Only');

%Black and White conversion)
%threshold at 100
Ib = Ig > 100;
figure(4);
imshow(Ib);
title('Black and White');

8x8 Random Matrix:
   165    155    215     81    139    103     49    100
   173    115    213     30    184    114     35    171
   162    117     65    240    133     93    178    189
   241    169    157    165    254    195     24    133
    53    197    149    122     55    160    134     89
   181     89    138    163     27    197    135     38
    60    169    222    139     28    238    220    150
    30    106     67    165     16    249    124     67
```

Original Color Image

Grayscale Conversion

Red Only

Black and White

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