Task 5 (1):

```
img = imread(sourcePath);
grayImg = imread(resizedPath);
    grayPath = strcat(GRAY_FOLDER_PATH,imageName,FORMAT);

    redChannel = grayImg(:,:,1);
    greenChannel = grayImg(:,:,2);
    blueChannel = grayImg(:,:,3);

    [imgHeight, imgLength] = size(redChannel);

    grayscaleChannel = zeros(imgHeight, imgLength);
    blackwhiteChannel = zeros(imgHeight, imgLength);

    for i = 1:imgHeight
        for j = 1:imgLength
            grayscaleValue = 0.2989 * redChannel(i,j) + 0.5870 *
greenChannel(i,j) + 0.1140 * blueChannel(i,j);
            grayscaleChannel(i, j) = grayscaleValue;
        end
    end
    imwrite(redChannel, grayPath);
```

Task 5 (2):

```
img = imread(sourcePath);
grayImg = imread(resizedPath);
    grayPath = strcat(GRAY_FOLDER_PATH,imageName,FORMAT);

    redChannel = grayImg(:,:,1);
    greenChannel = grayImg(:,:,2);
    blueChannel = grayImg(:,:,3);

    [imgHeight, imgLength] = size(redChannel);

    grayscaleChannel = zeros(imgHeight, imgLength);
    blackwhiteChannel = zeros(imgHeight, imgLength);

    for i = 1:imgHeight
        for j = 1:imgLength
            grayscaleValue = 0.2989 * redChannel(i,j) + 0.5870 *
greenChannel(i,j) + 0.1140 * blueChannel(i,j);
            grayscaleChannel(i, j) = grayscaleValue;
        end
    end
    imwrite(redChannel, grayPath);


    % converting grayscale images to BW
    bwPath = strcat(BW_FOLDER_PATH,imageName,FORMAT);

    for i = 1:imgHeight
        for j = 1:imgLength
            if grayscaleChannel(i, j) < THRESHOLD
                blackwhiteChannel(i, j) = 0;
            else
                blackwhiteChannel(i, j) = 1;
            end
```

```matlab
        end
    end

    imwrite(blackwhiteChannel, bwPath);

    % converting BW matrix to vector
    bwVector = blackwhiteChannel';
    bwVector = bwVector(:)';

    % adding the binary image to a matrix
    imagesFinalMatrix(imageIndex,:) = bwVector;
    writematrix(imagesFinalMatrix, 'matrix.csv')
```

Task 5 (3):

```matlab
% To Print the foreground pixel count and background pixel count
imgBW= imread(bwPath);

foregroundPixelCount= sum(imgBW(:)==1);
backgroundPixelCount= sum(imgBW(:)==0);

fprintf('Total Foreground pixels: %d\n', foregroundPixelCount);

fprintf('Total Background pixels: %d\n', backgroundPixelCount);
```

Task 5 (4):

```matlab
img = imread(sourcePath);
    imgResized = imresize(img, [225 225]);
    resizedPath = strcat(RESIZED_FOLDER_PATH,imageName,FORMAT);
    imwrite(imgResized, resizedPath);


foregroundPixelCount= sum(img(:)==1);
backgroundPixelCount= sum(img(:)==0);

fprintf('Total Foreground pixels: %d\n', foregroundPixelCount);

fprintf('Total Background pixels: %d\n', backgroundPixelCount);

pixelCountMatrix = [];

pixelCountMatrix = [pixelCountMatrix, foregroundPixelCount,
backgroundPixelCount];

writematrix(pixelCountMatrix, 'PixelCountMatrix.csv')
```