%declares variables for each image.

penguin = imread('Penguins.jpg');

img1 = imread('img1.jpg');

img2 = imread('img2.jpg');

%resizes img2 to the same size as img1.

jResize = imresize(img2, [768, 1024]);

%extract the individual red, green & blue colour channels;

redChannel = jResize(:, :, 1);

greenChannel = jResize(:, :, 2);

blueChannel = jResize(:, :, 3);

%function to denoise resized img2.

denoisedRedChannel = wiener2(redChannel,[9 9]);

denoisedGreenChannel = wiener2(greenChannel,[9 9]);

denoisedBlueChannel = wiener2(blueChannel,[9 9]);

%recombine seperate colour channels into an RGB image.

jResize = cat(3, denoisedRedChannel, denoisedGreenChannel, denoisedBlueChannel);

%a nested for loop to find the white space in the img1.

for i = 1:size(img1, 1)

for j = 1:size(img1, 2)

%an if loop to run throught the rgb scale.

if img1(i, j) > 253

img1(i, j, 1) = jResize(i, j, 1);

img1(i, j, 2) = jResize(i, j, 2);

img1(i, j, 3) = jResize(i, j, 3);

end

end

end

%imshow(img1);

%title('img1 blanks filled in');

%imshow(img2);

%title('img2 denoised');

%calculates the similarity.

sum1 = abs(img1-penguin);

percentageDifference = sum(sum1(:))/2359296;

%2359296 derived from 768x1024x3

finalsum = sum(sum1(:)) / 2359296;