Practical 6

Aim: WAP for color image processing: Color approximation & quantization.

a) Color approximation

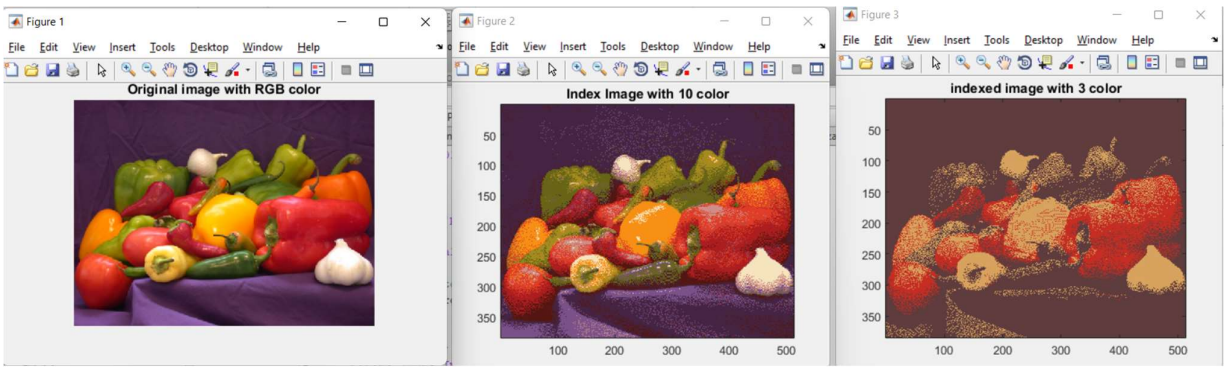
Code:

Editor - D:\Marwadi\SEM-5\IP-lab\Prg\color_approximation.m

colorimg_1.m | colorimg_2.m | colorimg_3.m | color_approximation.m

```
fprintf('92000103073-Raj Chhadia');
clc;
clear;

RGB = imread('peppers.png');
imshow(RGB);
title('Original image with RGB color');

%convert RGB to an indexed image with 10 colors
[IND, map] = rgb2ind(RGB,10);
figure,
image(IND);
colormap(map);
title('Index Image with 10 color');

[Y,newmap] = imapprox(IND,map,3);
figure,
image(Y);
colormap(newmap);
title('indexed image with 3 color');
```

Output:



b) Color approximation

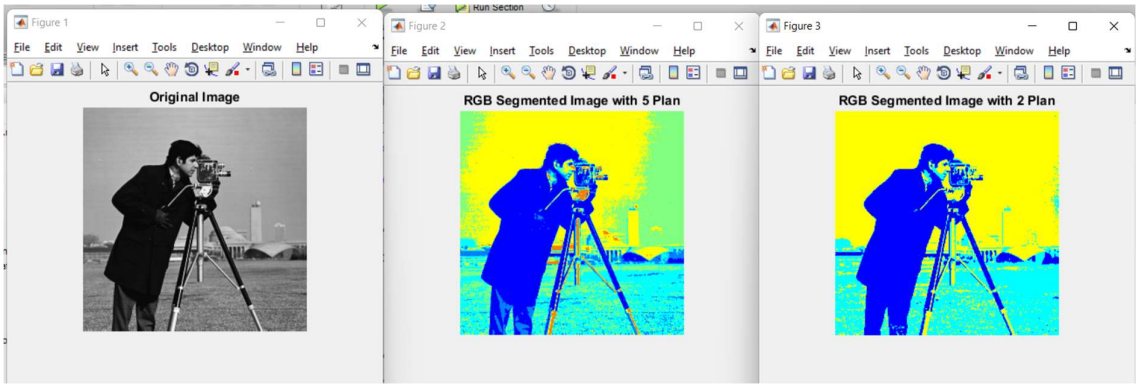
Code:

Editor - D:\Marwadi\SEM-5\IP-lab\Prg\color_quantization.m

colorimg_1.m | colorimg_2.m | colorimg_3.m | color_approximation.m | color_quantization.m

```
fprintf('92000103073-Raj Chhadia');
I = imread('cameraman.tif');
imshow(I);
title('Original Image');

thresh = multithresh(I,7);
seg_I = imquantize(I,thresh);

RGB = label2rgb(seg_I);
figure;
imshow(RGB)
title('RGB Segmented Image with 7 Plan');

thresh = multithresh(I,2);
seg_I = imquantize(I,thresh);

RGB = label2rgb(seg_I);
figure;
imshow(RGB)
title('RGB Segmented Image with 2 Plan');
```

Output:



Extra:

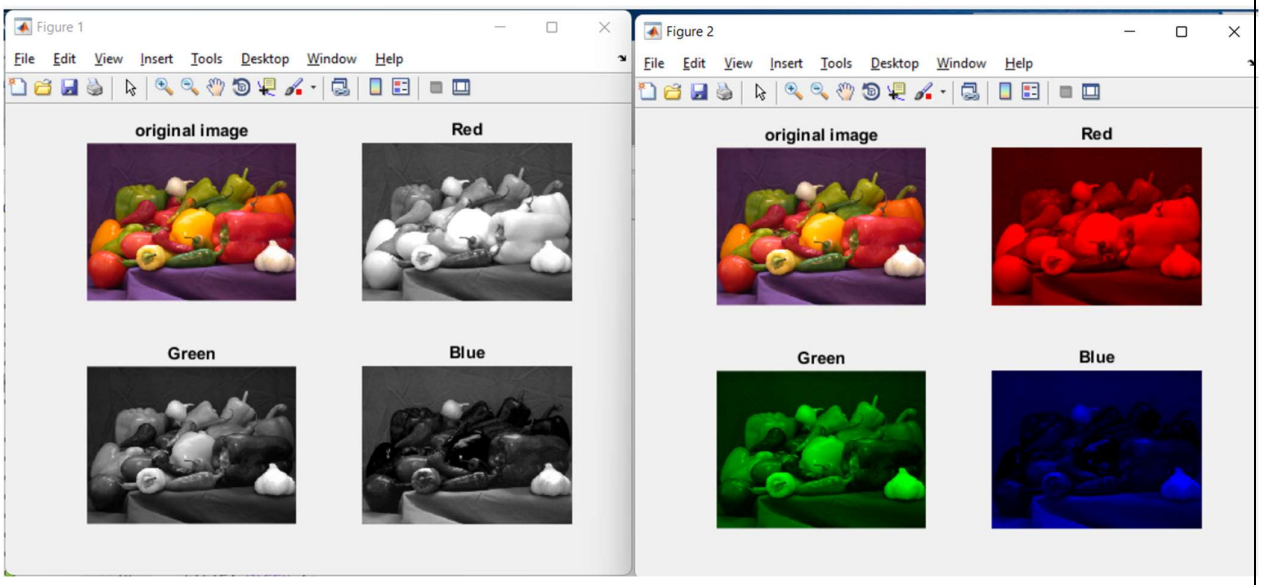
1. **Display Color Image into RGB Components (in Gray and Color Image)**

Editor - D:\Marwadi\SEM-5\IP-lab\Prg\colorimg_1.m

colorimg_1.m | colorimg_2.m | colorimg_3.m

```
fprintf('92000103073-Raj Chhadia');
I = imread('peppers.png');

R = I(:,:,1);
G = I(:,:,2);
B = I(:,:,3);

subplot(2,2,1);
imshow(I);
title('original image');

subplot(2,2,2);
imshow(R);
title('Red');

subplot(2,2,3);
imshow(G);
title('Green');

subplot(2,2,4);
imshow(B);
title('Blue');

RR=I;
GG=I;
BB=I;
```

```
BB=I;

RR(:,:,2)=0;
RR(:,:,3)=0;

GG(:,:,1)=0;
GG(:,:,3)=0;

BB(:,:,1)=0;
BB(:,:,2)=0;

figure
subplot(2,2,1);
imshow(I);
title('original image');

subplot(2,2,2);
imshow(RR);
title('Red');

subplot(2,2,3);
imshow(GG);
title('Green');

subplot(2,2,4);
imshow(BB);
title('Blue');
```

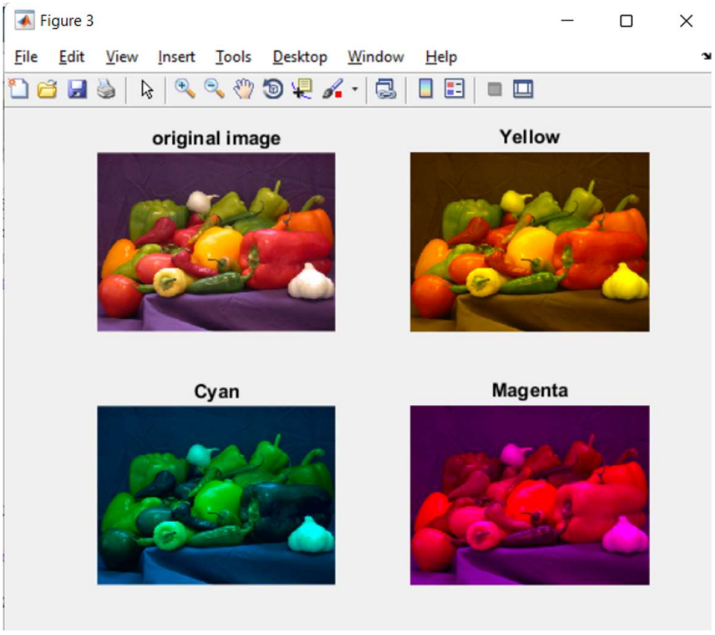


2. Display Color Image into CMY Components

Editor - D:\Marwadi\SEM-5\IP-lab\Prg\colorimg_2.m

colorimg_1.m | colorimg_2.m | colorimg_3.m

```
1 -  fprintf('92000103073-Raj Chhadia');
2 -  I = imread('peppers.png');
3 -  RR=I;
4 -  GG=I;
5 -  BB=I;
6
7 -  RR(:,:,3)=0; % B=0 yellow
8 -  GG(:,:,1)=0; % R=0 cyan
9 -  BB(:,:,2)=0; % G=0 magenta
10
11 -  figure
12 -  subplot(2,2,1);
13 -  imshow(I);
14 -  title('original image');
15
16 -  subplot(2,2,2);
17 -  imshow(RR);
18 -  title('Yellow');
19
20 -  subplot(2,2,3);
21 -  imshow(GG);
22 -  title('Cyan');
23
24 -  subplot(2,2,4);
25 -  imshow(BB);
26 -  title('Magenta');
```



3. Display Color Image into HIS Component

Editor - D:\Marwadi\SEM-5\IP-lab\Prg\colorimg_3.m

colorimg_1.m | colorimg_2.m | colorimg_3.m

```
1  -    fprintf('92000103073-Raj Chhadia');
2  -    I = imread('peppers.png');
3  -    hsv = rgb2hsv(I);
4  -    h = hsv(:,:,1);
5  -    s = hsv(:,:,2);
6  -    v = hsv(:,:,3);
7  -    figure
8  -    subplot(2,2,1);
9  -    imshow(I);
10 -    title('original image');
11
12 -    subplot(2,2,2);
13 -    imshow(h);
14 -    title('Hue');
15
16 -    subplot(2,2,3);
17 -    imshow(s);
18 -    title('Saturation');
19
20 -    subplot(2,2,4);
21 -    imshow(v);
22 -    title('Intensity');
```