CSE3018 : Content Based Image and Video Retrieval

Lab - 4

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1. CBIR system that uses features derived from Color Histogram Descriptors using **RGB Image**

CODE : Input yellow10.jpg

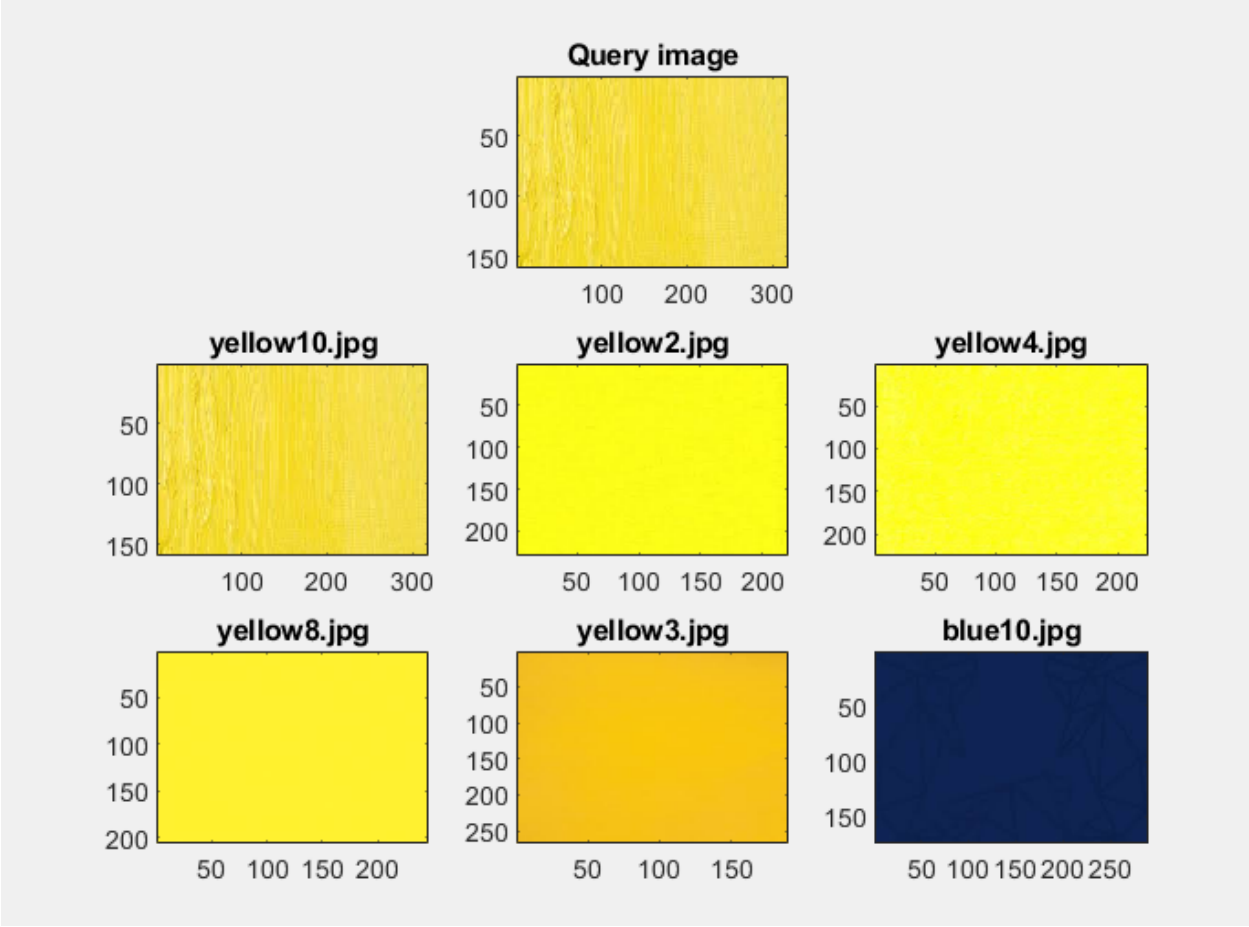
```
D = './images';
S = dir(fullfile(D,'*.jpg')); % pattern to match filenames.
query_image = imread('images/yellow10.jpg');
q_red = single(query_image(:,:,1));
q_green = single(query_image(:,:,2));
q_blue = single(query_image(:,:,3));
[Qbinval_red,Qbinloc_red] = imhist(q_red);
[Qbinval_green,Qbinloc_green] = imhist(q_green);
[Qbinval_blue,Qbinloc_blue] = imhist(q_blue);
Q_row={'garbage'};
for i=1:numel(Qbinval_red)
     Q_row{end+1} = Qbinval_red(i);
end
for i=1:numel(Qbinval_green)
     Q_row{end+1} = Qbinval_green(i);
end
for i=1:numel(Qbinval_blue)
     Q_row{end+1} = Qbinval_blue(i);
```

```
end


%creating first row - column names - of excel sheet
names = {'file_name'};
for i=0:255
names{end+1} = sprintf('%s%d', 'Red Color Bin ', i);
end
for i=0:255
names{end+1} = sprintf('%s%d', 'Green Color Bin ', i);
end
for i=0:255
names{end+1} = sprintf('%s%d', 'Blue Color Bin ', i);
end
names{end+1} = 'city block dist';
info_table = cell2table(cell(0, 770), 'VariableNames',names);
for k = 1:numel(S)
     F = fullfile(D,S(k).name);
     I = imread(F);
     S(k).data = I;
     red = single(I(:, : , 1));
     green = single(I(:, :, 2));
     blue = single(I(:, :, 3));
     [binval_red,binloc_red] = imhist(red);
     [binval_green,binloc_green] = imhist(green);
     [binval_blue,binloc_blue] = imhist(blue);
     I_row={S(k).name};
```

```
for i=1:numel(binval_red)
      I_row{end+1} = binval_red(i);
      end
      for i=1:numel(binval_green)
      I_row{end+1} = binval_green(i);
      end
      for i=1:numel(binval_blue)
      I_row{end+1} = binval_blue(i);
      end
      cbd=0;
      %size(I_row)
      for i=2:numel(Q_row)
      diff = Q_row{i}-I_row{i};
      cbd = cbd + abs(diff);
      end
      I_row{end+1} = cbd;
      info_table = [info_table;I_row];
end
info_table = sortrows(fillmissing(info_table, 'previous'), 'city
block dist');
writetable(info_table, 'lab4_1.xlsx','Sheet',1)


% Displaying the first 5 nearest image
subplot(3, 3, 2);
imagesc(query_image);
title('Query image');
file_names = info_table(:, 'file_name').file_name; % Extracting the
filenames of the images
```

```
for i = 1:6
      F = fullfile(D,char(file_names(i)));
      I = imread(F);
      subplot(3, 3, i+3);
      imagesc(I);
      title(char(file_names(i)));
end
```

OUTPUT :



Bin Values and city block distance are stored in Excel Sheet in Sheet 1

2. CBIR system that uses features derived from Color Histogram Descriptors using **HSV/HIS Image**

CODE : Input - blue10.jpg

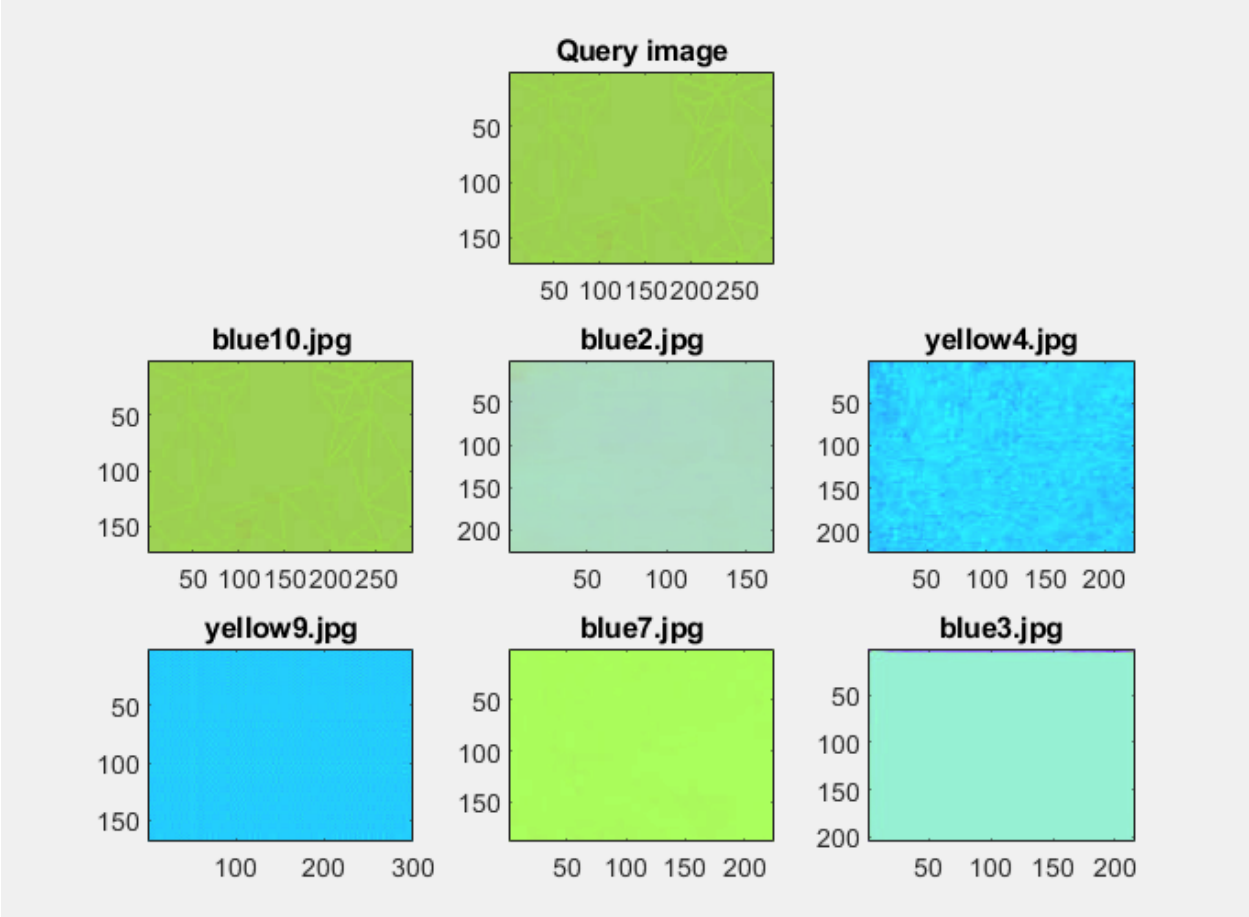
```
D = './images';
S = dir(fullfile(D,'*.jpg')); % pattern to match filenames.
query_image = imread('images/blue10.jpg');
query_image = rgb2hsv(query_image);
q_red = single(query_image(:,:,1));
q_green = single(query_image(:,:,2));
q_blue = single(query_image(:,:,3));
[Qbinval_red,Qbinloc_red] = imhist(q_red);
[Qbinval_green,Qbinloc_green] = imhist(q_green);
[Qbinval_blue,Qbinloc_blue] = imhist(q_blue);
Q_row={'garbage'};
for i=1:numel(Qbinval_red)
     Q_row{end+1} = Qbinval_red(i);
end
for i=1:numel(Qbinval_green)
     Q_row{end+1} = Qbinval_green(i);
end
for i=1:numel(Qbinval_blue)
     Q_row{end+1} = Qbinval_blue(i);
End
```

```
%creating first row - column names - of excel sheet
names = {'file_name'};
for i=0:255
names{end+1} = sprintf('%s%d', 'Red Color Bin ', i);
end
for i=0:255
names{end+1} = sprintf('%s%d', 'Green Color Bin ', i);
end
for i=0:255
names{end+1} = sprintf('%s%d', 'Blue Color Bin ', i);
end
names{end+1} = 'city block dist';
info_table = cell2table(cell(0, 770), 'VariableNames',names);
for k = 1:numel(S)
     F = fullfile(D,S(k).name);
     I = imread(F);
     I = rgb2hsv(I);
     S(k).data = I;
     red = single(I(:, : , 1));
     green = single(I(:, :, 2));
     blue = single(I(:, :, 3));
     [binval_red,binloc_red] = imhist(red);
     [binval_green,binloc_green] = imhist(green);
     [binval_blue,binloc_blue] = imhist(blue);
     I_row={S(k).name};
```

```
for i=1:numel(binval_red)
     I_row{end+1} = binval_red(i);
end
for i=1:numel(binval_green)
     I_row{end+1} = binval_green(i);
end
for i=1:numel(binval_blue)
     I_row{end+1} = binval_blue(i);
end
     cbd=0;
for i=2:numel(Q_row)
     diff = Q_row{i}-I_row{i};
     cbd = cbd + abs(diff);
end
     I_row{end+1} = cbd;
     info_table = [info_table;I_row];
end
info_table = sortrows(fillmissing(info_table, 'previous'), 'city
block dist');
writetable(info_table, 'lab4_1.xlsx','Sheet',2)


% Displaying the first 5 nearest image
subplot(3, 3, 2);
imagesc(query_image);
title('Query image');
file_names = info_table(:, 'file_name').file_name; % Extracting the
filenames of the images
```

```
for i = 1:6
      F = fullfile(D,char(file_names(i)));
      I = imread(F);
      I = rgb2hsv(I);
      subplot(3, 3, i+3);
      imagesc(I);
      title(char(file_names(i)));
end
```

OUTPUT :



Bin Values and City Block Distance data are stored in Excel Sheet in Sheet 2

3. CBIR system that uses features derived from Color Histogram Descriptors using **Grayscale Image**

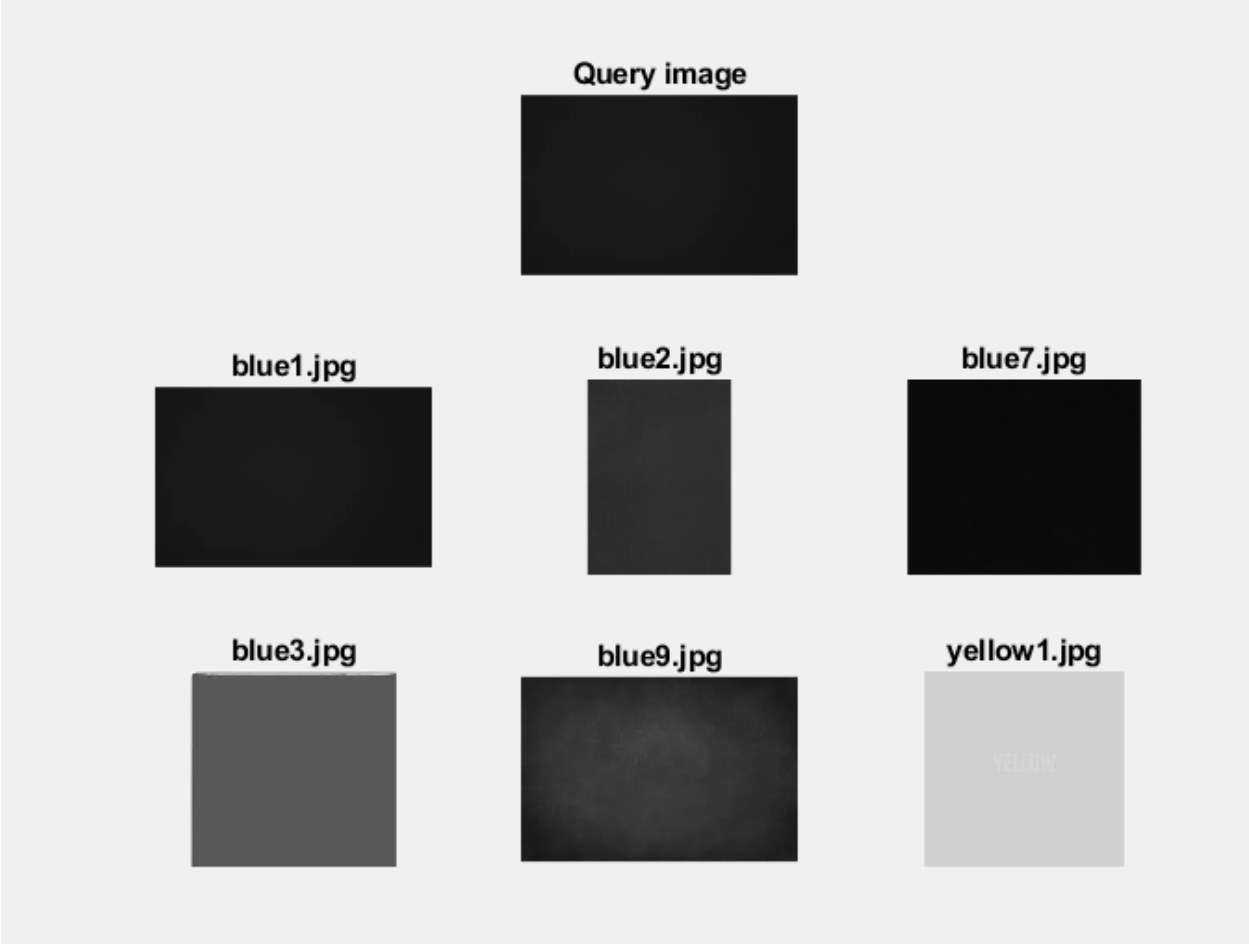
CODE : Input - blue1.jpg

```
D = './images';

S = dir(fullfile(D,'*.jpg')); % pattern to match filenames.

query_image = imread('images/blue1.jpg');

query_image = rgb2gray(query_image);

[Qbinval_red,Qbinloc_red] = imhist(query_image);

Q_row={'garbage'};

for i=1:numel(Qbinval_red)

        Q_row{end+1} = Qbinval_red(i);

end

%creating first row - column names - of excel sheet

names = {'file_name'};

for i=0:255

names{end+1} = sprintf('%s%d', 'Bin ', i);

end

names{end+1} = 'city block dist';

info_table = cell2table(cell(0, 258), 'VariableNames',names);
```

```
% Looping through all the images in the directory
for k = 1:numel(S)
        F = fullfile(D,S(k).name);
        I = imread(F);
        I = rgb2gray(I);
        S(k).data = I;
        [binval_red,binloc_red] = imhist(I);
        I_row={S(k).name};
        for i=1:numel(binval_red)
                I_row{end+1} = binval_red(i);
        end
        cbd=0;
        for i=2:numel(Q_row)
                diff = Q_row{i}-I_row{i};
                cbd = cbd + abs(diff);
        end
        I_row{end+1} = cbd;
        info_table = [info_table;I_row];
End
```

```
info_table = sortrows(fillmissing(info_table, 'previous'), 'city block dist');

writetable(info_table, 'lab4_1.xlsx','Sheet',3)

subplot(3, 3, 2);

imshow(query_image);

title('Query image');

file_names = info_table(:, 'file_name').file_name; % Extracting the filenames of the images

for i = 1:6

        F = fullfile(D,char(file_names(i)));

        I = imread(F);

        I = rgb2gray(I);

        subplot(3, 3, i+3);

        imshow(I);

        title(char(file_names(i)));

end
```

OUTPUT :



Bin Values and City Block Distance present in Excel Sheet in Sheet 3