Group Number 15

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Matlab Section ECE2409_001

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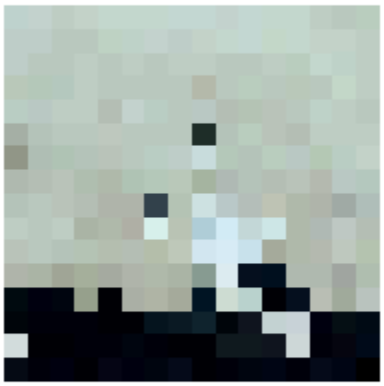
Example of image 16x16 airplane pixelated to use in presentation

```
%Hope
for s=1
    g=[];
 for k=5 %pick frame inside cover
     if k<10
         T={'airplane0'};
     else
         T={'airplane'};
     end
         a=imread([T{s},int2str(k),'.tif']);
         img=a;
 for j=1:16
     for i=1:16
         A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
```

```
            rimg=reshape(A,[],3);

            [uA,~,uIdx]=unique(rimg,'rows','stable');
            modeIdx=mode(uIdx);
            modeRow=uA(modeIdx,:);
            whereIdx=find(uIdx==modeIdx);
            g=[g;modeRow];
        end
    end
    end
    zz=reshape(g,16,16,3);
    figure
    f1=image(zz);
    axis('square');
    set(gcf,'Position',[134 337 560 420]);
    subplot(121)
    imshow(a)
    subplot(122)
    imshow(double(zz)./255)
end
```



River training to get averages of rgb for 16x16 common color image

```
%Hope
```

```
%Go to directory and get all river images
direction='./river/';
riverdir=dir([direction '*.tif']);
% m variable specifies which images to choose from and runs them
 through
% the loop
for m=1:30
        g=[];
        t=strcat(direction,riverdir(m).name);
        a=imread(t);
        img=a;
% loop to get 16x16 image and choose most common color
 for j=1:16
     for i=1:16
         A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
         rimg=reshape(A,[],3);

         [uA,~,uIdx]=unique(rimg,'rows','stable');
         modeIdx=mode(uIdx);
         modeRow=uA(modeIdx,:);
         whereIdx=find(uIdx==modeIdx);
         g=[g;modeRow];


     end
 end

  %fprintf("%d\n", sum(g(:)))
end
averageriver=92397;
fprintf("average rgb river images: %d\n", averageriver);
```

```
average rgb river images: 92397
```

Airplane training to get averages of rgb for 16x16 common color image

```
%Hope
direction='./airplane/';
airplanedir=dir([direction '*.tif']);
for m=78:99
        b=[];
        t=strcat(direction,airplanedir(m).name);
        a=imread(t);
        img=a;
 for j=1:16
     for i=1:16
         A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
         rimg=reshape(A,[],3);

         [uA,~,uIdx]=unique(rimg,'rows','stable');
```

```
        modeIdx=mode(uIdx);
        modeRow=uA(modeIdx,:);
        whereIdx=find(uIdx==modeIdx);
        b=[b;modeRow];


    end
end



%fprintf("%d\n", sum(b(:)))


end

averageairplane=105844;
fprintf("average rgb airplane images: %d\n", averageairplane);
```

```
average rgb airplane images: 105844
```

Baseball Diamond training to get averages of rgb for 16x16 common color image

```
%Hope
direction='./baseballdiamond/';
bballdir=dir([direction '*.tif']);
for m=1:15
        c=[];
        t=strcat(direction,bballdir(m).name);
        a=imread(t);
        img=a;
 for j=1:16
    for i=1:16
        A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
        rimg=reshape(A,[],3);

        [uA,~,uIdx]=unique(rimg,'rows','stable');
        modeIdx=mode(uIdx);
        modeRow=uA(modeIdx,:);
        whereIdx=find(uIdx==modeIdx);
        c=[c;modeRow];


    end
 end



%fprintf("%d\n", sum(c(:)))
```

```
end

averagebaseball=72889;
fprintf("average rgb baseball diamond images: %d\n", averagebaseball);
```

```
average rgb baseball diamond images: 72889
```

Beach training to get averages of rgb for 16x16 common color image

```
direction='./beach/';
beachdir=dir([direction '*.tif']);
 for m=59:99
         d=[];
         t=strcat(direction,beachdir(m).name);
         a=imread(t);
         img=a;
 for j=1:16
     for i=1:16
         A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
         rimg=reshape(A,[],3);

         [uA,~,uIdx]=unique(rimg,'rows','stable');
         modeIdx=mode(uIdx);
         modeRow=uA(modeIdx,:);
         whereIdx=find(uIdx==modeIdx);
         d=[d;modeRow];


     end
 end



 %fprintf("%d\n", sum(d(:)))

 end

 averagebeach=130932;
 fprintf("average rgb beach images: %d\n", averagebeach);
```

```
average rgb beach images: 130932
```

Harbor training to get averages of rgb for 16x16 common color image

```
direction='./harbor/';
harbordir=dir([direction '*.tif']);
for m=1:43
         e=[];
         t=strcat(direction,harbordir(m).name);
```

```
        a=imread(t);
        img=a;
 for j=1:16
     for i=1:16
        A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
        rimg=reshape(A,[],3);

        [uA,~,uIdx]=unique(rimg,'rows','stable');
        modeIdx=mode(uIdx);
        modeRow=uA(modeIdx,:);
        whereIdx=find(uIdx==modeIdx);
        e=[e;modeRow];
     end
 end
 % fprintf("%d\n", sum(e(:)))

end
averageharbor=77408;
fprintf("average rgb harbor images: %d\n", averageharbor);
```

```
average rgb harbor images: 77408
```

Run beach images 1-51 and test to see what they identify as when compared to the averages found previously

```
%Hope

% Set the counts to zero to get average later
rivercount=0;
airplanecount=0;
bballcount=0;
beachcount=0;
harborcount=0;
% Go to beach directory and get all the images
direction='./beach/';
beachdir=dir([direction '*.tif']);
% For loop to go through images
for m=1:51
        f=[];
        t=strcat(direction,beachdir(m).name);
        a=imread(t);
        img=a;
 % For loop to get 16x16 and most common color
 for j=1:16
     for i=1:16
        A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
        rimg=reshape(A,[],3);

        [uA,~,uIdx]=unique(rimg,'rows','stable');
        modeIdx=mode(uIdx);
```

```
            modeRow=uA(modeIdx,:);
            whereIdx=find(uIdx==modeIdx);
            f=[f;modeRow];


        end
    end

%Differences calculated
%fprintf("rgb sum unknown = %d\n", sum(f(:)));
riverfinalcount=abs(averageriver-sum(f(:)));
airplanefinalcount=abs(averageairplane-sum(f(:)));
baseballfinalcount=abs(averagebaseball-sum(f(:)));
beachfinalcount=abs(averagebeach-sum(f(:)));
harborfinalcount=abs(averageharbor-sum(f(:)));

% Whichever difference is the smallest between the average and unknown
% image a count will be added to index
[xmin,ind]=min([riverfinalcount,
 airplanefinalcount,baseballfinalcount,beachfinalcount,harborfinalcount]);
if ind==1
    fprintf('Unknown image is a river\n')
    rivercount=rivercount+1;
elseif ind==2
    fprintf('Unknown image is an airplane\n')
    airplanecount=airplanecount+1;
elseif ind==3
    fprintf('Unknown image is a baseball diamond\n')
    bballcount=bballcount+1;
elseif ind==4
    fprintf('Unknown image is a beach\n')
    beachcount=beachcount+1;
elseif ind==5
    fprintf('Unknown image is a harbor\n')
    harborcount=harborcount+1;

end
end
% Percentage to see how accurate the beach images predicted were
beachpercentage=(beachcount)/(beachcount+rivercount+airplanecount
+bballcount+harborcount);
fprintf("Average of correctness for a beach image being correctly
 identified %f\n",beachpercentage);
```

```
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is a river
Unknown image is an airplane
Unknown image is a river
Unknown image is an airplane
```

```
Unknown image is an airplane
Unknown image is a beach
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is a beach
Unknown image is a beach
Unknown image is an airplane
Unknown image is a river
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is an airplane
Unknown image is an airplane
Unknown image is a beach
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is a beach
Unknown image is an airplane
Unknown image is a beach
Unknown image is a beach
Unknown image is a beach
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is a river
Unknown image is an airplane
Unknown image is a river
Unknown image is an airplane
Unknown image is an airplane
Unknown image is an airplane
Unknown image is a river
Unknown image is an airplane
Average of correctness for a beach image being correctly identified
 0.392157
```

Run river images 33-83(50samples) and see what they identify as when compared to the averages found previously

```
%Hope

rivercount=0;
```

```
airplanecount=0;
bballcount=0;
beachcount=0;
harborcount=0;

direction='./river/';
riverdir=dir([direction '*.tif']);
for m=33:83
         f=[];
         t=strcat(direction,riverdir(m).name);
         a=imread(t);
         img=a;
 for j=1:16
     for i=1:16
         A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
         rimg=reshape(A,[],3);

         [uA,~,uIdx]=unique(rimg,'rows','stable');
         modeIdx=mode(uIdx);
         modeRow=uA(modeIdx,:);
         whereIdx=find(uIdx==modeIdx);
         f=[f;modeRow];
     end
 end

%fprintf("rgb sum unknown = %d\n", sum(f(:)));
riverfinalcount=abs(averageriver-sum(f(:)));
airplanefinalcount=abs(averageairplane-sum(f(:)));
baseballfinalcount=abs(averagebaseball-sum(f(:)));
beachfinalcount=abs(averagebeach-sum(f(:)));
harborfinalcount=abs(averageharbor-sum(f(:)));

% Whichever difference is the smallest between the average and unknown
% image a count will be added to index
[xmin,ind]=min([riverfinalcount,
 airplanefinalcount,baseballfinalcount,beachfinalcount,harborfinalcount]);
if ind==1
    fprintf('Unknown image is a river\n')
    rivercount=rivercount+1;
elseif ind==2
    fprintf('Unknown image is an airplane\n')
    airplanecount=airplanecount+1;
elseif ind==3
    fprintf('Unknown image is a baseball diamond\n')
    bballcount=bballcount+1;
elseif ind==4
    fprintf('Unknown image is a beach\n')
    beachcount=beachcount+1;
elseif ind==5
    fprintf('Unknown image is a harbor\n')
    harborcount=harborcount+1;


end
```

```
end


riverpercentage=(rivercount)/(rivercount+beachcount+airplanecount
+bballcount+harborcount);
fprintf("Average of correctness for a river image being correctly
 identified %f\n",riverpercentage);
```

```
Unknown image is a river
Unknown image is a river
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a harbor
Unknown image is a baseball diamond
Unknown image is a river
Unknown image is a harbor
Unknown image is a harbor
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a harbor
Unknown image is a river
Unknown image is a river
Unknown image is an airplane
Unknown image is a river
Unknown image is a harbor
Unknown image is a river
Unknown image is a river
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a baseball diamond
Unknown image is a river
Unknown image is a harbor
Unknown image is a river
Unknown image is a river
Unknown image is a harbor
Unknown image is a harbor
Unknown image is a river
Unknown image is a river
Unknown image is a harbor
Unknown image is a baseball diamond
```

```
Unknown image is a baseball diamond
Unknown image is a harbor
Unknown image is a harbor
Unknown image is a harbor
Unknown image is an airplane
Average of correctness for a river image being correctly identified
 0.254902
```

Run airplane images 1-51 and see what they identify as when compared to the averages found previously

```
rivercount=0;
airplanecount=0;
bballcount=0;
beachcount=0;
harborcount=0;

direction='./airplane/';
airplanedir=dir([direction '*.tif']);
for m=1:51
         f=[];
         t=strcat(direction,airplanedir(m).name);
         a=imread(t);
         img=a;
 for j=1:16
     for i=1:16
         A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
         rimg=reshape(A,[],3);

         [uA,~,uIdx]=unique(rimg,'rows','stable');
         modeIdx=mode(uIdx);
         modeRow=uA(modeIdx,:);
         whereIdx=find(uIdx==modeIdx);
         f=[f;modeRow];


     end
 end



fprintf("rgb sum unknown = %d\n", sum(f(:)));
riverfinalcount=abs(averageriver-sum(f(:)));
airplanefinalcount=abs(averageairplane-sum(f(:)));
baseballfinalcount=abs(averagebaseball-sum(f(:)));
beachfinalcount=abs(averagebeach-sum(f(:)));
harborfinalcount=abs(averageharbor-sum(f(:)));

% Whichever difference is the smallest between the average and unknown
% image a count will be added to index
```

```
[xmin,ind]=min([riverfinalcount,
 airplanefinalcount,baseballfinalcount,beachfinalcount,harborfinalcount]);
if ind==1
    fprintf('Unknown image is a river\n')
    rivercount=rivercount+1;
elseif ind==2
    fprintf('Unknown image is an airplane\n')
    airplanecount=airplanecount+1;
elseif ind==3
    fprintf('Unknown image is a baseball diamond\n')
    bballcount=bballcount+1;
elseif ind==4
    fprintf('Unknown image is a beach\n')
    beachcount=beachcount+1;
elseif ind==5
    fprintf('Unknown image is a harbor\n')
    harborcount=harborcount+1;

end

end

airplanepercentage=(airplanecount)/(airplanecount+beachcount
+rivercount+bballcount+harborcount);
fprintf("Average of correctness for a airplane image being correctly
 identified %f\n",airplanepercentage);
```

```
rgb sum unknown = 127330
Unknown image is a beach
rgb sum unknown = 115265
Unknown image is an airplane
rgb sum unknown = 115265
Unknown image is an airplane
rgb sum unknown = 131361
Unknown image is a beach
rgb sum unknown = 130757
Unknown image is a beach
rgb sum unknown = 118127
Unknown image is an airplane
rgb sum unknown = 121136
Unknown image is a beach
rgb sum unknown = 134803
Unknown image is a beach
rgb sum unknown = 114843
Unknown image is an airplane
rgb sum unknown = 110939
Unknown image is an airplane
rgb sum unknown = 104800
Unknown image is an airplane
rgb sum unknown = 73559
Unknown image is a baseball diamond
rgb sum unknown = 132415
Unknown image is a beach
rgb sum unknown = 120524
```

```
Unknown image is a beach
rgb sum unknown = 62129
Unknown image is a baseball diamond
rgb sum unknown = 108985
Unknown image is an airplane
rgb sum unknown = 99976
Unknown image is an airplane
rgb sum unknown = 71980
Unknown image is a baseball diamond
rgb sum unknown = 76981
Unknown image is a harbor
rgb sum unknown = 130686
Unknown image is a beach
rgb sum unknown = 127152
Unknown image is a beach
rgb sum unknown = 108802
Unknown image is an airplane
rgb sum unknown = 131705
Unknown image is a beach
rgb sum unknown = 104641
Unknown image is an airplane
rgb sum unknown = 141930
Unknown image is a beach
rgb sum unknown = 130345
Unknown image is a beach
rgb sum unknown = 82147
Unknown image is a harbor
rgb sum unknown = 104948
Unknown image is an airplane
rgb sum unknown = 109396
Unknown image is an airplane
rgb sum unknown = 107155
Unknown image is an airplane
rgb sum unknown = 91940
Unknown image is a river
rgb sum unknown = 92630
Unknown image is a river
rgb sum unknown = 115511
Unknown image is an airplane
rgb sum unknown = 126961
Unknown image is a beach
rgb sum unknown = 113355
Unknown image is an airplane
rgb sum unknown = 129646
Unknown image is a beach
rgb sum unknown = 127004
Unknown image is a beach
rgb sum unknown = 102215
Unknown image is an airplane
rgb sum unknown = 136593
Unknown image is a beach
rgb sum unknown = 116365
Unknown image is an airplane
rgb sum unknown = 121983
```

```
Unknown image is a beach
rgb sum unknown = 81837
Unknown image is a harbor
rgb sum unknown = 58589
Unknown image is a baseball diamond
rgb sum unknown = 70038
Unknown image is a baseball diamond
rgb sum unknown = 96792
Unknown image is a river
rgb sum unknown = 115510
Unknown image is an airplane
rgb sum unknown = 106882
Unknown image is an airplane
rgb sum unknown = 71709
Unknown image is a baseball diamond
rgb sum unknown = 104115
Unknown image is an airplane
rgb sum unknown = 107468
Unknown image is an airplane
rgb sum unknown = 101821
Unknown image is an airplane
Average of correctness for a airplane image being correctly identified
 0.431373
```

%% Run baseball images 47-93 and see what they identify as when compared to the averages found previously

```
rivercount=0;
airplanecount=0;
bballcount=0;
beachcount=0;
harborcount=0;

direction='./baseballdiamond/';
harbordir=dir([direction '*.tif']);
for m=47:93
        f=[];
        t=strcat(direction,harbordir(m).name);
        a=imread(t);
        img=a;

 for j=1:16
     for i=1:16
        A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
        rimg=reshape(A,[],3);

        [uA,~,uIdx]=unique(rimg,'rows','stable');
        modeIdx=mode(uIdx);
        modeRow=uA(modeIdx,:);
        whereIdx=find(uIdx==modeIdx);
```

```
            f=[f;modeRow];


        end
    end

fprintf("rgb sum unknown = %d\n", sum(f(:)));
riverfinalcount=abs(averageriver-sum(f(:)));
airplanefinalcount=abs(averageairplane-sum(f(:)));
baseballfinalcount=abs(averagebaseball-sum(f(:)));
beachfinalcount=abs(averagebeach-sum(f(:)));
harborfinalcount=abs(averageharbor-sum(f(:)));

% Whichever difference is the smallest between the average and unknown
% image a count will be added to index
[xmin,ind]=min([riverfinalcount,
 airplanefinalcount,baseballfinalcount,beachfinalcount,harborfinalcount]);
if ind==1
    fprintf('Unknown image is a river\n')
    rivercount=rivercount+1;
elseif ind==2
    fprintf('Unknown image is an airplane\n')
    airplanecount=airplanecount+1;
elseif ind==3
    fprintf('Unknown image is a baseball diamond\n')
    bballcount=bballcount+1;
elseif ind==4
    fprintf('Unknown image is a beach\n')
    beachcount=beachcount+1;
elseif ind==5
    fprintf('Unknown image is a harbor\n')
    harborcount=harborcount+1;

end

end

bballpercentage=(bballcount)/(beachcount+rivercount+bballcount
+harborcount+airplanecount);
fprintf("Average of correctness for a baseball diamond image being
 correctly identified %f percent\n",bballpercentage);

rgb sum unknown = 114290
Unknown image is an airplane
rgb sum unknown = 121091
Unknown image is a beach
rgb sum unknown = 100993
Unknown image is an airplane
rgb sum unknown = 105714
Unknown image is an airplane
rgb sum unknown = 106263
Unknown image is an airplane
rgb sum unknown = 107066
Unknown image is an airplane
```

```
rgb sum unknown = 97033
Unknown image is a river
rgb sum unknown = 78802
Unknown image is a harbor
rgb sum unknown = 78504
Unknown image is a harbor
rgb sum unknown = 69509
Unknown image is a baseball diamond
rgb sum unknown = 67024
Unknown image is a baseball diamond
rgb sum unknown = 72149
Unknown image is a baseball diamond
rgb sum unknown = 64027
Unknown image is a baseball diamond
rgb sum unknown = 120572
Unknown image is a beach
rgb sum unknown = 114018
Unknown image is an airplane
rgb sum unknown = 109067
Unknown image is an airplane
rgb sum unknown = 111228
Unknown image is an airplane
rgb sum unknown = 106420
Unknown image is an airplane
rgb sum unknown = 109736
Unknown image is an airplane
rgb sum unknown = 103923
Unknown image is an airplane
rgb sum unknown = 60397
Unknown image is a baseball diamond
rgb sum unknown = 62204
Unknown image is a baseball diamond
rgb sum unknown = 61651
Unknown image is a baseball diamond
rgb sum unknown = 64932
Unknown image is a baseball diamond
rgb sum unknown = 63667
Unknown image is a baseball diamond
rgb sum unknown = 66524
Unknown image is a baseball diamond
rgb sum unknown = 59812
Unknown image is a baseball diamond
rgb sum unknown = 59316
Unknown image is a baseball diamond
rgb sum unknown = 67250
Unknown image is a baseball diamond
rgb sum unknown = 52283
Unknown image is a baseball diamond
rgb sum unknown = 58019
Unknown image is a baseball diamond
rgb sum unknown = 55415
Unknown image is a baseball diamond
rgb sum unknown = 53814
Unknown image is a baseball diamond
```

```
rgb sum unknown = 95711
Unknown image is a river
rgb sum unknown = 100132
Unknown image is an airplane
rgb sum unknown = 93097
Unknown image is a river
rgb sum unknown = 93200
Unknown image is a river
rgb sum unknown = 95711
Unknown image is a river
rgb sum unknown = 92254
Unknown image is a river
rgb sum unknown = 93438
Unknown image is a river
rgb sum unknown = 110086
Unknown image is an airplane
rgb sum unknown = 95802
Unknown image is a river
rgb sum unknown = 85394
Unknown image is a river
rgb sum unknown = 97762
Unknown image is a river
rgb sum unknown = 105809
Unknown image is an airplane
rgb sum unknown = 88012
Unknown image is a river
rgb sum unknown = 87943
Unknown image is a river
Average of correctness for a baseball diamond image being correctly
 identified 0.361702 percent
```

%% Run river images 51-99 and see what they identify as when compared to the averages found previously

```
rivercount=0;
airplanecount=0;
bballcount=0;
beachcount=0;
harborcount=0;
direction='./harbor/';
harbordir=dir([direction '*.tif']);
for m=51:99
        f=[];
        t=strcat(direction,harbordir(m).name);
        a=imread(t);
        img=a;
 for j=1:16
     for i=1:16
        A=img((i-1)*16+1:(i-1)*16+16,(j-1)*16+1:(j-1)*16+16,:);
        rimg=reshape(A,[],3);
```

```
            [uA,~,uIdx]=unique(rimg,'rows','stable');
            modeIdx=mode(uIdx);
            modeRow=uA(modeIdx,:);
            whereIdx=find(uIdx==modeIdx);
            f=[f;modeRow];
        end
    end
fprintf("rgb sum unknown = %d\n", sum(f(:)));
riverfinalcount=abs(averageriver-sum(f(:)));
airplanefinalcount=abs(averageairplane-sum(f(:)));
baseballfinalcount=abs(averagebaseball-sum(f(:)));
beachfinalcount=abs(averagebeach-sum(f(:)));
harborfinalcount=abs(averageharbor-sum(f(:)));
% Whichever difference is the smallest between the average and unknown
% image a count will be added to index
[xmin,ind]=min([riverfinalcount,
 airplanefinalcount,baseballfinalcount,beachfinalcount,harborfinalcount]);
if ind==1
    fprintf('Unknown image is a river\n')
    rivercount=rivercount+1;
elseif ind==2
    fprintf('Unknown image is an airplane\n')
    airplanecount=airplanecount+1;
elseif ind==3
    fprintf('Unknown image is a baseball diamond\n')
    bballcount=bballcount+1;
elseif ind==4
    fprintf('Unknown image is a beach\n')
    beachcount=beachcount+1;
elseif ind==5
    fprintf('Unknown image is a harbor\n')
    harborcount=harborcount+1;

end
end

harborpercentage=(harborcount)/(beachcount+rivercount+bballcount
+harborcount+airplanecount);
fprintf("Percentage of a harbor image being correctly identified %f
 \n",harborpercentage);

rgb sum unknown = 129072
Unknown image is a beach
rgb sum unknown = 132825
Unknown image is a beach
rgb sum unknown = 121587
Unknown image is a beach
rgb sum unknown = 80595
Unknown image is a harbor
rgb sum unknown = 82764
Unknown image is a harbor
rgb sum unknown = 89450
Unknown image is a river
```

```
rgb sum unknown = 101785
Unknown image is an airplane
rgb sum unknown = 110813
Unknown image is an airplane
rgb sum unknown = 94555
Unknown image is a river
rgb sum unknown = 102904
Unknown image is an airplane
rgb sum unknown = 103021
Unknown image is an airplane
rgb sum unknown = 146009
Unknown image is a beach
rgb sum unknown = 91012
Unknown image is a river
rgb sum unknown = 87735
Unknown image is a river
rgb sum unknown = 100261
Unknown image is an airplane
rgb sum unknown = 104560
Unknown image is an airplane
rgb sum unknown = 128865
Unknown image is a beach
rgb sum unknown = 111100
Unknown image is an airplane
rgb sum unknown = 100102
Unknown image is an airplane
rgb sum unknown = 95367
Unknown image is a river
rgb sum unknown = 94526
Unknown image is a river
rgb sum unknown = 94529
Unknown image is a river
rgb sum unknown = 94043
Unknown image is a river
rgb sum unknown = 91754
Unknown image is a river
rgb sum unknown = 97476
Unknown image is a river
rgb sum unknown = 95442
Unknown image is a river
rgb sum unknown = 102247
Unknown image is an airplane
rgb sum unknown = 104798
Unknown image is an airplane
rgb sum unknown = 102764
Unknown image is an airplane
rgb sum unknown = 101551
Unknown image is an airplane
rgb sum unknown = 100318
Unknown image is an airplane
rgb sum unknown = 96479
Unknown image is a river
rgb sum unknown = 35621
Unknown image is a baseball diamond
```

```
rgb sum unknown = 46978
Unknown image is a baseball diamond
rgb sum unknown = 52106
Unknown image is a baseball diamond
rgb sum unknown = 78802
Unknown image is a harbor
rgb sum unknown = 57309
Unknown image is a baseball diamond
rgb sum unknown = 23888
Unknown image is a baseball diamond
rgb sum unknown = 31144
Unknown image is a baseball diamond
rgb sum unknown = 36648
Unknown image is a baseball diamond
rgb sum unknown = 40212
Unknown image is a baseball diamond
rgb sum unknown = 75490
Unknown image is a harbor
rgb sum unknown = 76686
Unknown image is a harbor
rgb sum unknown = 66666
Unknown image is a baseball diamond
rgb sum unknown = 73151
Unknown image is a baseball diamond
rgb sum unknown = 73229
Unknown image is a baseball diamond
rgb sum unknown = 73459
Unknown image is a baseball diamond
rgb sum unknown = 52966
Unknown image is a baseball diamond
rgb sum unknown = 83978
Unknown image is a harbor
Percentage of a harbor image being correctly identified 0.122449
```

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