**PARKING LOT USING HUFFMAN CODING AND IMAGE PROCESSING**

Program:

data = imread('parkinglot.jpg');

diff\_im = imsubtract(data(:,:,2), rgb2gray(data));

%Use a median filter to filter out noise

diff\_im = medfilt2(diff\_im, [3 3]);

diff\_im = im2bw(diff\_im,0.18);

diff\_im = bwareaopen(diff\_im,300);

bw = bwlabel(diff\_im, 8);

stats = regionprops(bw, 'BoundingBox', 'Centroid');

% Display the image

imshow(data)

hold on

for object = 1:length(stats)

bb = stats(object).BoundingBox;

bc = stats(object).Centroid;

rectangle('Position',bb,'EdgeColor','r','LineWidth',2)

plot(bc(1),bc(2), '-m+')

end

a=1;

v=10;

q=2;

w=3;

x=1;

y=1;

z=3;

r4=0;

r5=1;

sg1=0;

sg2=0;

sg3=0;

sg4=0;

sg5=0;

s(1)=0;

s(2)=0;

s(3)=0;

s(4)=0;

s(5)=0;

while a==1

ans=input('Press 1 for new entry and press 0 to exit.');

if ans==1

vname= input('Enter name of visitor: ', 's');

pn = input('Enter visitor phone no.: ');

car = input('Enter car plate number: ');

person = input('Enter name of person to be visited: ', 's');

flat = input('Enter flat details: ');

slot = input('Enter parking slot required according to the layout shown:');

block = input('Enter building block number (1,2,3,4,5):');

v=v+1;

if block==1

q=q+1;

elseif block==2

w=w+1;

elseif block==3

x=x+1;

elseif block==4

y=y+1;

elseif block==5

z=z+1;

else

disp('Wrong block entered.')

end

elseif ans==0

d1= q/v;

d2= w/v;

d3= x/v;

d4= y/v;

d5= z/v;

d=[d1 d2 d3 d4 d5]

s=sort(d,'descend')

r4='0';r5='1';

if (s(4)+s(5))>=s(1)

for i=1:3

temp(i+1)=s(i);

end

temp(1)=(s(4)+s(5));

for i=1:4

s(i)=temp(i);

end

r2='0';r3='1';

if (s(3)+s(4))>=s(1)

for i=1:2

temp(i+1)=s(i);

end

temp(1)=(s(3)+s(4));

for i=1:3

s(i)=temp(i);

end

r1='1';r4='00';r5='01';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='01';r2='10';r3='11';r4='000';r5='001';

else s(2)=(s(2)+s(3));

r1='11';r2='00';r3='01';r4='100';r5='101';

end

elseif (s(3)+s(4))>=s(2)

temp(2)=s(2);s(2)=(s(3)+s(4));s(3)=temp(2);

r1='1';r2='00';r3='01';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='01';r2='000';r3='001';r4='10';r5='11';

else s(2)=(s(2)+s(3));

r1='11';r2='100';r3='101';r4='00';r5='01';

end

else s(3)=(s(3)+s(4));

r1='0';r2='10';r3='11';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='00';r2='010';r3='011';r4='10';r5='11';

else s(2)=(s(2)+s(3));

r1='10';r2='110';r3='111';r4='00';r5='01';

end

end

elseif (s(4)+s(5))>=s(2)

for i=2:3

temp(i+1)=s(i);

end

temp(2)=(s(4)+s(5));

for i=3:4

s(i)=temp(i);

end

r2='0';r3='1';

if (s(3)+s(4))>=s(1)

for i=1:2

temp(i+1)=s(i);

end

temp(1)=(s(3)+s(4));

for i=1:3

s(i)=temp(i);

end

r1='0';r4='10';r5='11';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='00';r2='10';r3='11';r4='010';r5='011';

else s(2)=(s(2)+s(3));

r1='10';r2='00';r3='01';r4='110';r5='111';

end

elseif (s(3)+s(4))>=s(2)

temp(2)=s(2);s(2)=(s(3)+s(4));s(3)=temp(2);

r1='1';r2='00';r3='01';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='01';r2='000';r3='001';r4='10';r5='11';

else s(2)=(s(2)+s(3));

r1='11';r2='100';r3='101';r4='00';r5='01';

end

else s(3)=(s(3)+s(4));

r2='10';r3='11';r4='00';r5='01';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='1';r2='010';r3='011';r4='000';r5='001';

else s(2)=(s(2)+s(3));

r1='0';r2='110';r3='111';r4='100';r5='101';

end

end

elseif (s(4)+s(5))>=s(3)

temp(3)=s(3);s(3)=(s(4)+s(5));s(4)=temp(3);

r4='00';r5='01';r3='1';

if (s(3)+s(4))>=s(1)

for i=1:2

temp(i+1)=s(i);

end

temp(1)=(s(3)+s(4));

for i=1:3

s(i)=temp(i);

end

r1='0';r2='1';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='00';r2='01';r3='11';r4='100';r5='101';

else s(2)=(s(2)+s(3));

r1='10';r2='11';r3='01';r4='000';r5='001';

end

elseif (s(3)+s(4))>=s(2)

temp(2)=s(2);s(2)=(s(3)+s(4));s(3)=temp(2);

r2='1';r3='01';r4='000';r5='001';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='1';r2='01';r3='001';r4='0000';r5='0001';

else s(2)=(s(2)+s(3));

r1='0';r2='11';r3='101';r4='1000';r5='1001';

end

else s(3)=(s(3)+s(4));

r2='0';r3='11';r4='100';r5='101';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='1';r2='00';r3='011';r4='0100';r5='0101';

else s(2)=(s(2)+s(3));

r1='0';r2='10';r3='111';r4='1100';r5='1101';

end

end

else s(4)=(s(4)+s(5));

r3='0';r4='10';r5='11';

if (s(3)+s(4))>=s(1)

for i=1:2

temp(i+1)=s(i);

end

temp(1)=(s(3)+s(4));

for i=1:3

s(i)=temp(i);

end

r1='0';r2='1';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='00';r2='01';r3='10';r4='110';r5='111';

else s(2)=(s(2)+s(3));

r1='10';r2='11';r3='00';r4='010';r5='011';

end

elseif (s(3)+s(4))>=s(2)

temp(2)=s(2);s(2)=(s(3)+s(4));s(3)=temp(2);

r2='1';r3='00';r4='010';r5='011';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='1';r2='01';r3='000';r4='0010';r5='0011';

else s(2)=(s(2)+s(3));

r1='0';r2='11';r3='100';r4='1010';r5='1011';

end

else s(3)=(s(3)+s(4));

r2='0';r3='10';r4='110';r5='111';

if (s(2)+s(3))>=s(1)

temp(1)=s(1);s(1)=(s(2)+s(3));s(2)=temp(1);

r1='1';r2='00';r3='010';r4='0110';r5='0111';

else s(2)=(s(2)+s(3));

r1='0';r2='10';r3='110';r4='1110';r5='1111';

end

end

end

disp('Program terminated.')

disp('Total number of visitors:')

disp(v)

disp('Total number of visitors at block 1:')

disp(q);

disp('Total number of visitors at block 2:');

disp(w);

disp('Total number of visitors at block 3:');

disp(x);

disp('Total number of visitors at block 4:');

disp(y);

disp('Total number of visitors at block 5:');

disp(z);

disp('ENCODED CODE:');

disp(r1);

disp(r2);

disp(r3);

disp(r4);

disp(r5);

break

else

disp('Invalid input.')

end

end