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SUBJECT : IVA

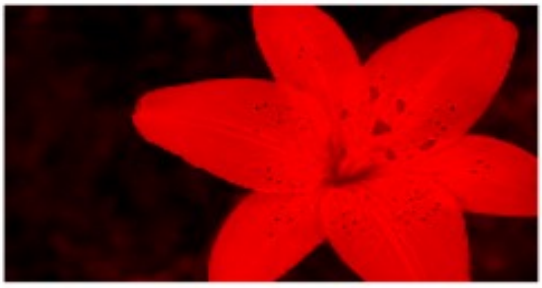
Programming Practice Assessment – MATLAB

1.MATLAB program to extract different Attributes of an Image.

```
%MATLAB program to extract image attributes.
clc;
clear all;
close all;
image1=imread('image.jfif');
size(image1) % to display dimensions of input image
image2=rgb2gray(image1);
subplot(2,2,4);
imshow(image2);
title('GRAYSCALE');
[r, c, d]=size(image1);
z=zeros(r,c);
tempr=image1;
tempr(:,:,2)=z;
tempr(:,:,3)=z;
subplot(2,2,1);
imshow(tempr);
title('RED');
tempg=image1;
tempg(:,:,1)=z;
tempg(:,:,3)=z;
subplot(2,2,2)
imshow(tempg);
title('GREEN');
tempb=image1;
tempb(:,:,1)=z;
tempb(:,:,2)=z;
subplot(2,2,3);
imshow(tempb);
title('BLUE');
```

OUTPUT:

RED



GREEN

BLUE

GRAY

2.MATLAB program to subplot different image

```
a=imread('image.jfif');
imshow(a)
imtool(a);
imshow(a);
b=imcrop(a,[159,163,492-159 362-163]);
imshow(b)
c=imresize(a,0.5);
imshow(c)
d=imrotate(a,75);
imshow(d)
subplot(2,2,1),imshow(a);
subplot(2,2,2),imshow(b);
subplot(2,2,3),imshow(c);
subplot(2,2,4),imshow(d);
imwrite(d,'target.png','png')
```

OUTPUT:

3.MATLAB program to sampling and quantization

Program illustrates false contouring using spatial resolution

```
clc
clear all
close all
a=imread('image.jfif');
subplot(3,2,1)
imshow(a)
title('original image')
%using 128 gray levels figure,
subplot(3,2,2)
imshow(grayslice(a,128),gray(128))
title('Image with 128 gray level')
%using 64 gray levels figure,
subplot(3,2,3)
imshow(grayslice(a,64),gray(64))
title('Image with 64 gray level')
%using 32 gray levels figure,
subplot(3,2,4)
imshow(grayslice(a,32),gray(32))
title('Image with 32 gray level')
%using 16 gray levels figure,
subplot(3,2,5)
imshow(grayslice(a,16),gray(16))
title('Image with 16 gray level')
%using 8 gray levels figure
subplot(3,2,6)
imshow(grayslice(a,8),gray(8))
title('Image with 8 gray level')
```

OUTPUT:

original image

Image with 128 gray level

Image with 64 gray level

Image with 32 gray level

Image with 16 gray level

Image with 8 gray level

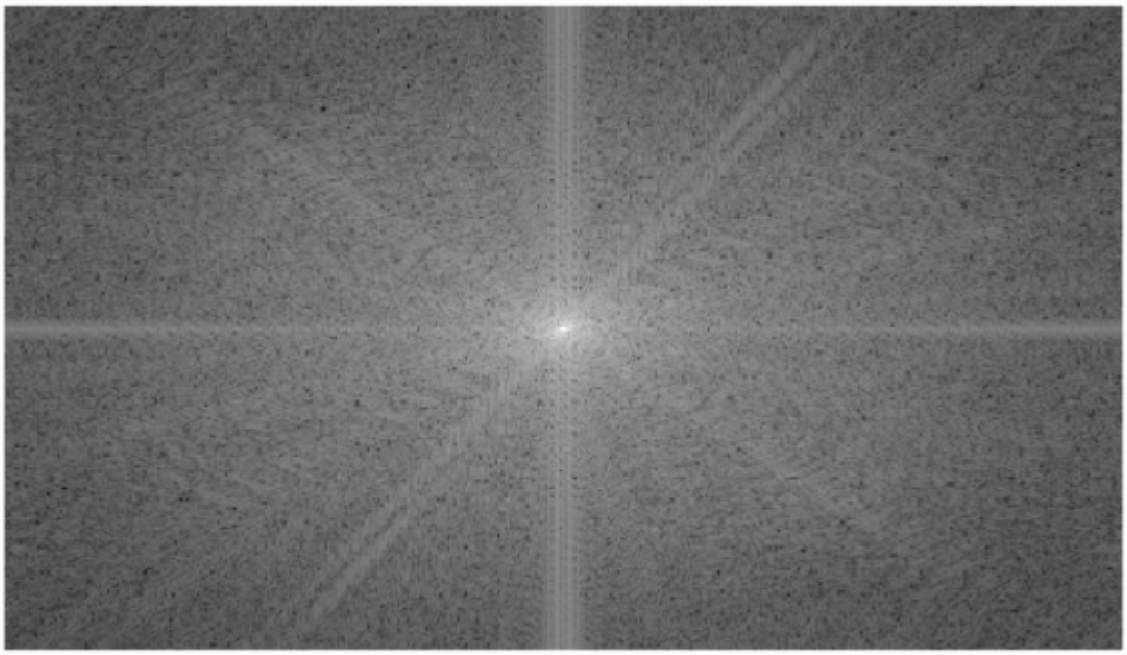
4.MATLAB Program for Fourier Transform Implementation

```
clear all;
close all;
img=imread('image.jfif');
figure('Name', "original image"); imshow(img);
gray_img=rgb2gray(img);
figure('Name','Gray Scale Image');imshow(gray_img);
F=fft2(gray_img);
figure('Name', 'Fourier Transform Image');imshow(F,[]);
Fsh=fftshift(F);
figure('Name','Center Fourier Transform Image');imshow(Fsh,[]);
log_img=log(1+Fsh);
figure('Name','Log Fourier Transform Image');imshow(log_img,[]);
F=ifftshift(Fsh);
f=ifft2(F);
Figure('Name','Reconstructed Image'); imshow(f,[]);

clear all
lose all
a=zeros(256);
[~,~]=size(a);
for i=110:140
 for j=110:140
    a(i,j)=255;
end
end
b=ones(256);
[m,n]=size(b);

for i=110:160
 for j=110:160
    b(i,j)=0;
end
end
c=conv2(a,b,'same');
a1=fft2(a);
b1=fft2(b);
c1=a1.*b1;
d1=fftshift(ifft2(c1));
imshow(c), figure,imshow(d1)
```

OUTPUT :

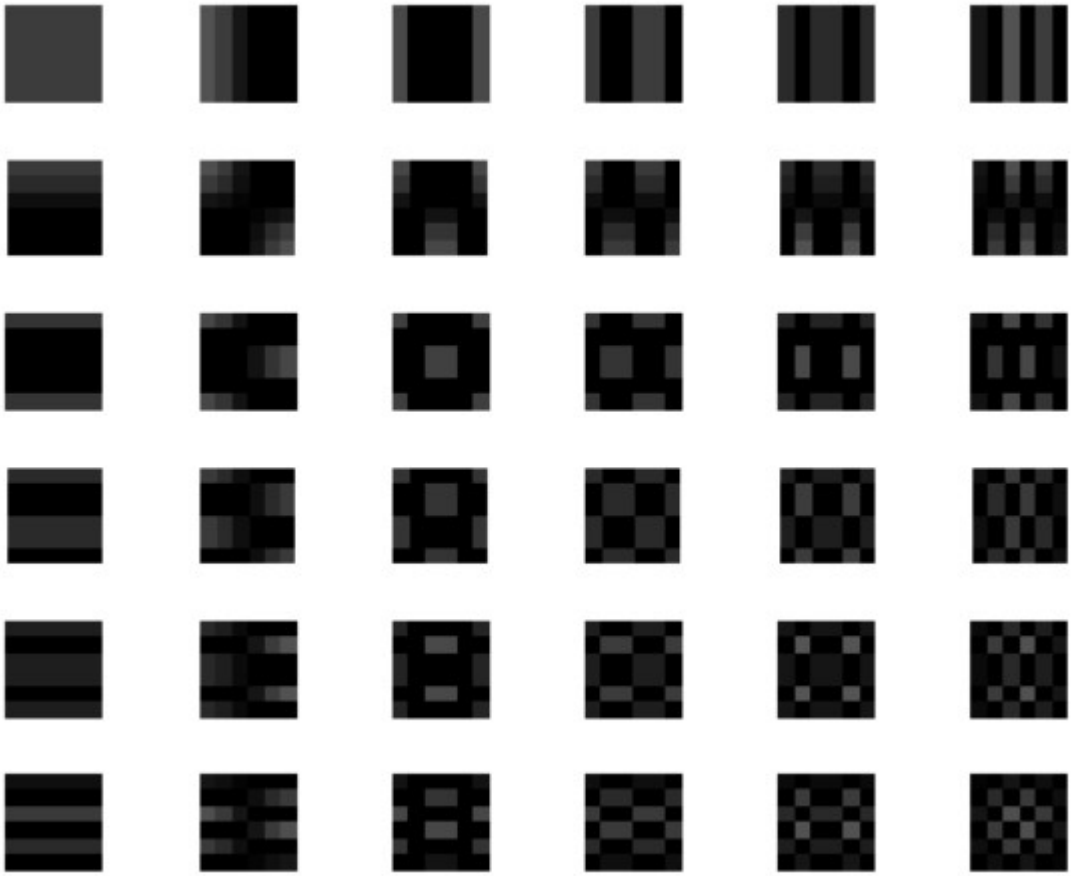


5.MATLAB Program to Calculate DCT Basis

```
%MATLAB program for DCT/IDCT computation.
clc;
clear all;
close all;
m=input('Enter the basis matrix dimension: '); % Request user input
n=m;

alpha2=ones(1,n)*sqrt(2/n);
alpha2(1)=sqrt(1/n);
alpha1=ones(1,m)*sqrt(2/m);
alpha(1)=sqrt(1/m); % square root.
for u=0:m-1
  for v=0:n-1
    for x=0:m-1
      for y=0:n-1
        a{u+1,v+1}(x+1,y+1)=alpha1(u+1)*alpha2(v+1)*...
        cos((2*x+1)*u*pi/(2*n))*cos((2*y+1)*v*pi/(2*n));
      end
    end
  end
end
mag=a;
figure(3) % Create figure graphics object
k=1;
% Code to plot the basis
for i=1:m
  for j=1:n
    subplot(m,n,k) % Create axes in tiled positions
    imshow(mag{i,j}) % Display image
    k=k+1;
  end
end
```

OUTPUT:



6.MATLAB Code to construct multi resolution image using DWT

```
clear all ; close all
x= imread ('image.jfif');
figure ; imshow(x) ;

[xar,xhr,xvr,xdr] = dwt2(x(:,:,1),'db2');
[xag,xhg,xvg,xdg] = dwt2(x(:,:,2),'db2');
[xab,xhb,xvb,xdb] = dwt2(x(:,:,3),'db2');

xa(:,:,1) = xar ; xa(:,:,2) = xag ; xa(:,:,3) = xab ;
xh(:,:,1) = xhr ; xh(:,:,2) = xhg ; xh(:,:,3) = xhb ;
xv(:,:,1) = xvr ; xv(:,:,2) = xvg ; xv(:,:,3) = xvb ;
xd(:,:,1) = xdr ; xd(:,:,2) = xdg ; xd(:,:,3) = xdb ;

figure, imshow(xa/255);
figure, imshow(xh);
figure, imshow(xv);
figure, imshow(xd);
X1 = [xa*0.03 log10(xv)*0.3 ; log(xh)*0.3 log10(xd)*03 ] ;
figure ; imshow(X1)

[xaar,xhhr,xvvr,xddr] = dwt2 (xa(:,:,1), 'db2') ;
[xaag,xhhg,xvvg,xddg] = dwt2 (xa(:,:,2), 'db2') ;
[xaab,xhhb,xvvb,xddb] = dwt2 (xa(:,:,3), 'db2') ;
xaa(:,:,1) = xaar ; xaa(:,:,2) = xaag ; xaa(:,:,3) =xaab ;
xhh(:,:,1) = xhhr ; xaa(:,:,2) = xhhg ; xhh(:,:,3) =xhhb ;
xvv(:,:,1) = xvvr ; xvv(:,:,2) = xvvg ; xvv(:,:,3) =xvvb ;
xdd(:,:,1) = xaar ; xdd(:,:,2) = xddg ; xdd(:,:,3) =xddb ;
figure,imshow(xaa/255);
figure,imshow(xhh) ;
figure,imshow(xvv);
```

OUTPUT: