**EE5356 -DIGITAL IMAGE PROCESSING**

**Project 1**

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**Zooming with interpolation:**

**Apply the following 3 interpolators to a test image (8bpp 256 level gray scale)**

**to zoom it by 2.**

1. **Replication (See Figure 7.28 in the textbook pp.254)**
2. **Linear interpolator (See Figure 7.29 in the textbook pp.255)**
3. **Cubic spline interpolator (See Figure 7.30 in the textbook pp.255)**

PROGRAM:

FUNCTION USED:

function B = zero\_interlace(ori)

a=0;

b=0;

[m,n]=size(ori);

k=2\*m;

l=2\*n;

B=zeros(k,l);

for i = 0: k-1

for j = 0:l-1

if rem(i,2) == 0

if rem(i+j,2) == 0

B(i+1,j+1) = ori(a+1,b+1);

if b+1 == n

a = a+1;

b = 0;

else

b = b+1;

end

end

end

end

end

MAIN PROGRAM:

clc;

clear all;

close all;

ori=imread('C:\Users\PAVAI ARCHIMEDES\Desktop\cameraman.bmp');

figure(1);

imshow(ori);

title('Original Image');

dow = zero\_interlace(ori);

H\_repl = [1 1;1 1];

zoom\_repl = conv2(dow,H\_repl);

figure(2);

imshow(uint8(zoom\_repl));

title(' Image by using replication');

H\_linear\_interpolation = [1/4 1/2 1/4;1/2 1 1/2;1/4 1/2 1/4];

zoom\_linear\_interpolation = conv2(dow,H\_linear\_interpolation);

figure(3);

imshow(uint8(zoom\_linear\_interpolation));

title(' Image by linear interpolation');

Bar = double(dow);

h = [1 1;1 1];

H = conv2(h,h);

H\_cubic = conv2(H,H);

d\_fac = max(max(H\_cubic));

H\_cubic = H\_cubic./d\_fac;

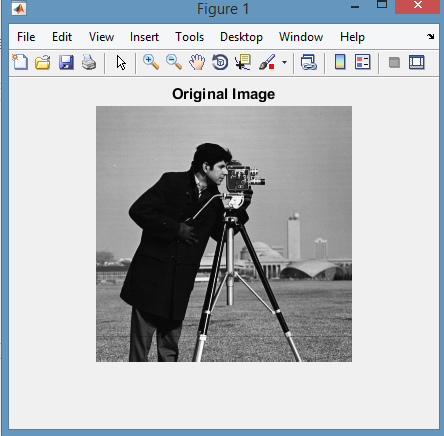
zoom\_cubic\_spline\_interpolation = conv2(H\_cubic,Bar);

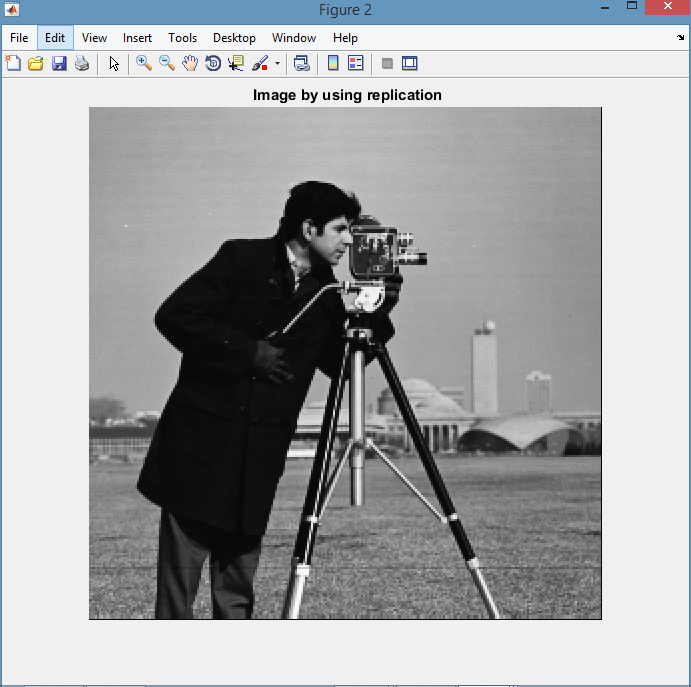
figure(4);

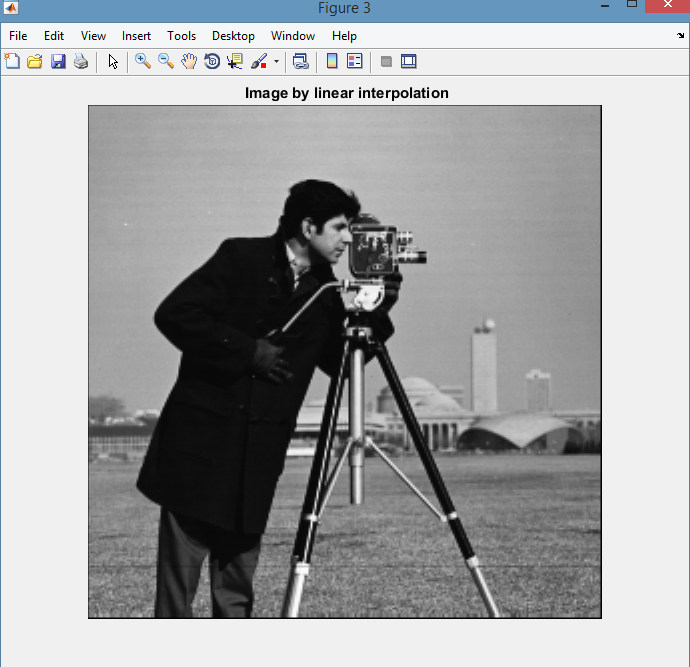
imshow(uint8(zoom\_cubic\_spline\_interpolation));

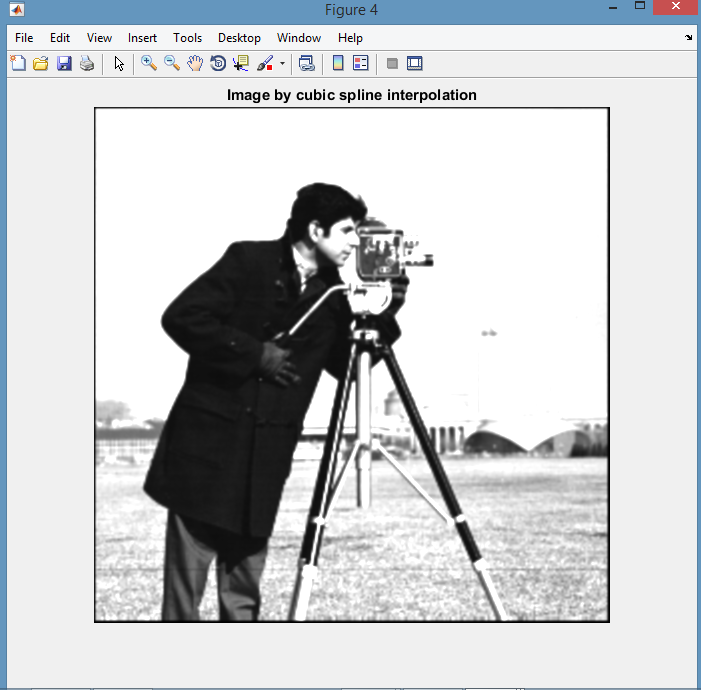
title('Image by cubic spline interpolation');

RESULTS:









CONCLUSION:

Hence all the zooming interpolation techniques has been applied to cameraman image.