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## ASSIGNMENT 0

**Problem** 1. Piazza:Write down whether you will be using Matlab or Python for your coding assignments.

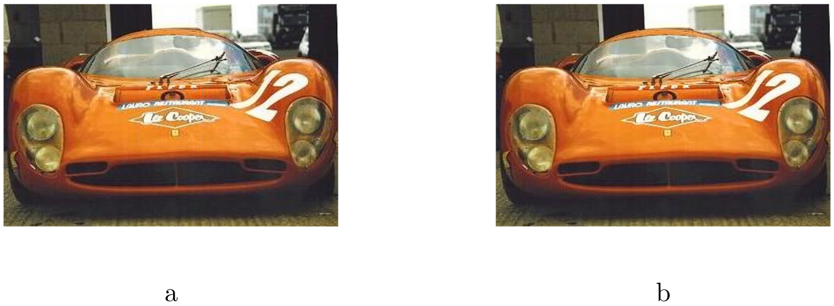
I have enrolled in the CSE 252 A in Piazza. I will use Matlab for my coding assignments.

**Problem** 2. Image manipulation:

On the course website, you will find 4 sets images (border1.jpeg and center1.jpg,border2.jpeg and center2.jpg, border1.png and center1.png, and border2.png and center2.png). The border images have had their center removed, and centers represent the respective removed portions.Write a matlab or python function that loads two images (border and center) and reconstructs the original image from them, then displays them. Do not use any for or while loops, or any hard coded sizes or borders and you should use the same function to reconstruct both images.

Answer: I use a matrix that matches the center with ones in it to filter the border. According to the filter2 function in Matlab, the minimum value in the matrix after filtering is actually the most left and up point of the center. Then I get the coordinate value of this point. To add the center to the border, I use some matrixes with zeros in them and joint them together with the center. Then add border to it.

Outputs:



a

b

Figure 1: (a) output of figure 1 in jpeg, (b) output of figure 1 in png.

c

d

Figure 2: (c) output of figure 2 in jpeg, (d) output of figure 2 in png.

Listing 1: Codes of hw 0

```
clear;
borc=imread('F:/border1.png');  %Input can be changed.
cenc=imread('F:/center1.png');  %Input can be changed.

cen1=cenc(:,:,1);
cen2=cenc(:,:,2);
cen3=cenc(:,:,3);
bor1=borc(:,:,1);
bor2=borc(:,:,2);
bor3=borc(:,:,3);

borg=rgb2gray(borc);  %transform the rgb image to gray.
borg=double(borg);    %transform the unit8 image to double.
ceng=rgb2gray(cenc);
ceng=double(ceng);
[height1,width1]=size(borg);  %get the size of the image
[height2,width2]=size(ceng);

fil=ones(height2,width2);       %filter
F=filter2(fil,borg,'valid');

mini1=min(F);
mini2=min(mini1);

[col,row]=find(F==mini2);  %find min
y1=col(1,1);
y2=y1+height2;
x1=row(1,1);
x2=x1+width2;

diff=-1;                   %error correction
up=zeros(y1+diff,width1);
down=zeros(height1-y2-diff,width1);
left=zeros(height2,x1+diff);
right=zeros(height2,width1-x2-diff);
```

```

    temp01=[left ,cen1];      %joint matrixes
    temp11=[temp01,right];
    temp21=[up;temp11];
    temp31=[temp21;down];
    temp02=[left ,cen2];
    temp12=[temp02,right];
    temp22=[up;temp12];
    temp32=[temp22;down];
    temp03=[left ,cen3];
    temp13=[temp03,right];
    temp23=[up;temp13];
    temp33=[temp23;down];

    result1=temp31+bor1;
    result2=temp32+bor2;
    result3=temp33+bor3;

    result(:,:,1)=result1;   %transform to rgb image
    result(:,:,2)=result2;
    result(:,:,3)=result3;

    figure;imshow(result);   %show the image
```

*Submitted by Mingxuan Wang on October 5, 2014.*