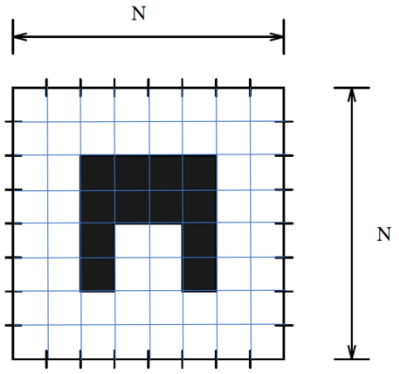
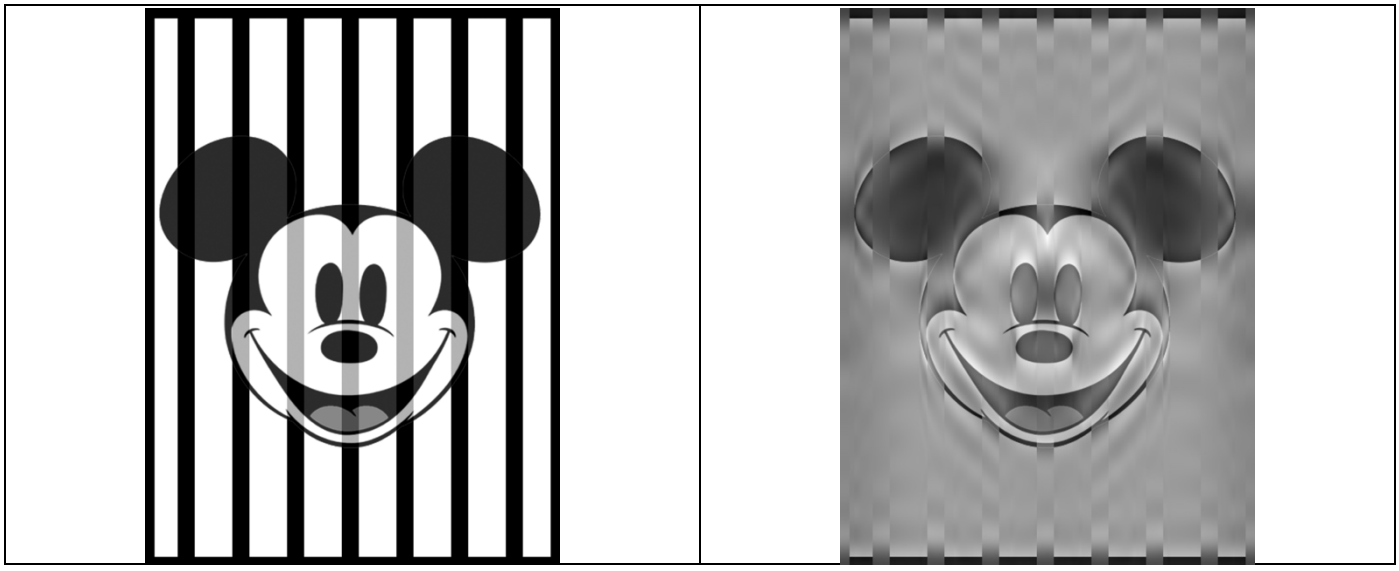
Homework 05

Due Friday May 3 at 11:59 pm

1. Use the region split and merge, quadtree approach to segment the image shown below. You don't need to code this in matlab, just show schematics of each step and give a description of the approach for split and merge. Let P (Ri)=TRUE if all pixels in the Region (Ri) have the same intensity (black=1 and white=0). Show the final quadtree corresponding to your segmentation. This is a handwritten exercise, i.e. I only need to see your implementation of the split and merge region segmentation method using quadtree.



2. Perform filtering in the frequency domain to for image enhancement. Mickey Mouse has found himself behind bars and does not want his fans to see him in jail ! He wants your help. Design a custom mask to filter the periodic transform of the image Mickey_in_Jail.tif and create a new image of Mickey not in jail. That is, you need to get Mickey a picture that his fans, without being embarrassed (i.e. mickey NOT behind the jail bars). Note: You need to visually diminish the presence of the bars so Mickey's fan can't tell that he is in jail. That is, it is ok if your image has some shading/ringing artifacts. See sample below (note your results may vary from the result shown below).



3. In HW4, you used correlation for template matching in the spatial domain. This time you will perform correlation in the periodic domain. Read the images, hw4_im5.tif and filter mask hw4_mask5.tif. Calculate correlation between image and mask using FFT. Identify peaks of correlation output by thresholding and overlay peaks onto original image to confirm matching.