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close all
clc

% Copy this file into a Matlab script window, add your code and answers to
the
% questions as Matlab comments, hit "Publish", and upload the resulting PDF
file
% to this page for the tune-up assignment. Please do not submit a link to a
file
% but instead upload the file itself. Late penalty: 2 points per minute
late.

% This tuneup is to help you get started on the mini project number #2

% (a) Load the image. Download the image from
% https://users.ece.utexas.edu/~bevans/courses/signals/homework/
% echar512.matLinks to an external site.
% and place it in the current directory or a directory on the Matlab path.

load echar512.mat

% The load command will define a Matlab matrix echart.

% (b) Display the image.

figure;
imshow(echart);

% Describe the image.
% -> They are rows of letters, whose reducing in font size as we moving down
the
% collums, the width of the letter are getting smaller.

% (c) Interrogate the values in the image by clicking on the
% Matlab variable in the workspace.

% What values are in the image?
% -> All the values are either 0 or 255 since there are only white and
% black pixels in the image.

% To what grayscale intensities do they correspond?
% -> They are scale from 0 to 255, with 0 correspond to black,
% 127 corresponding to gray 255 correspond to white.

% (d) Apply a two-point averaging filter along the rows.
% Display the resulting image.
% Describe the result image compared to the original.

% -> The image start losing quality (getting blurry), most noticeable at
% the bottom rows of letters compare to the original. Also, the width of
% the letter also decrease and the grayscale intensities change to
% black = 0; midgray = 255; and white = 510 (max);

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FIRcoefficients1 = [1 1];
echartFilteredAlongRows1 = filter(FIRcoefficients1, 1, echart, [], 2);
figure;
imshow(echartFilteredAlongRows1);

% (e) Apply a three-point averaging filter along the rows..
%     Display the resulting image.
%     Describe the result image compared to the original.

% -> The image start losing more quality (getting blurrier), most noticeable
at
% the mid to bottom rows of letters compare to the original. Also, the width
of
% the letters decrease (some are only 1 pixel left) and the grayscale
% intensities change to
% black = 0; midgray = 255-510; and white = 765 (max);


FIRcoefficients2 = [1 1 1];
echartFilteredAlongRows2 = filter(FIRcoefficients2, 1, echart, [], 2);
figure;
imshow(echartFilteredAlongRows2);
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A 6x5 grid of letters is displayed on a white background, which is itself centered within a larger black rectangular frame. The letters are arranged in six rows and five columns. The first row contains 'E', 'W', 'S', 'X', 'M'. The second row contains 'E', 'W', 'S', 'X', 'M', 'E'. The third row contains 'E', 'W', 'S', 'X', 'M', 'P', 'E'. The fourth row contains 'E', 'W', 'S', 'X', 'M', 'P', 'E', 'W'. The fifth row contains 'E', 'W', 'S', 'X', 'M', 'P', 'E', 'W', 'S', 'X'. The sixth row contains 'E', 'W', 'S', 'X', 'M', 'P', 'E', 'W', 'S', 'X', 'M', 'P'. The letters are in a serif font, and the spacing between them is consistent.

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A 6x6 grid of letters is displayed on a black background. The letters are arranged in a pattern that is symmetric both horizontally and vertically. The letters used are E, W, S, X, M, and P. The grid is as follows:

E	W	S	X	M	
E	W	S	X	M	P
E	W	S	X	M	P
E	W	S	X	M	P
E	W	S	X	M	P
E	W	S	X	M	P



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