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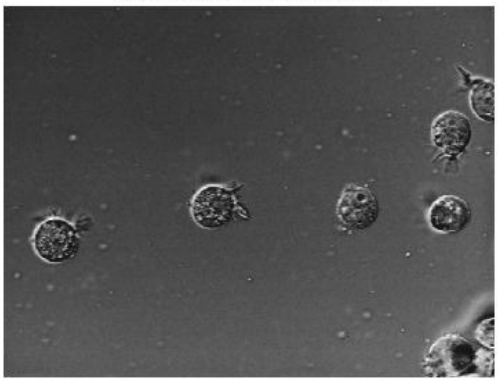
ENGS 111
HW 1
4/10/15

1) A

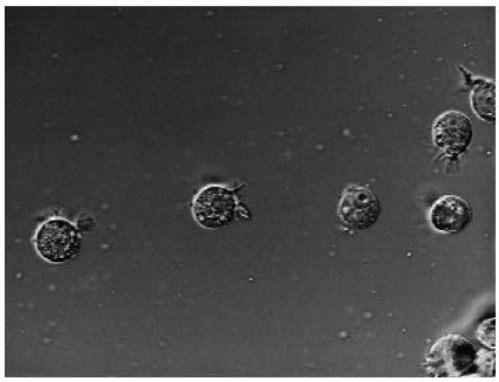
- File type: ‘tif’ format, [640 x 480] pixels, bit depth = 8, pixel values in [0, 255]
- ColorType: 'grayscale', data structure: unint8, size = 307200 bytes

- To conform to Matlab’s convention of images of type double, the converted image needs to be normalized such that the double values are in the range [0,1].

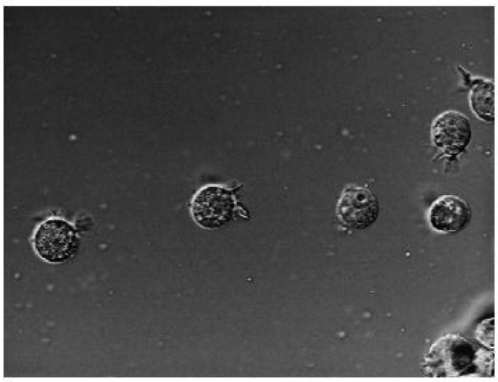
Original Image, command: imshow



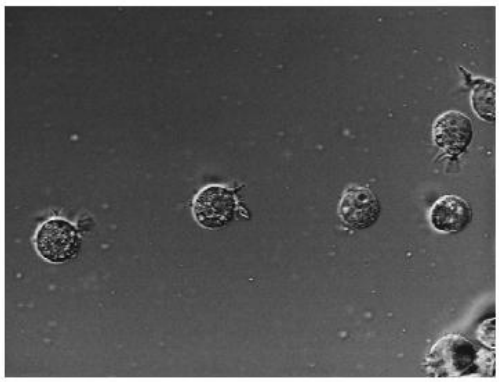
Original Image, command: imagesc



Altered Image, type double



Altered Corrected Image, type double

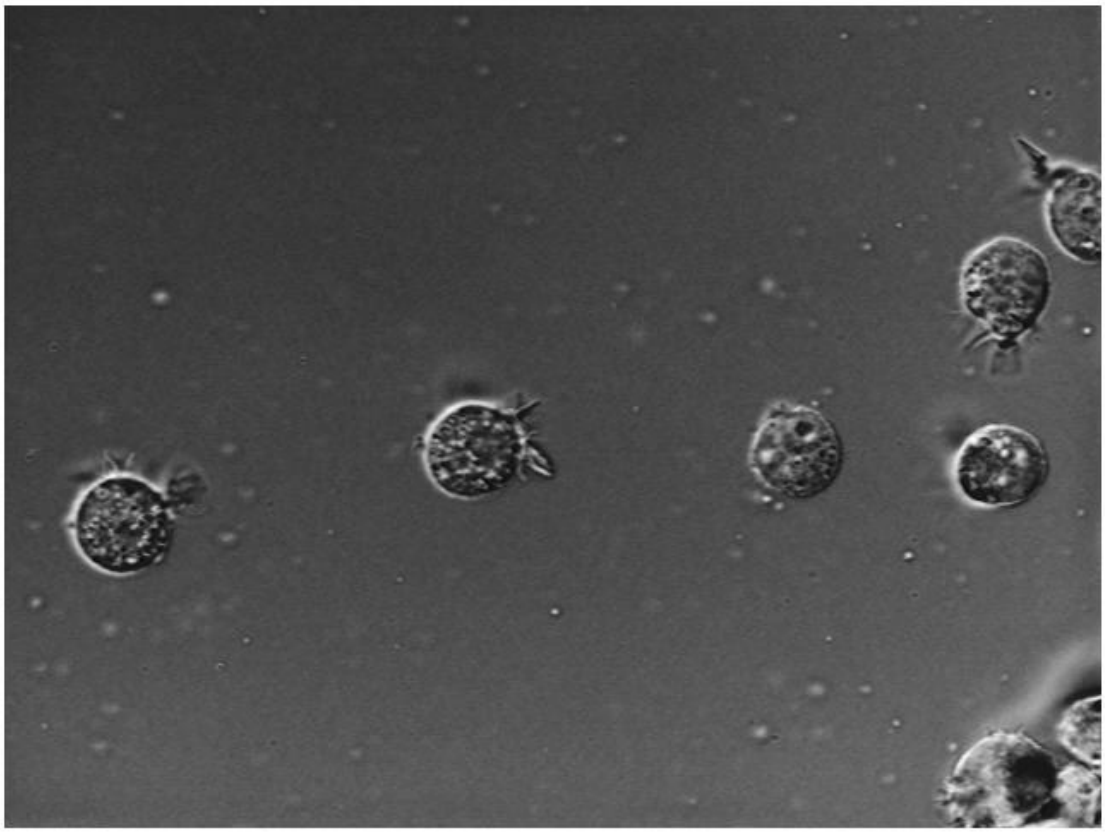


1) B

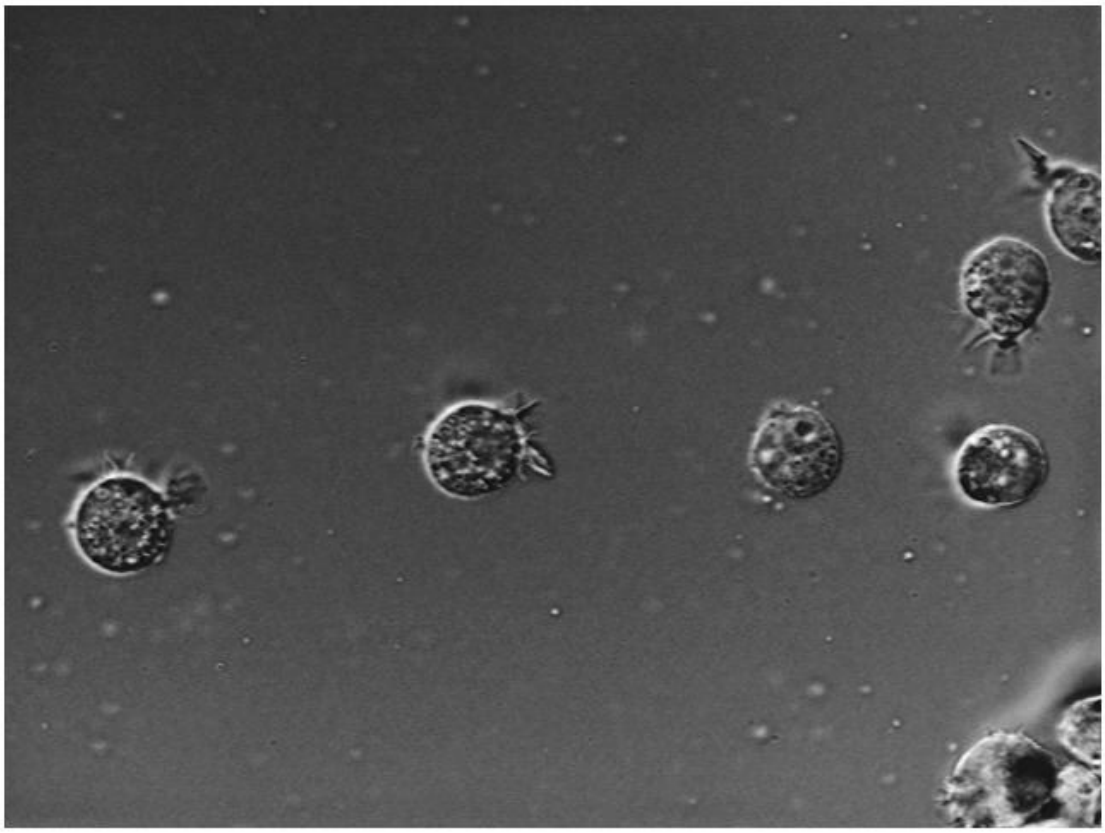
- The original image could be of any data type(binary, or double, or uint8) whereas the elements of imIndex are strictly integer as they are indices of the map matrix.

- Note: when displaying the four images in series in one figure, their visual appearance seemed to change drastically. So I have saved them individually. The commented out subplot commands are still left behind in HW1_B.m.

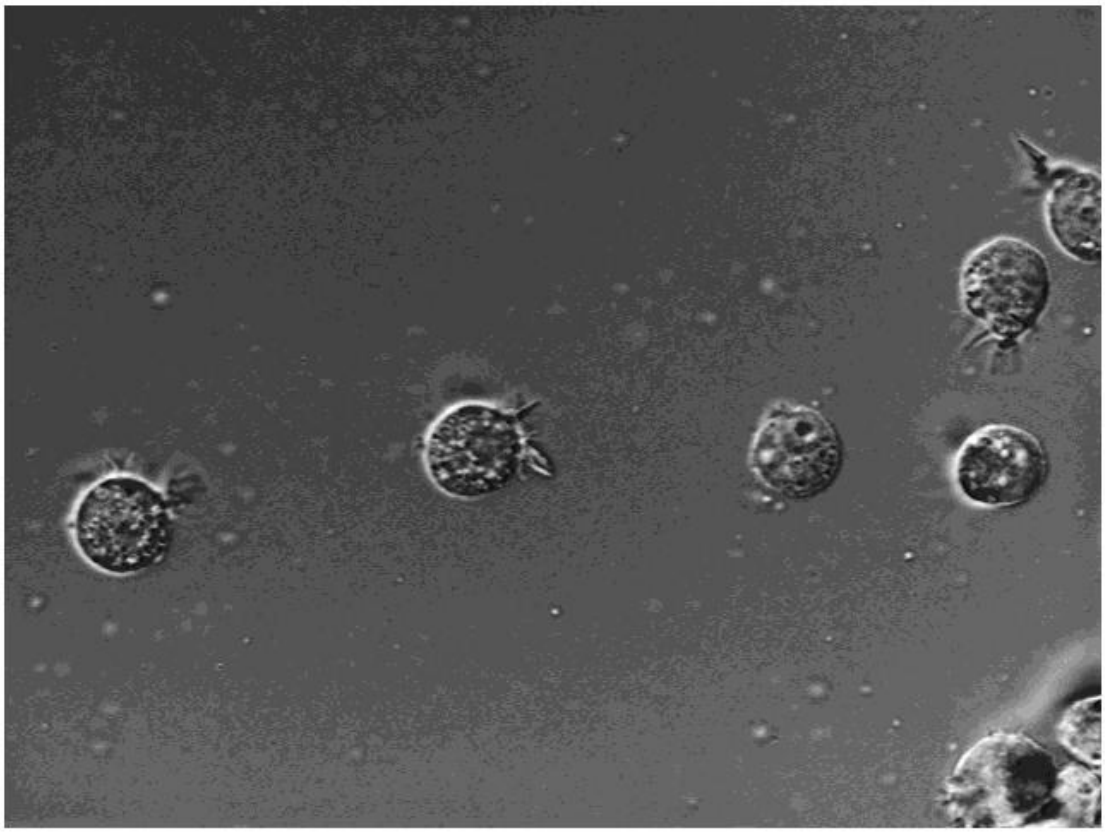
original image



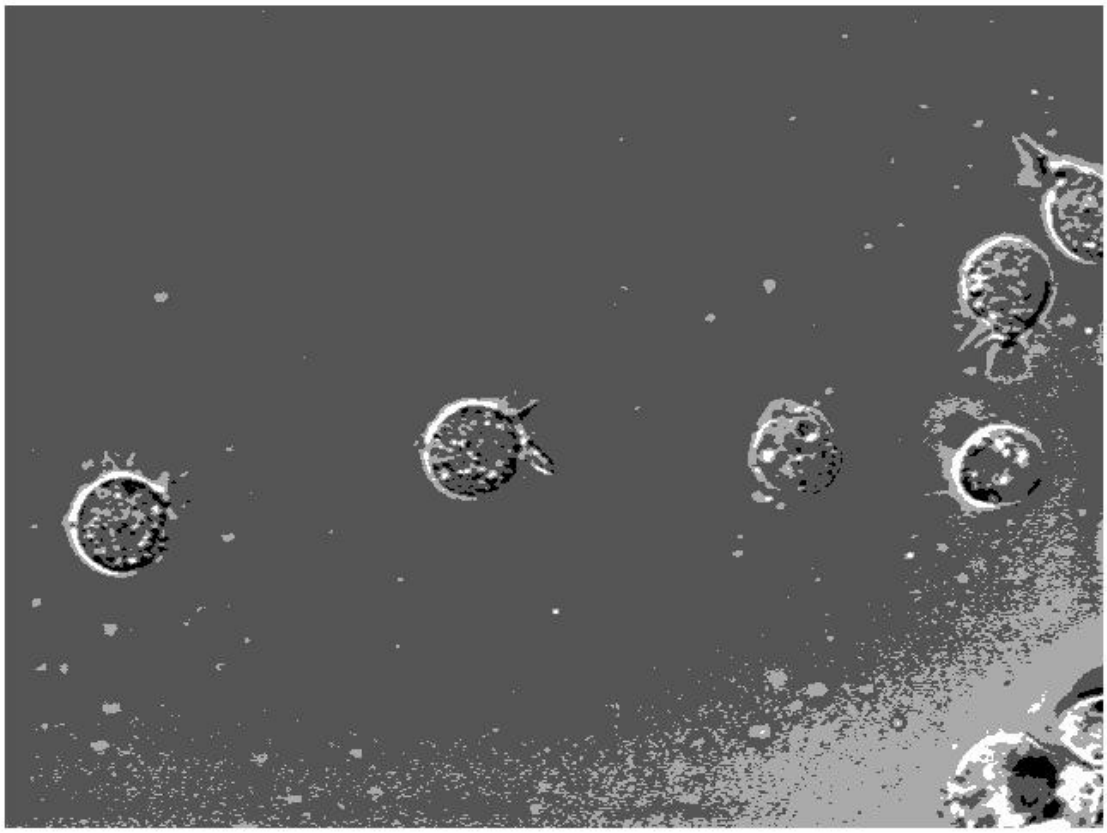
n = 64



n = 16



n = 4



3) C

Original Image

Histogram equalized - individual channel

Histogram Equalized - new approach(uint8)

Histogram Equalized - new approach(double)

Histogram equalized for individual channel produced the right image on the top row. The image appears to be brighter. The color of the background textile has changed significantly from darker shade of blue to more brighter shade of blue. The crease marks are also more visible in the new image. There are distinct patches, especially in the peppers, where there are two different shades of red.

I tried the suggested new approach using two different data types of images. The left image in the bottom row is entirely of type uint8. Color of the background textile and the foreground vegetables have changed. The peppers and chillies seem to have lighter shade of red and the textile a slightly different shade of blue as well. The shadowy areas seem to have become more darker thus enhancing the contrast in the image. The transition from lighter to darker shade is not smooth however.

The bottom right image is obtained using the suggested approach but the data type of image was converted to double for the purpose of processing. The crease in the background textile is more pronounced than in the original image. The contrast seems to be higher with a smoother transition from darker shade to lighter shade, unlike in the image in the left.