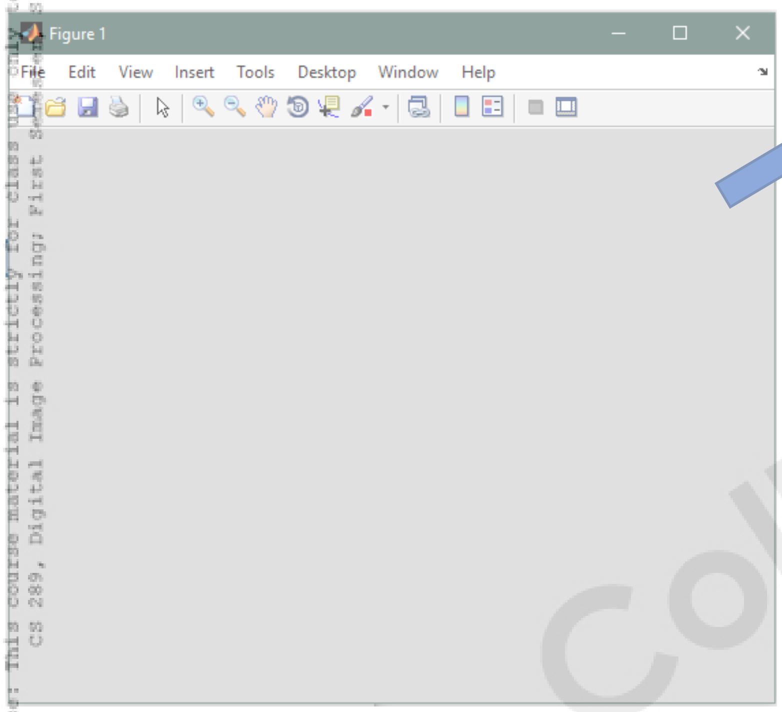
MATLAB colormaps

Every figure window has an associated colormap which it uses to display 2D arrays as images

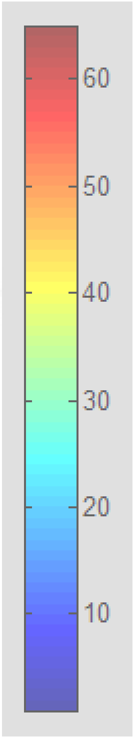


color	R	G	B
1	0.0	0.0	1.0
2	0.0	0.1	1.0
3	0.0	0.2	1.0
…			
…			
64	1.0	0.0	0.0

By default this contains 64 colors, so an array containing values from 0..64 will be displayed using the nearest color on the table.

If you use image() to display an 2D array then values outside the number of colors in the table will not be rendered correctly

imagesc() on the other hand rescales the input data to the number of colors in the table



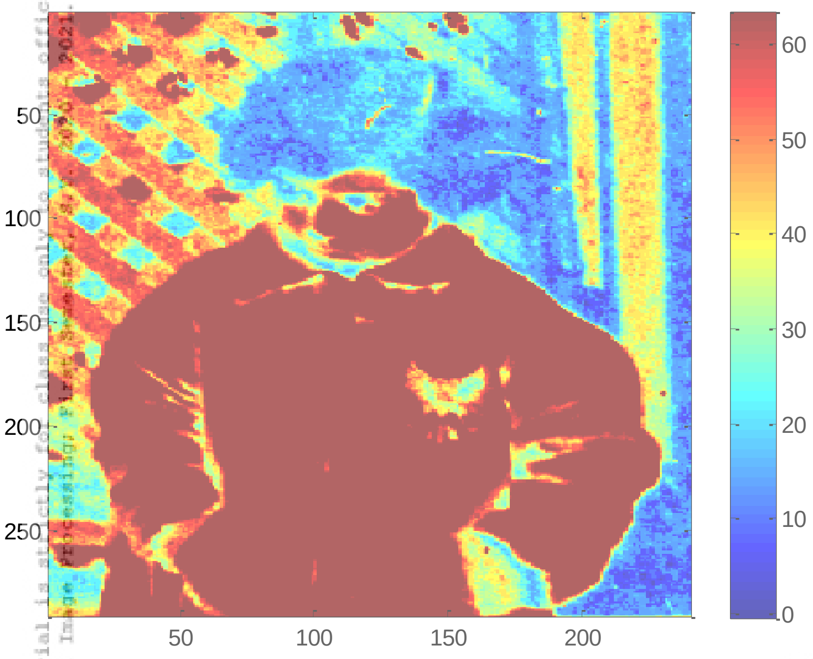
This is what the default 64 colormap looks like

The function colormap() can be used to set the colormap. Available colormaps include hot jet hsv and gray

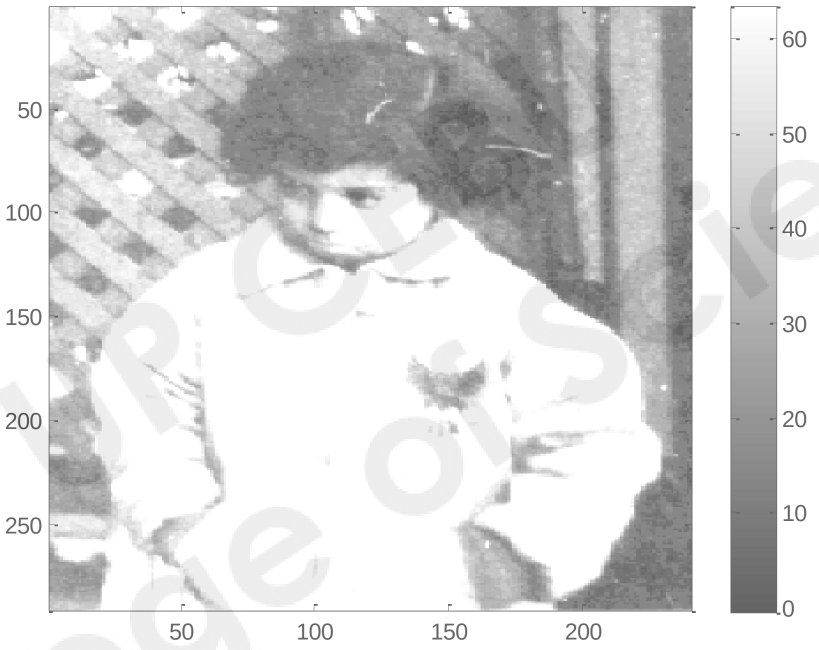
colormap(hot) sets the colormap to hot (64 colors)

colormap(gray(256)) sets the colormap to gray (256 colors)

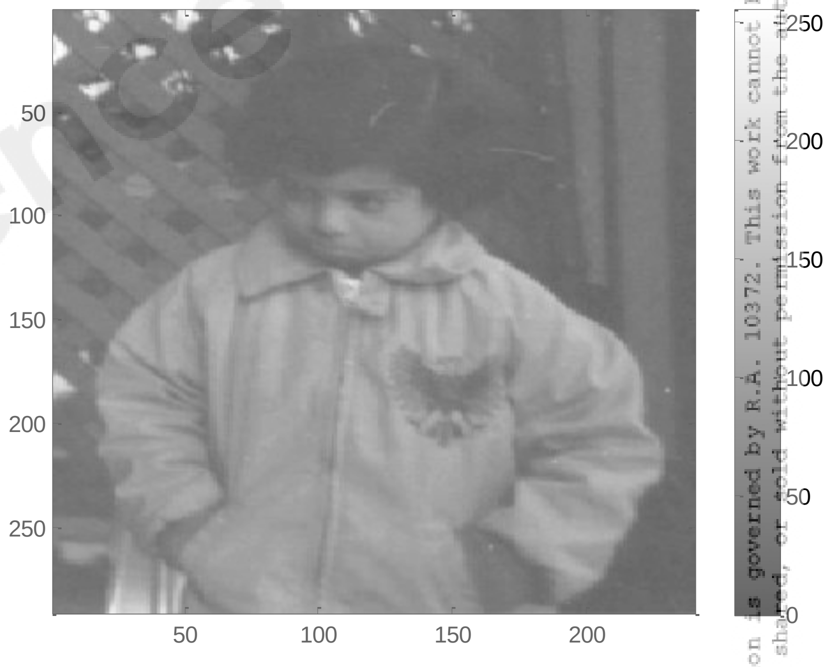
Example: using image() to display an 8bit monochrome image



default colormap
(aka jet)



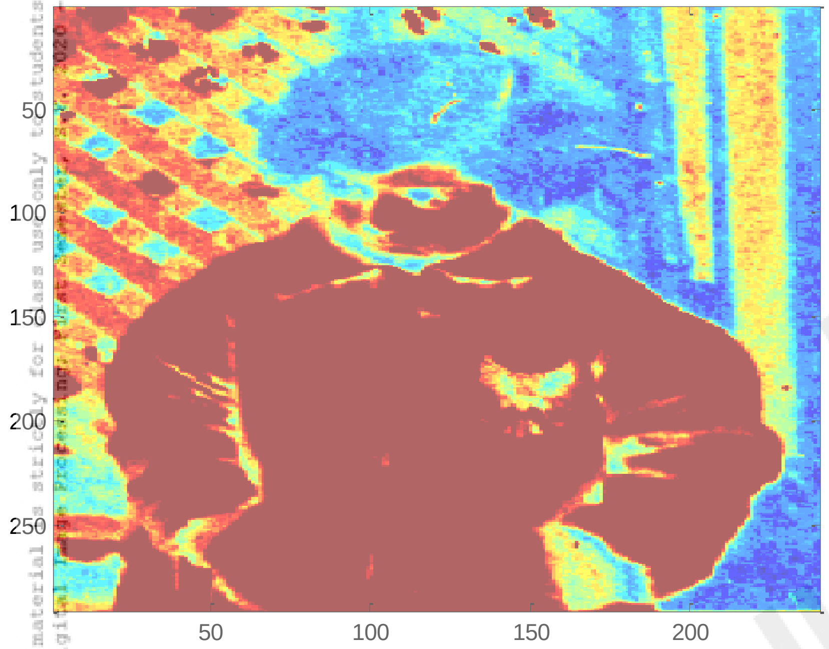
colormap(gray)



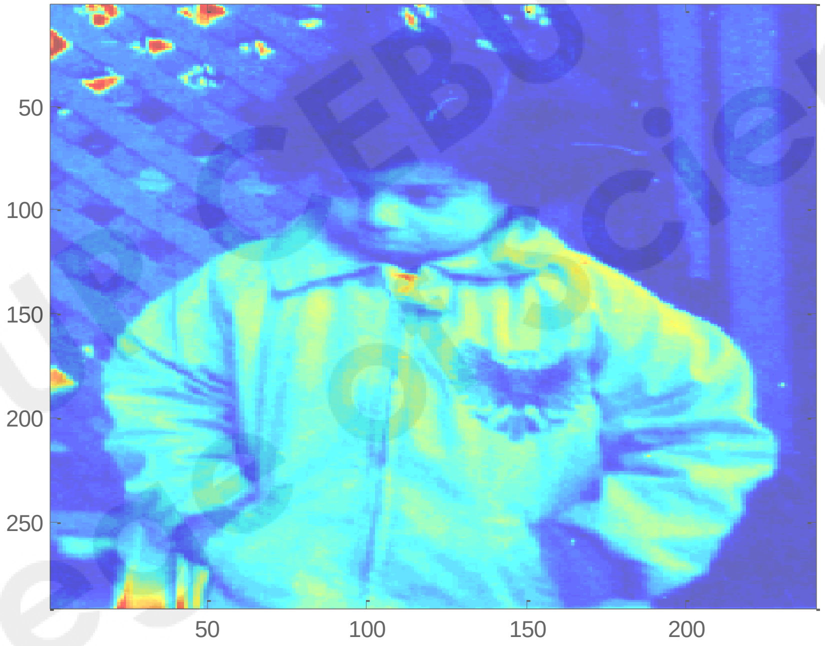
colormap(gray(256))

Note: For the first two images the values above 64 have been clipped as the uint8 image data has values in the range 0..255

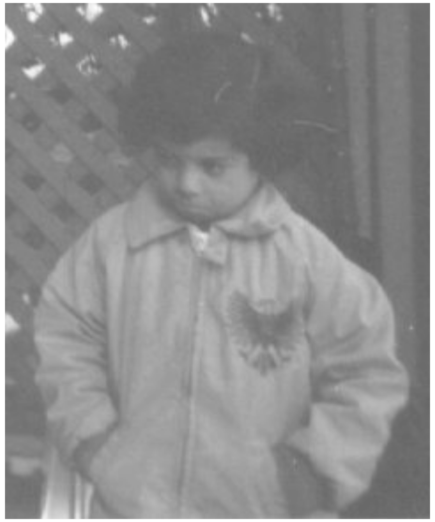
Example: image() versus imagesc() and imshow()



image()
(using default colormap)



imagesc()
(using default colormap)



imshow()
(automatically changes colormap and aspect ratio)

RGB color imagery   NxNx3 arrays

For NxMx3 arrays MATLAB does not use a colormap for image() imagesc() or imshow() it assumes the data is in RGB order and attempts to display the data accordingly

If the array is of type uint8 then the color values should be in the range 0..255

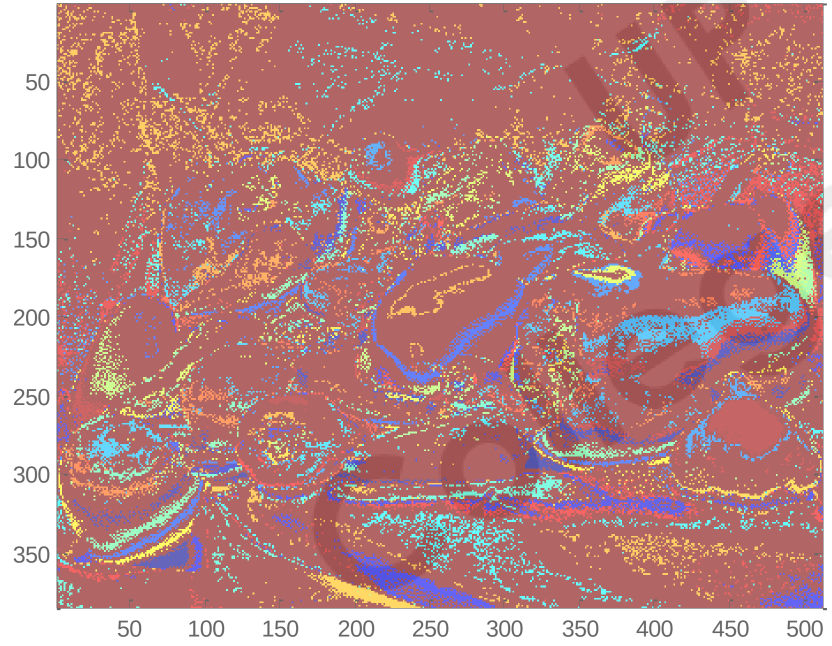
If the array is of type double then the color values should be in the range 0.0 to 1.0

If not then either the image will not display correctly OR matlab will return an “out of range” error

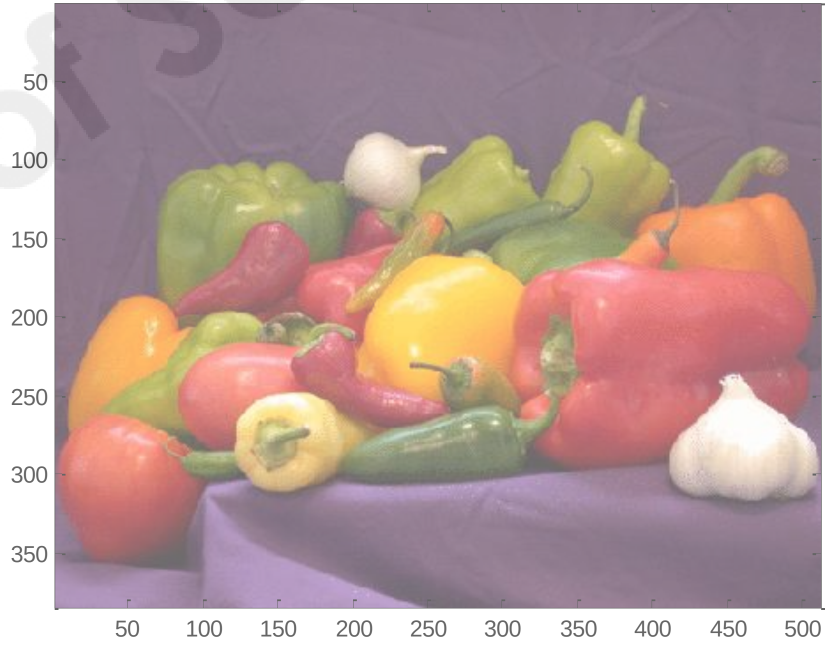
Imagery represented as an index array and a colormap

Some image types are stored as an array of color indexes and a color table

You can use image() on the array of indexes and colormap() on the color table to display these



An indexed color array displayed using image() (using default colormap)



An indexed color array displayed using image() (using the color table as the colormap)