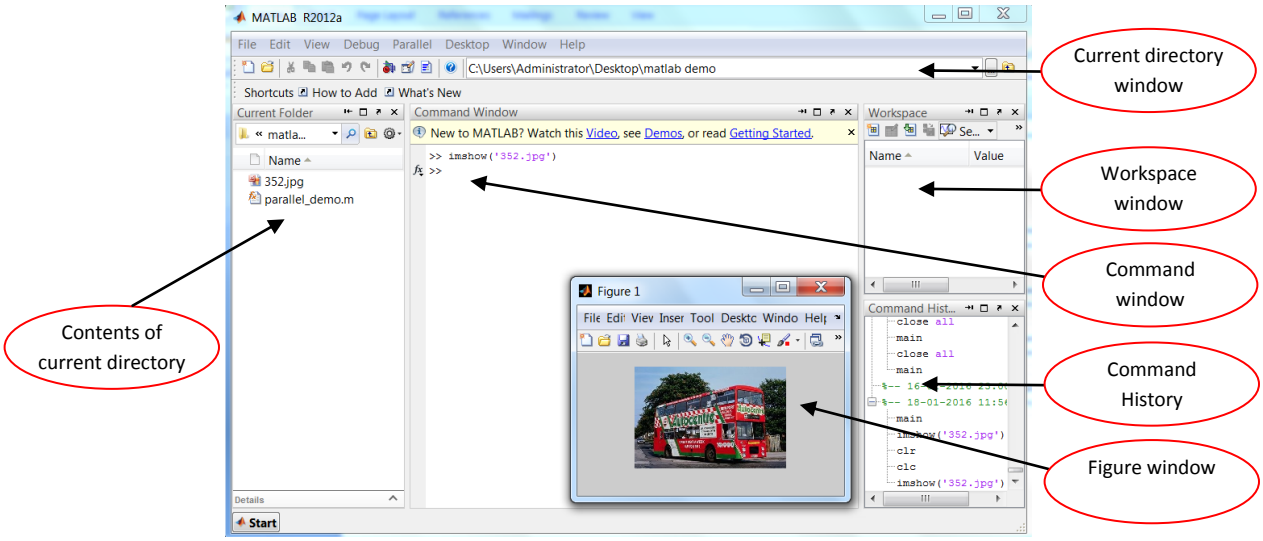
Image Processing using Matlab (Basics - Lab 1)

Matlab Desktop



Matlab Help: Type ‘help function_name’ in command window (or) browse through the main menu.

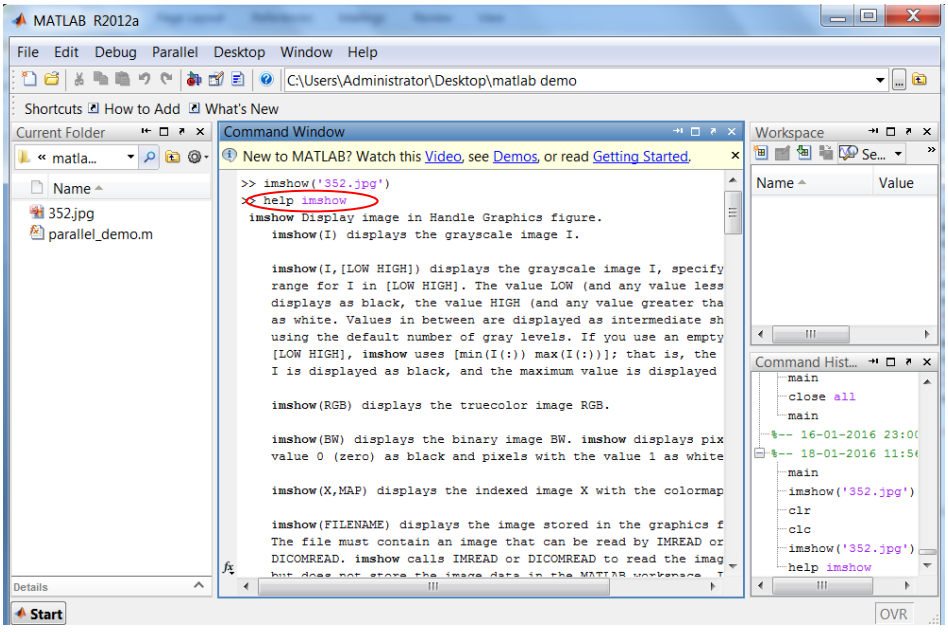
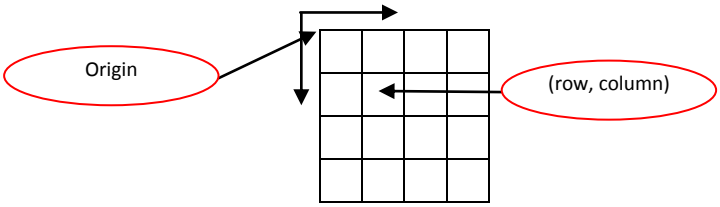
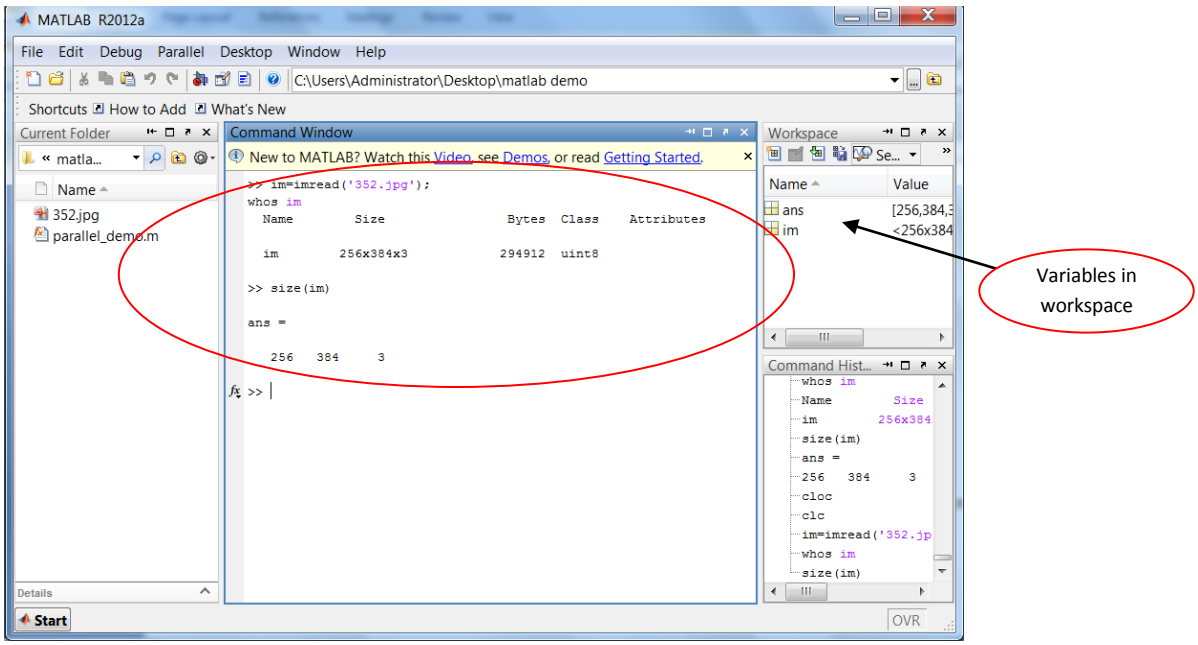


Image coordinate system in Matlab:



Reading the Image: imread. In following example, image '352.jpg' is read by imread and stored in variable im.



whos im displays the property of im and size(im) will return the Size of image in terms of the dimension as shown above. All the variables will be present in the workspace.

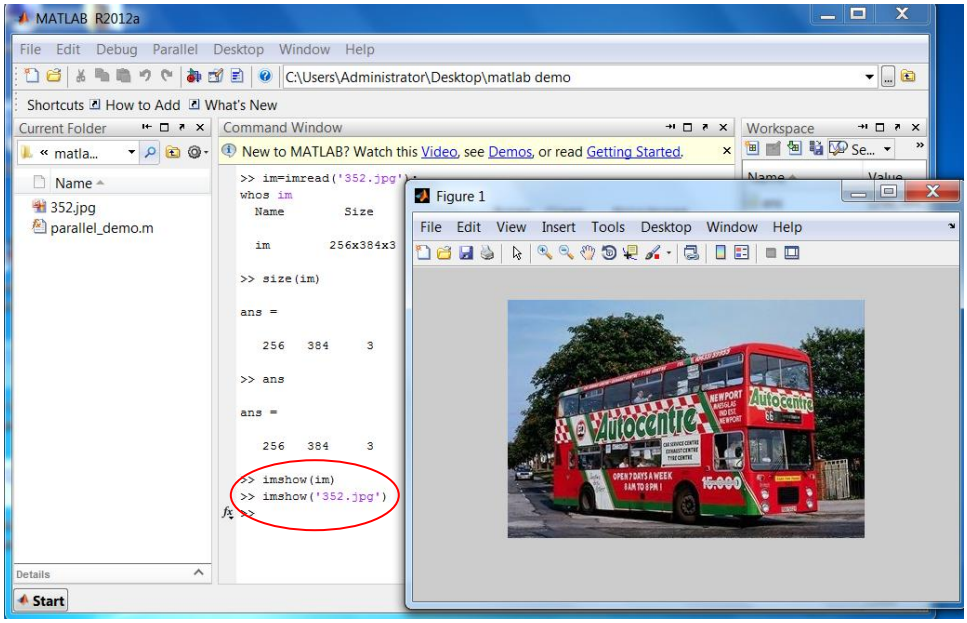
Displaying the image: imshow. In following example, the image is displayed using imshow.

Note that -

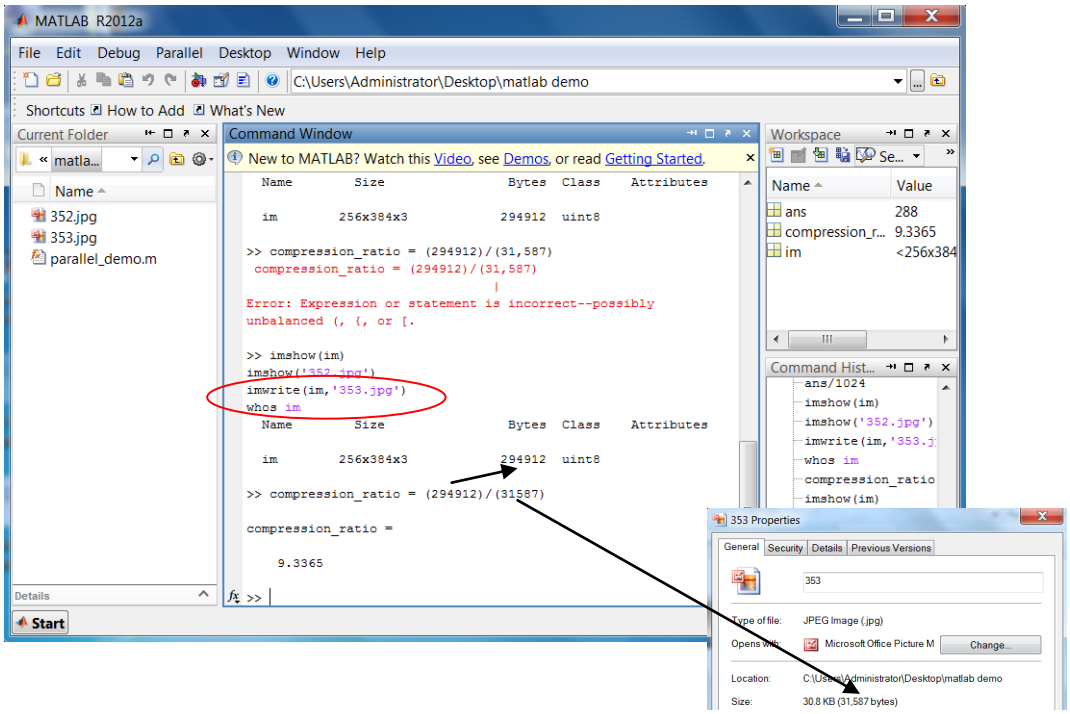
im=imread('352.jpg');

imhsow(im);

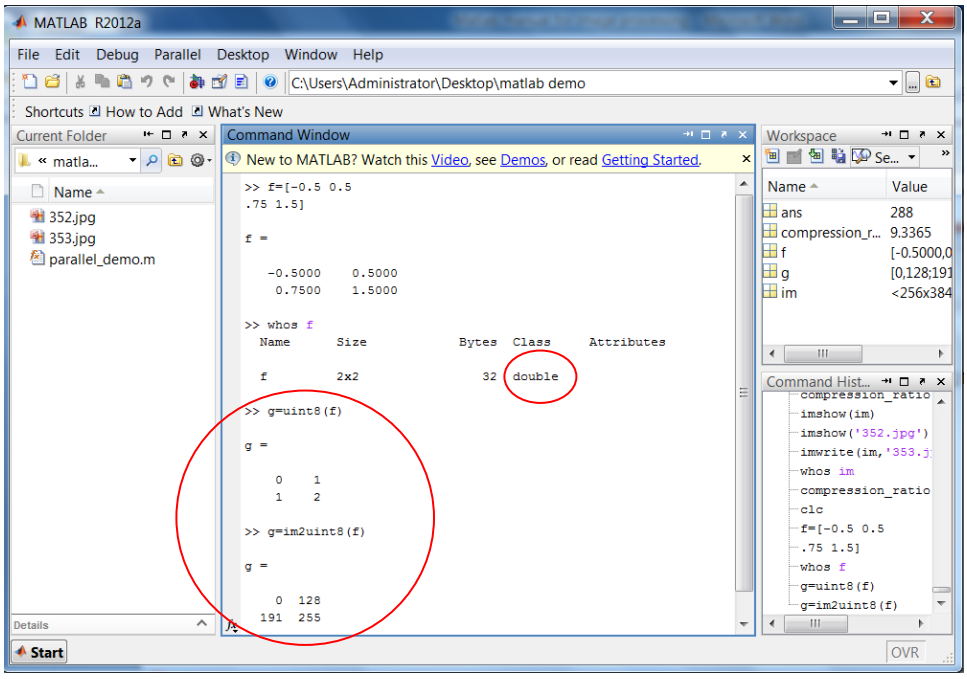
are equivalent to imshow('352.jpg')



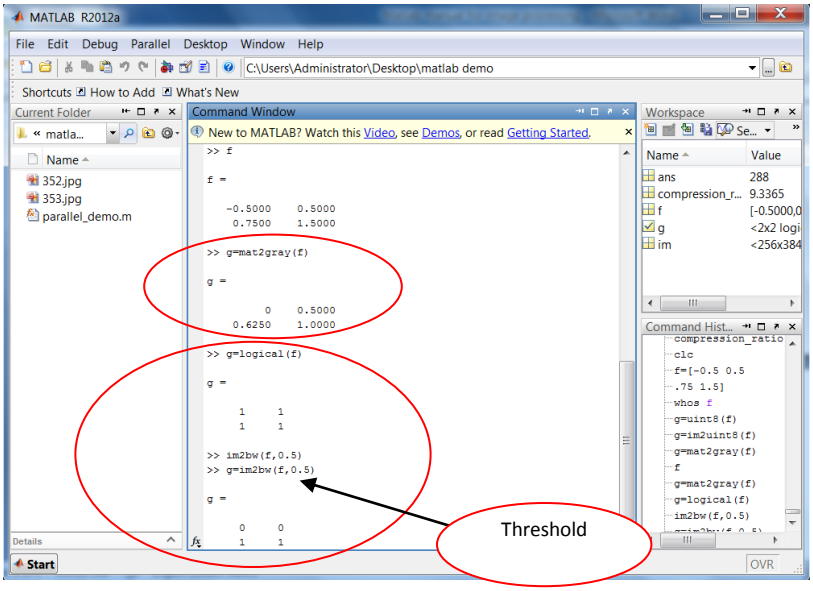
Writing the image: imwrite. imwrite compress the image using JPEG compression first then write. The compression ratio can be computed by dividing the actual size with the size of image after writing.



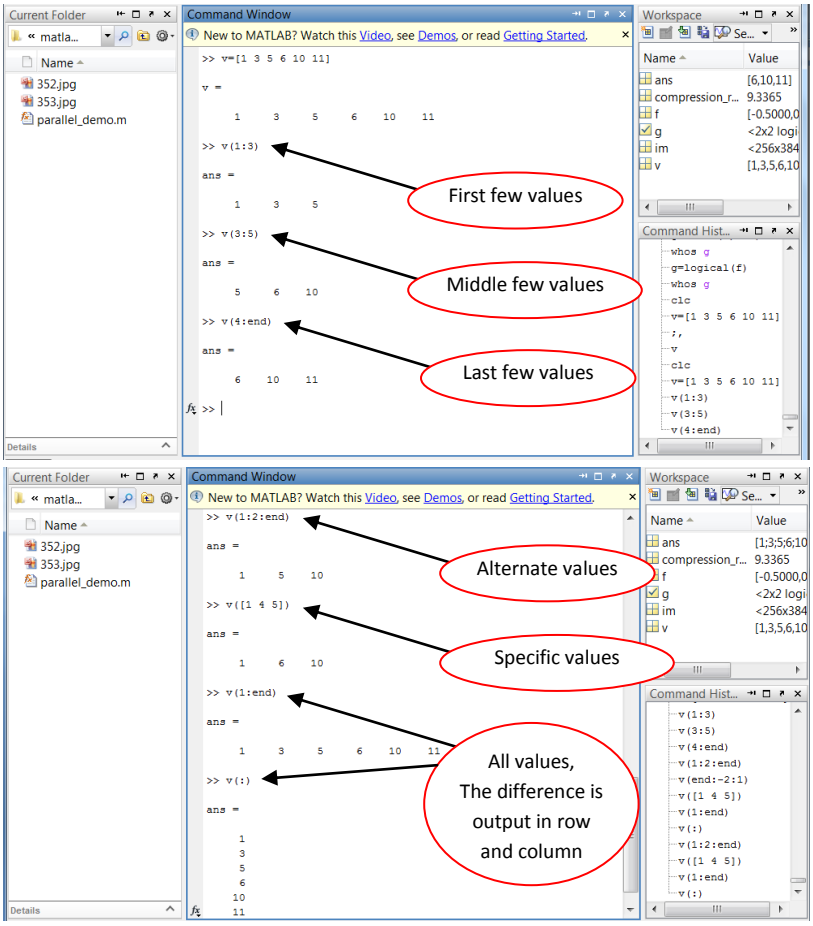
Data Classes: logical (1 byte), uint8 (1 byte), int8 (1 byte), char (2 byte), uint16 (2 byte), int16 (2 byte), single (4 byte), double (8 byte). The by default class assignment in matlab is double (see in below example). g=uint8(f) simply round the elements of f into the integer, all the values less than 0 and greater than 255 will be rounded to 0 and 255 respectively. Whereas, g=im2uint8(f) map the lowest and highest values of f to 0 and 255 respectively, the remaining values will also be mapped according to the linear mapping function.

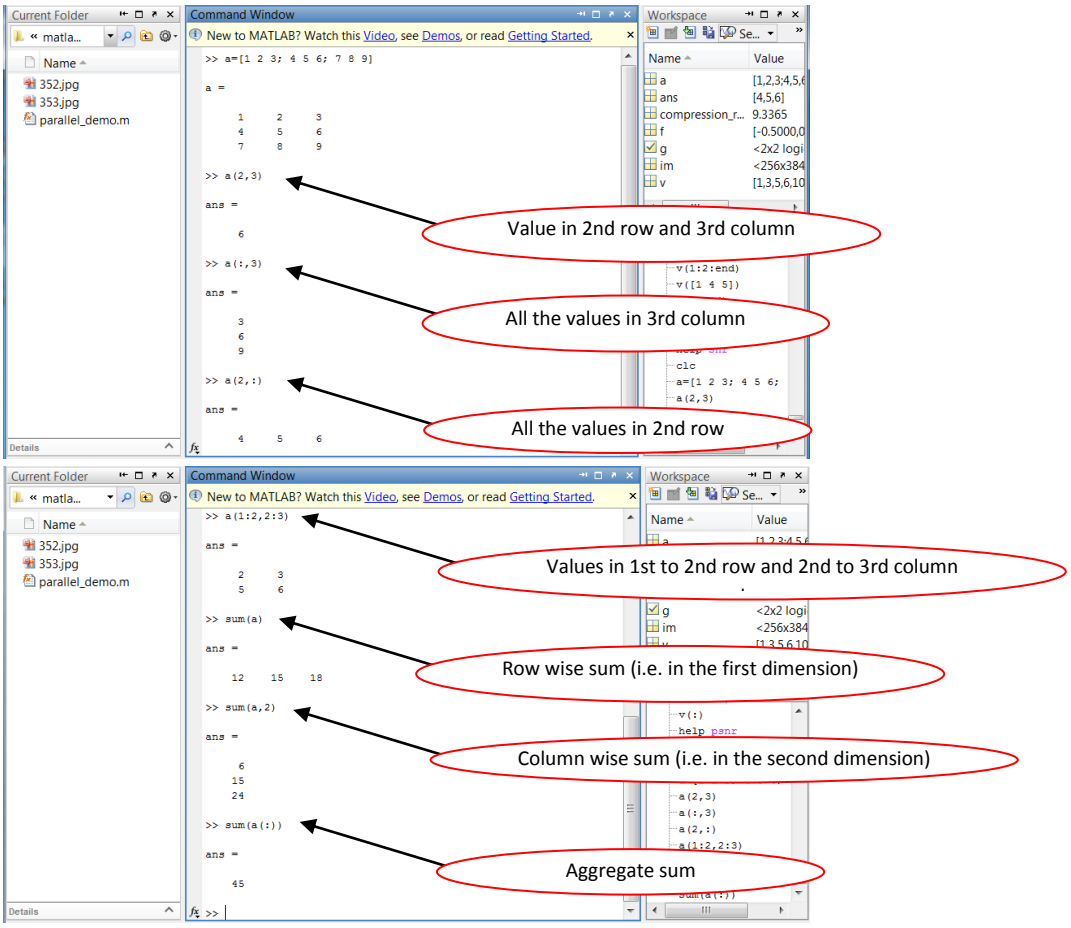


mat2gray(f) maps the values of f in the range of [0 1]. Any matrix can be converted into logical as g=logical(f), it returns 0 if the input value is 0 otherwise 1. Whereas, im2bw(f,t) returns 0 if f<=t otherwise 1, the output of im2bw is also logical.

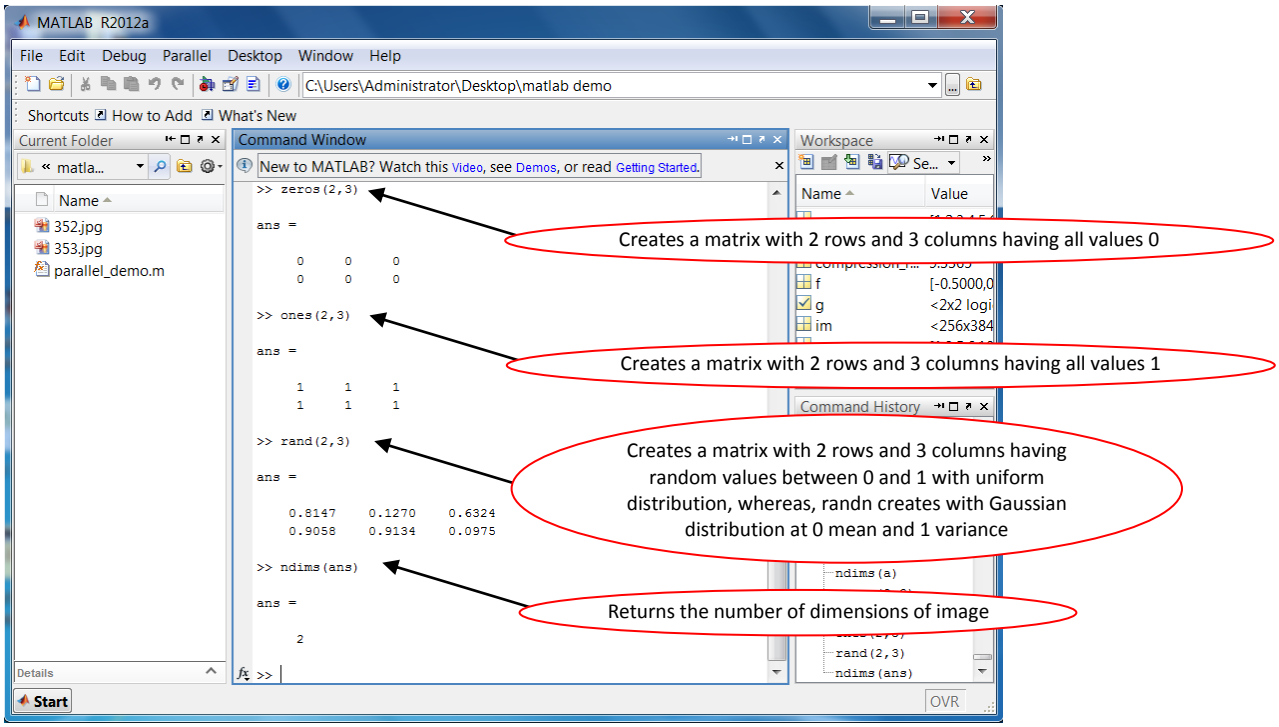


Vector Indexing: let ‘v’ and ‘a’ are two vectors of one and two dimensional, then elements of ‘v’ and ‘a’ can be accessed as shown below:

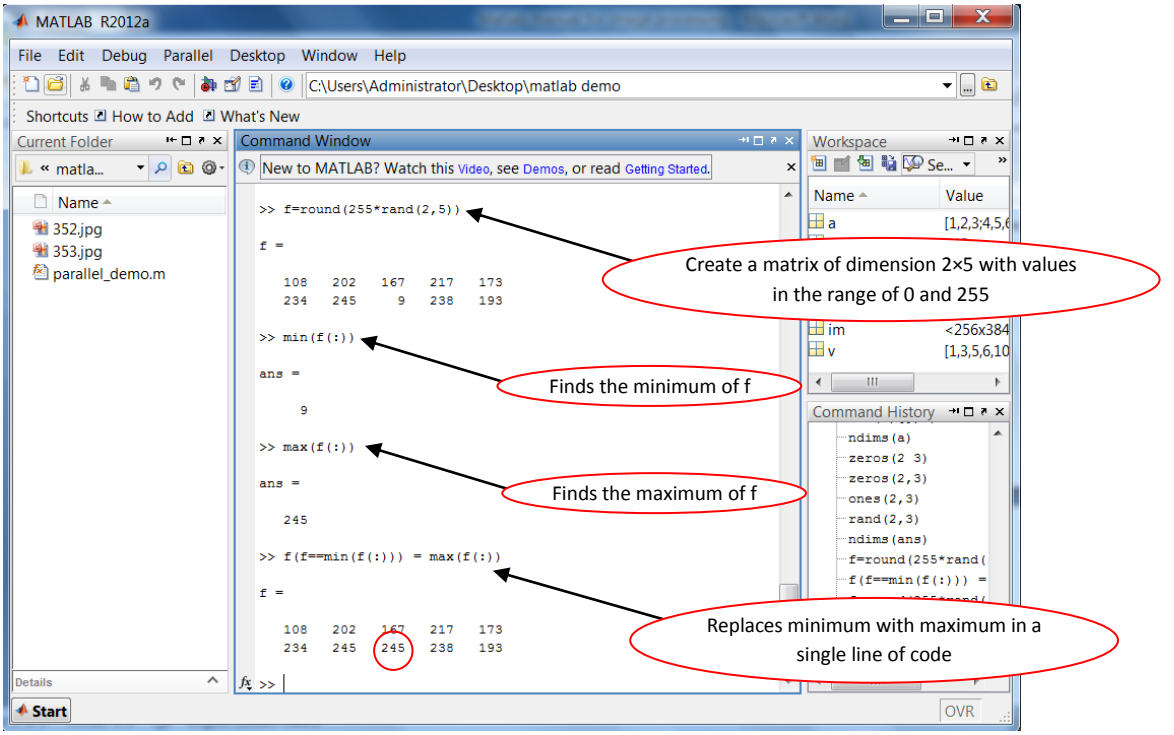




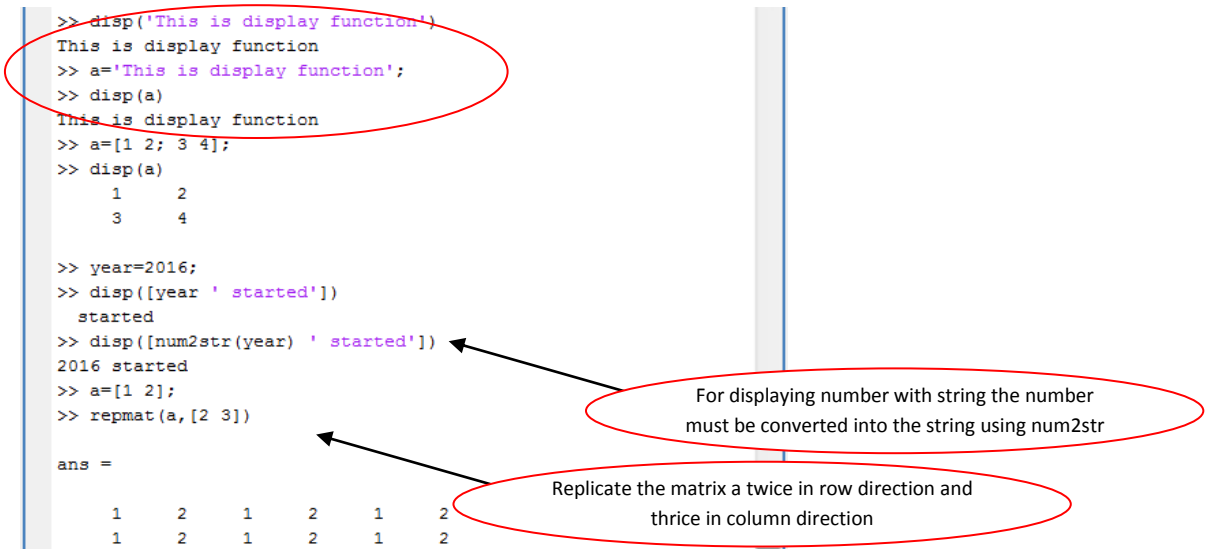
Generating special matrixes:



Ex. Replace the min value of a matrix f with the maximum value of f in one line of code. (i.e. code optimization)



Display:



Save and load: