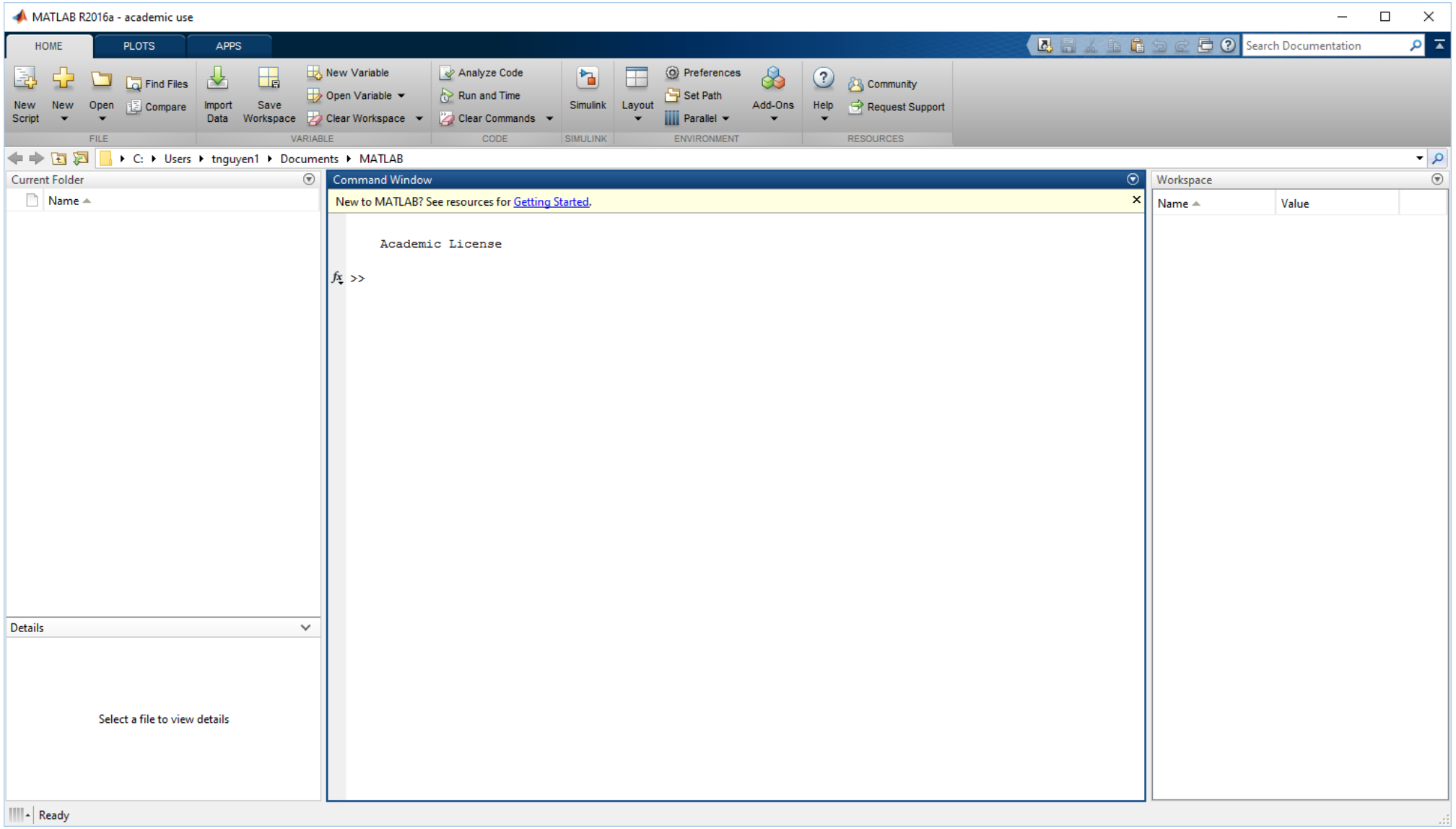
Lab 2

CPS592 – Visual Computing and Mixed Reality

MATLAB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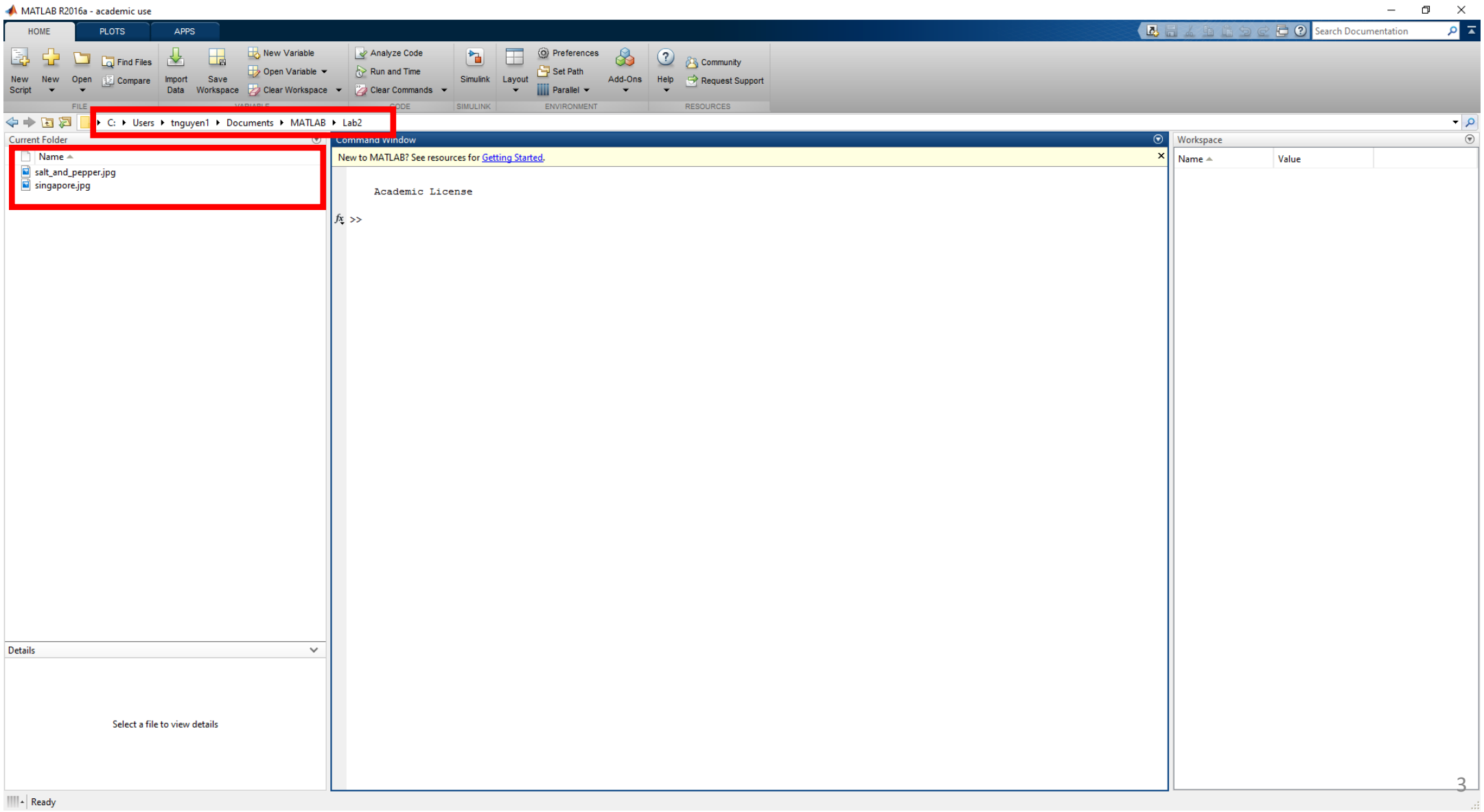
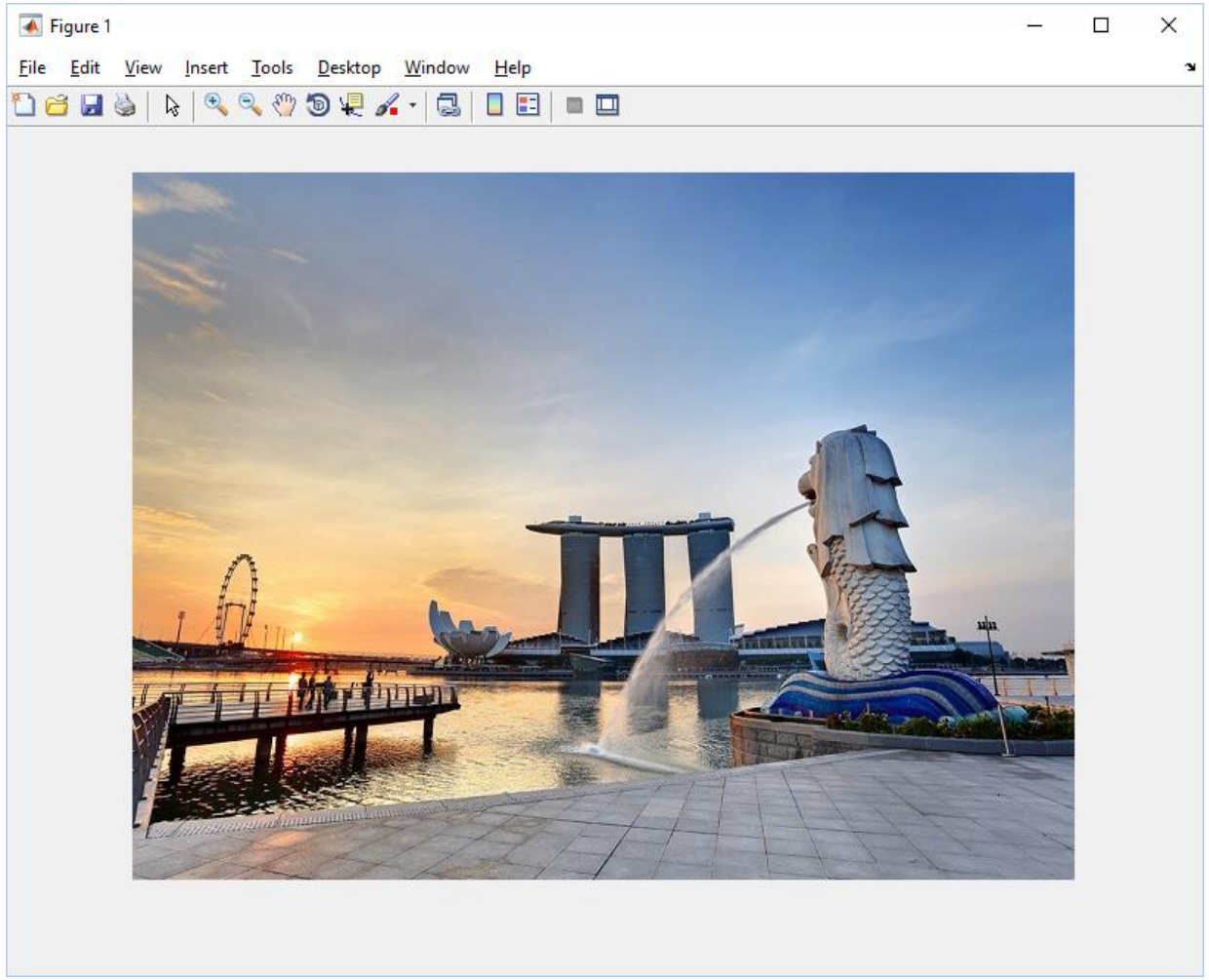


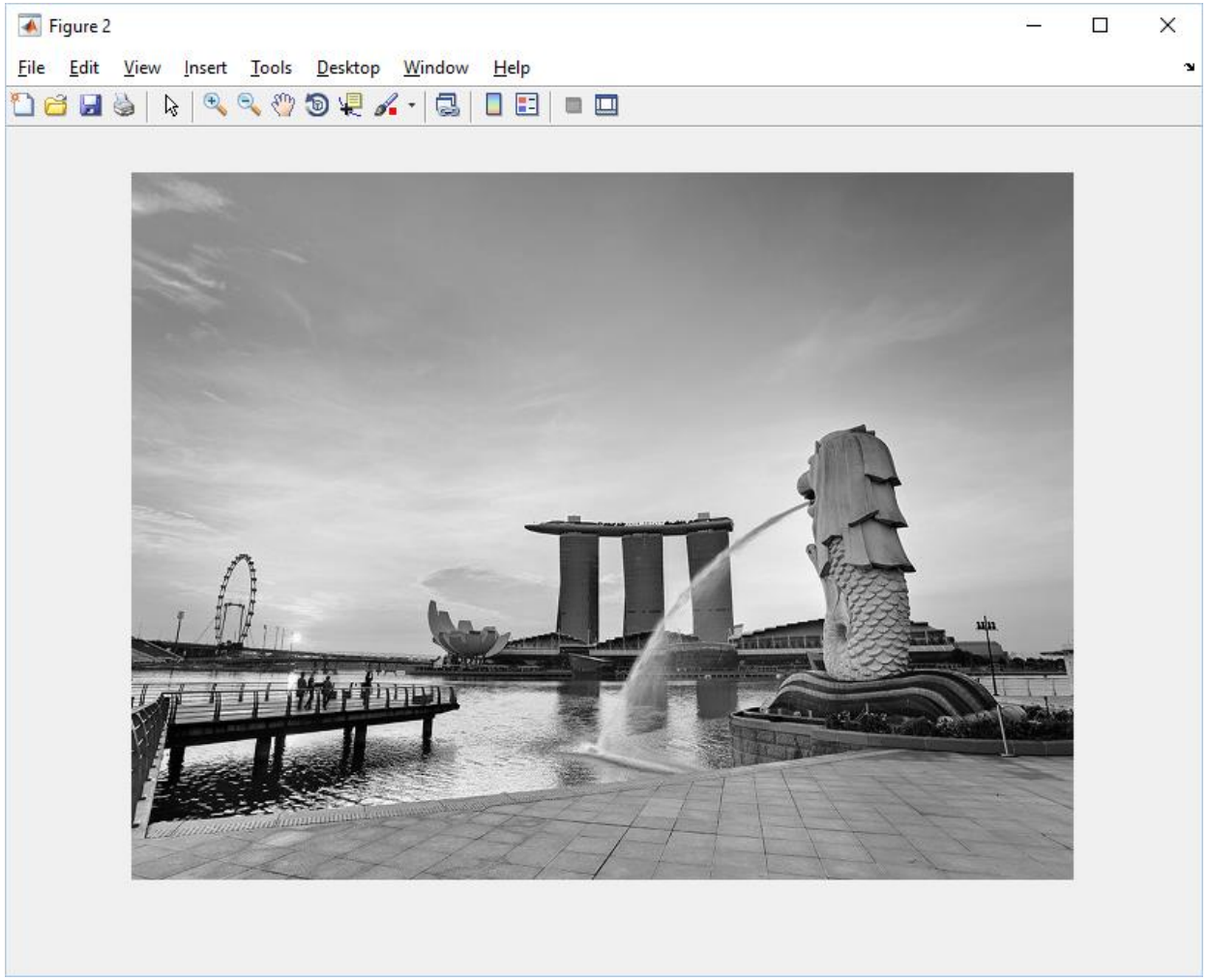
Read image from file

```
img = imread('singapore.jpg');
figure, imshow(img);
```



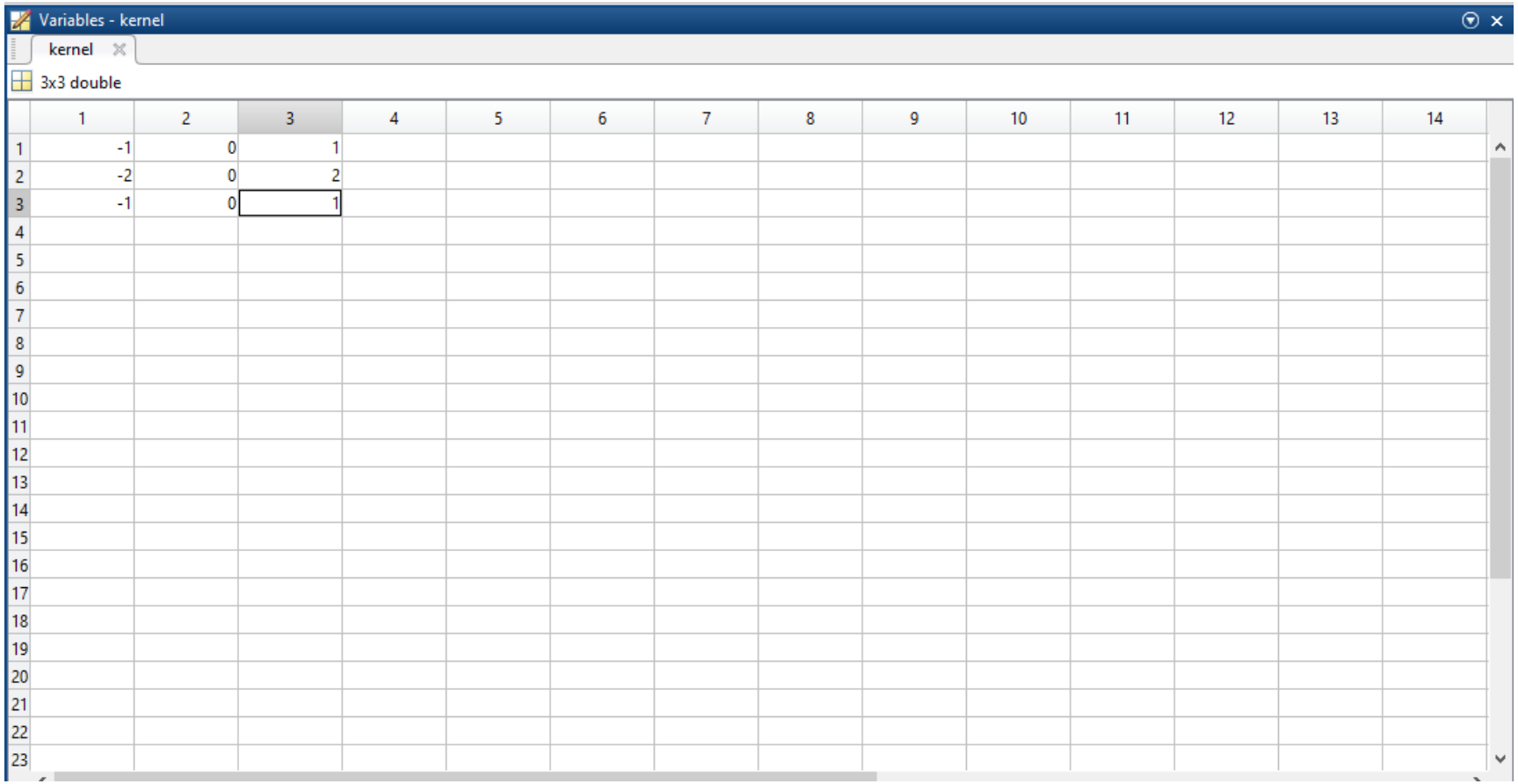
Convert image to gray

```
img_gray = rgb2gray(img);
figure, imshow(img_gray);
```



Declare filter kernel

kernel = [-1 0 1; -2 0 2; -1 0 1];



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	-1	0	1											
2	-2	0	2											
3	-1	0	1											
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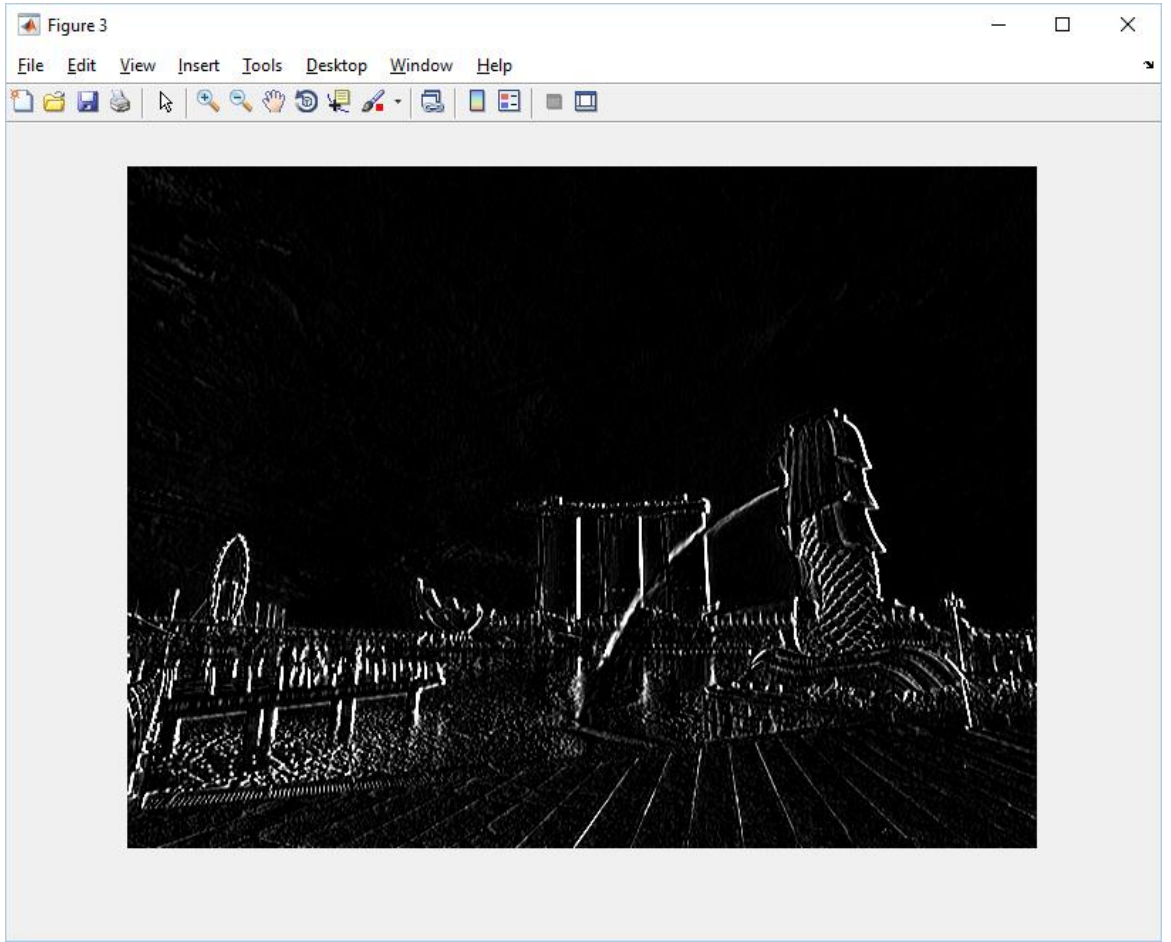
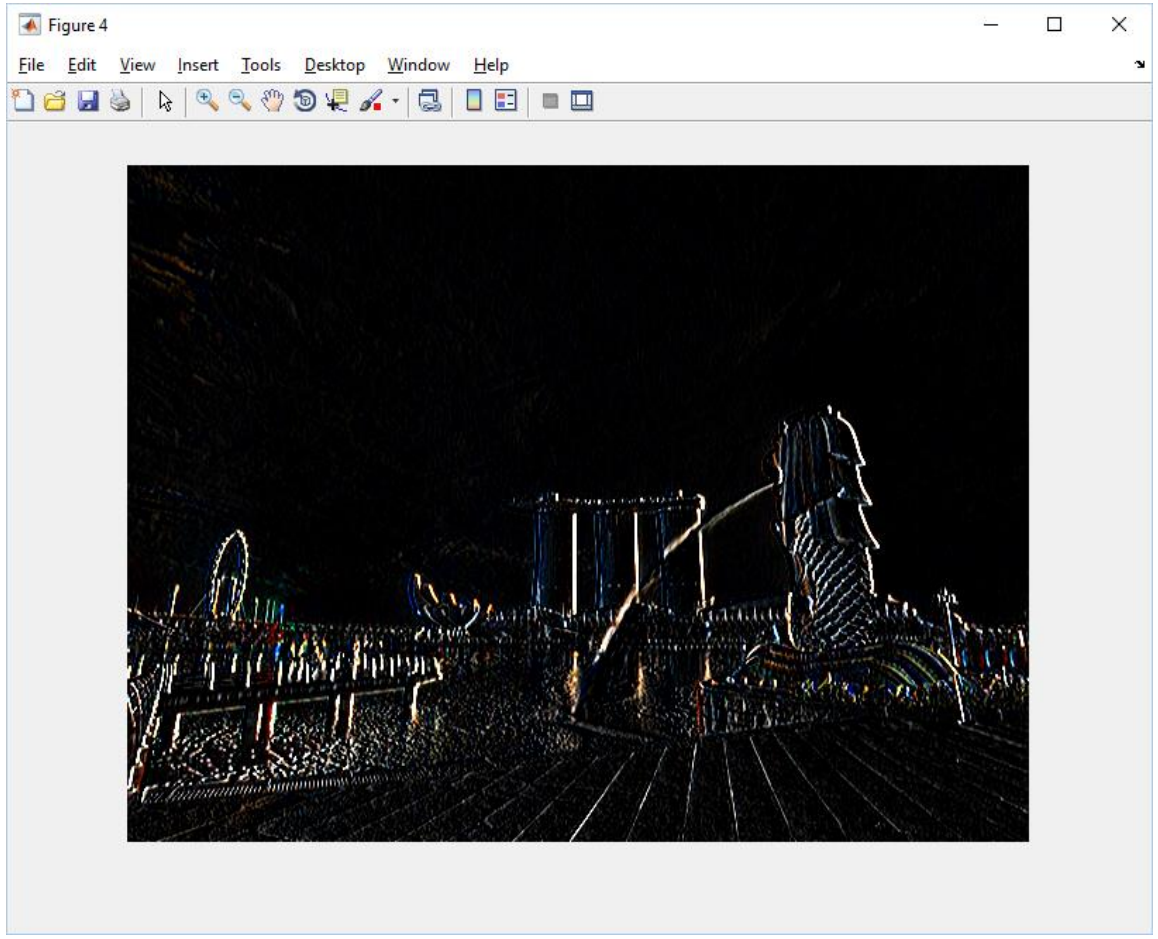
Apply filter on grayscale image

```
img_gray_sobel = imfilter(img_gray, kernel, 'replicate');
figure, imshow(img_gray_sobel);
```



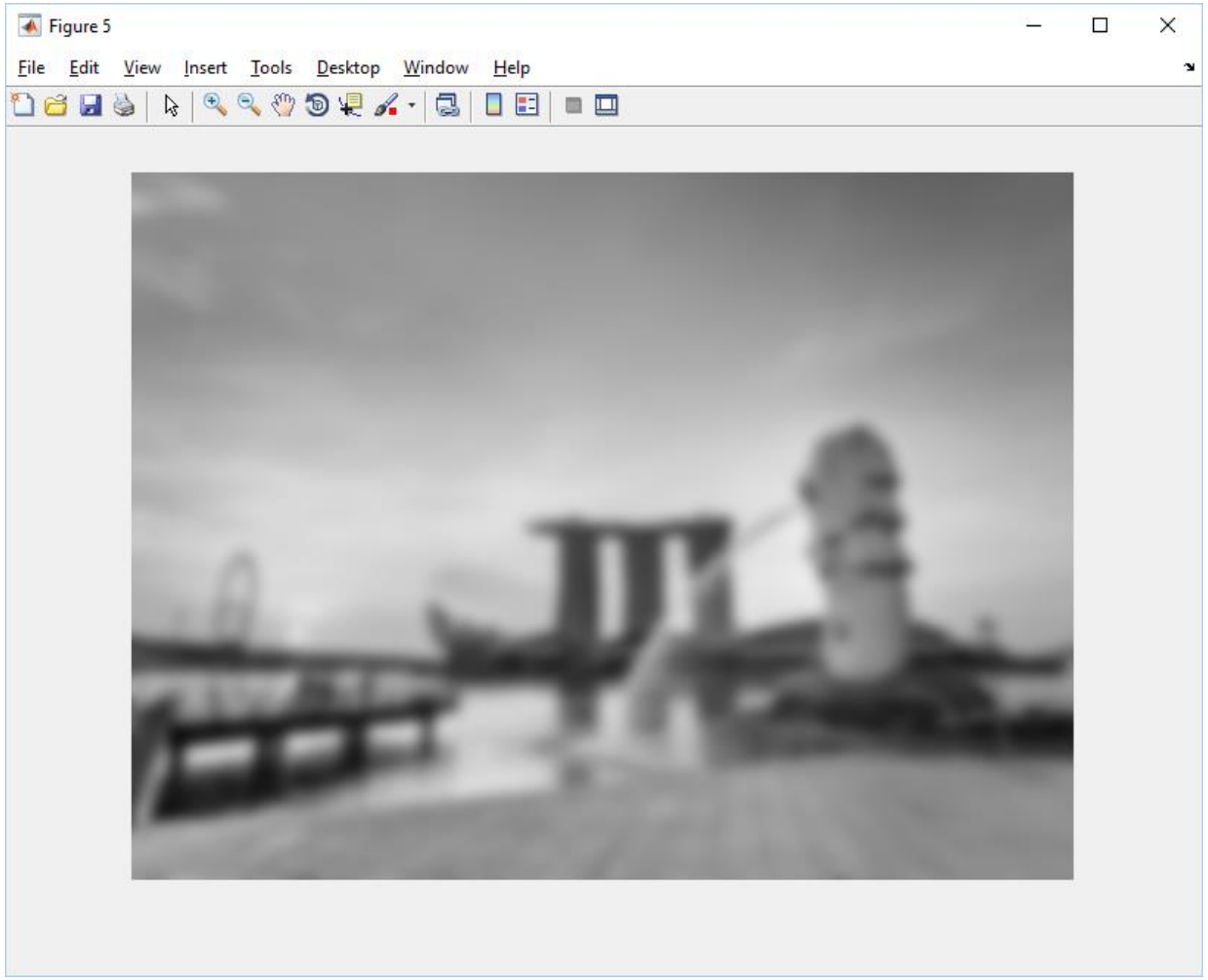
Apply filter on color image

```
img_sobel = imfilter(img, kernel, 'replicate');
figure, imshow(img_sobel);
```



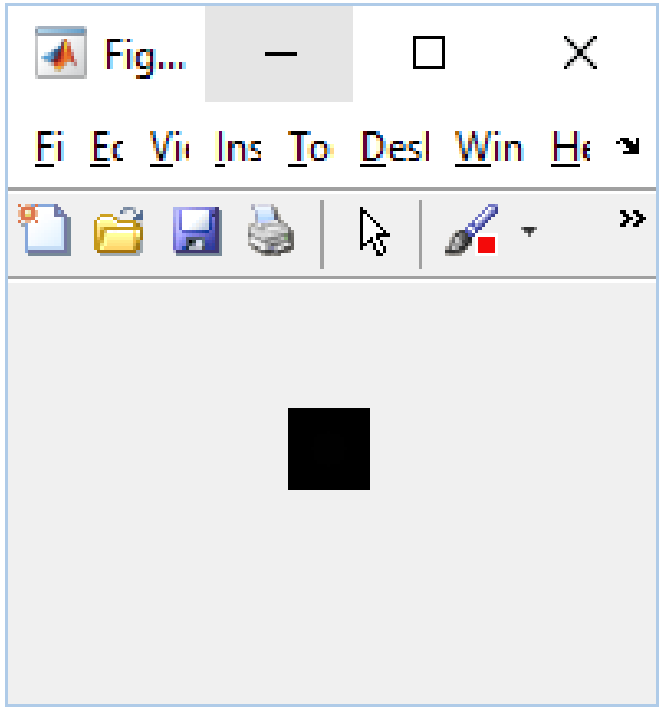
Apply Gaussian filter

```
gaussian_kernel = fspecial('gaussian', [25 25], 5);

img_gray_gaussian = imfilter(img_gray, gaussian_kernel, 'replicate');

figure, imshow(img_gray_gaussian);
```



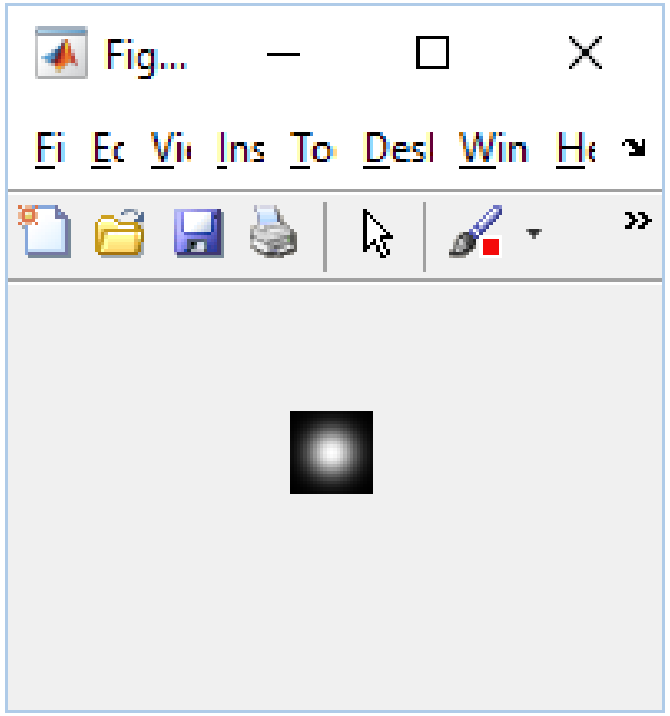
Display Gaussian kernel

figure,imshow(gaussian_kernel);



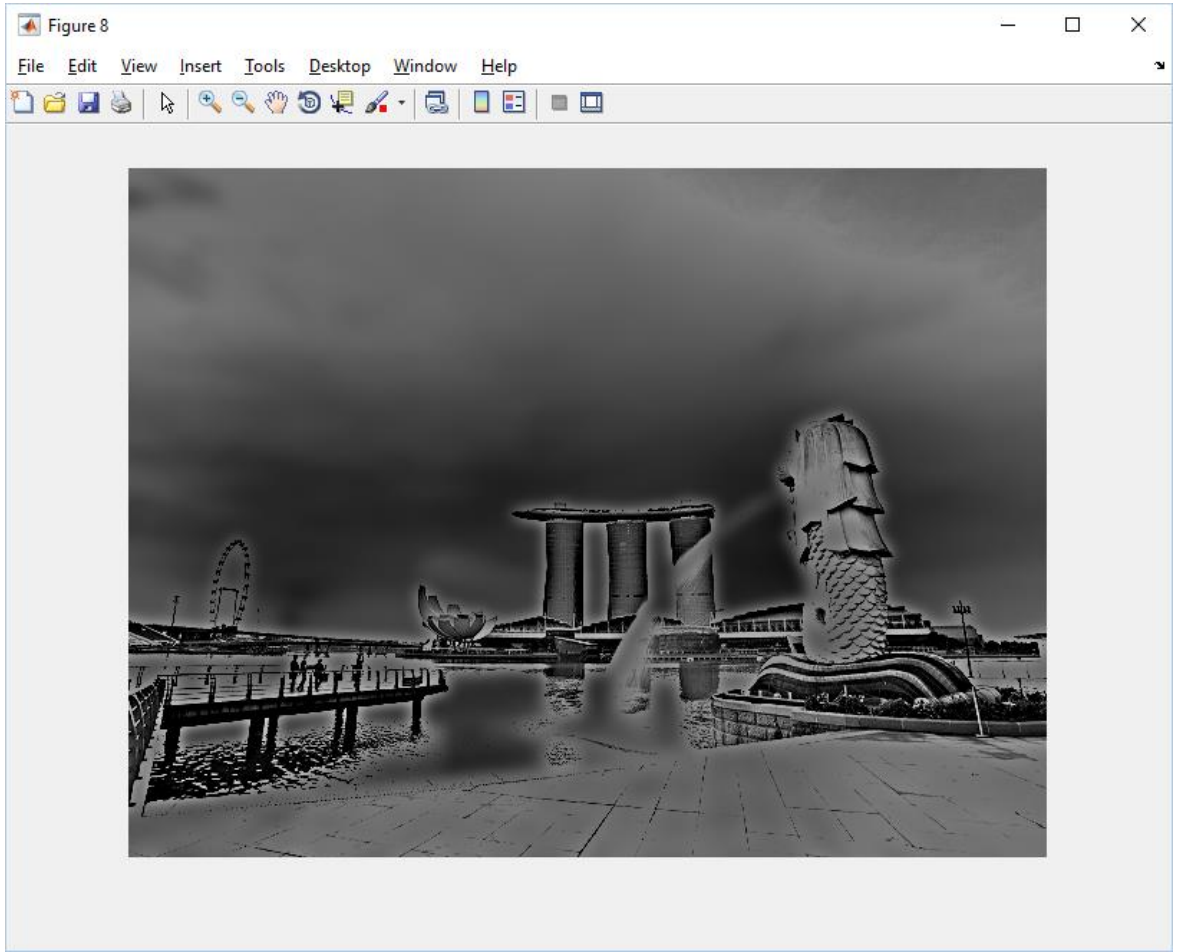
Display Gaussian kernel

figure,imshow(gaussian_kernel, []);



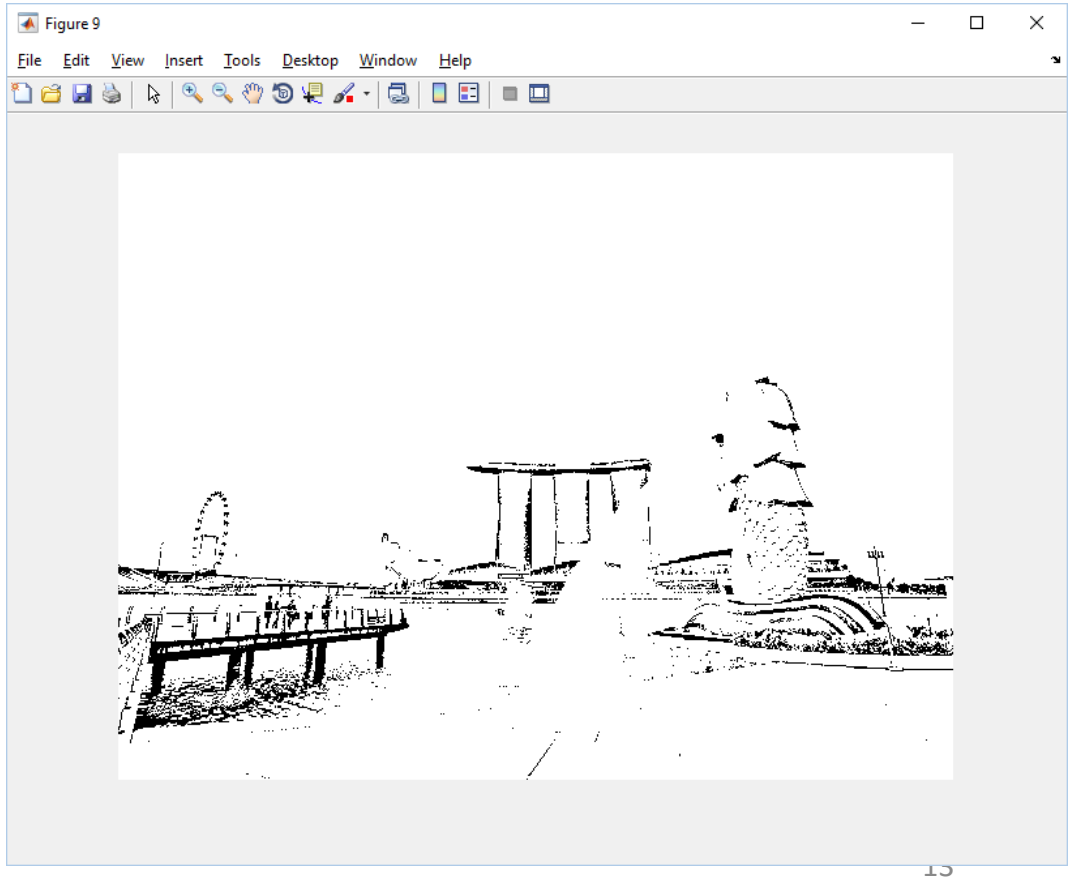
Create sharpened image

```
img_sharpened = img_gray * 2 - img_gray_gaussian;
figure, imshow(img_sharpened);
```



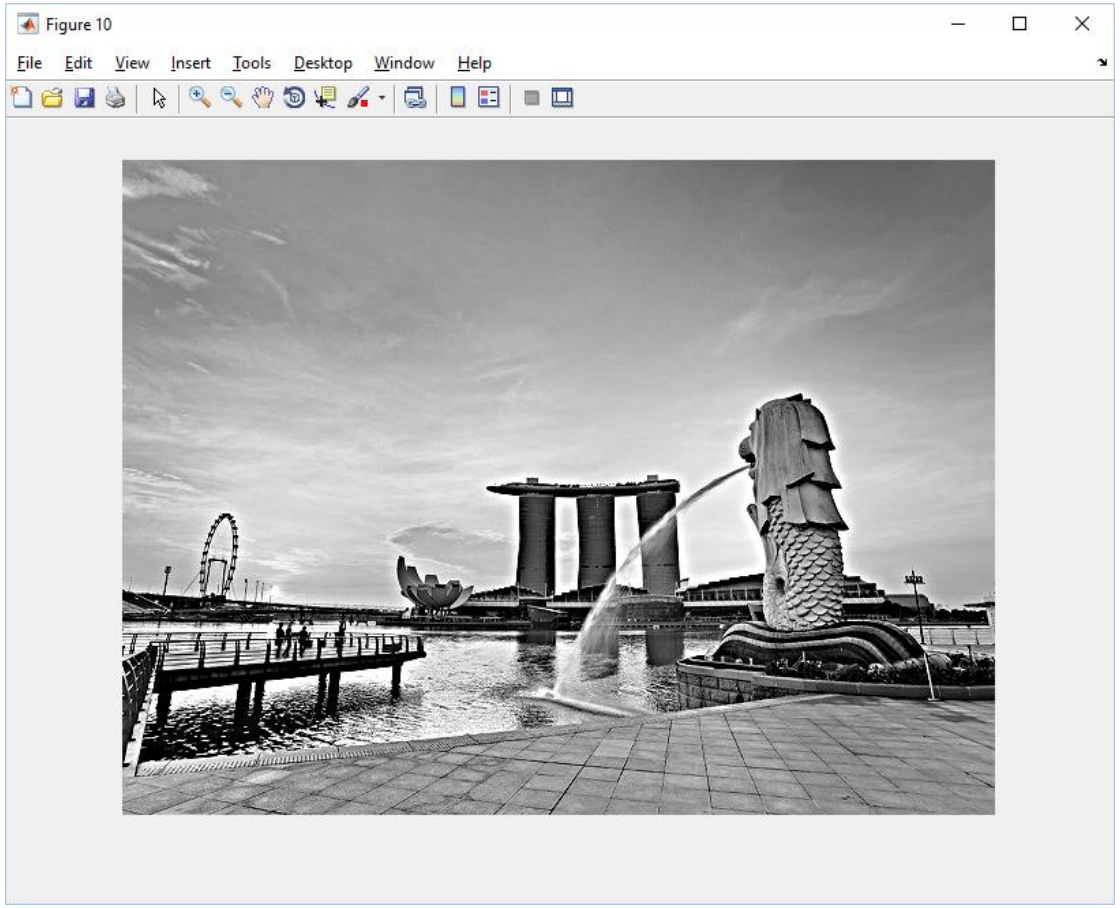
Create sharpened image

```
img_sharpened2 = double(img_gray) * 2 - double(img_gray_gaussian);
figure, imshow(img_sharpened2);
```



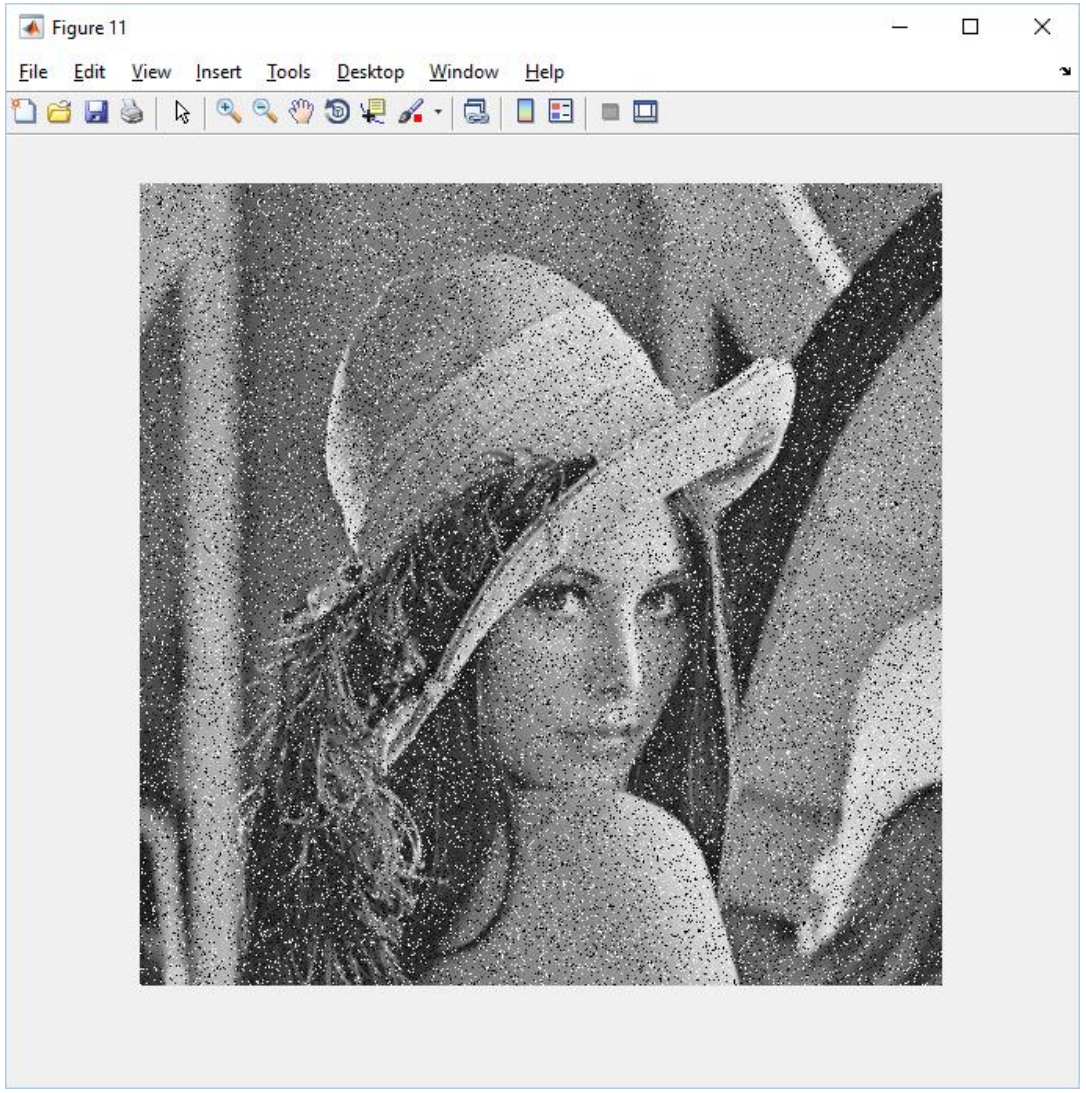
Create sharpened image

```
img_sharpened3 = uint8(img_sharpened2);
figure, imshow(img_sharpened3);
```



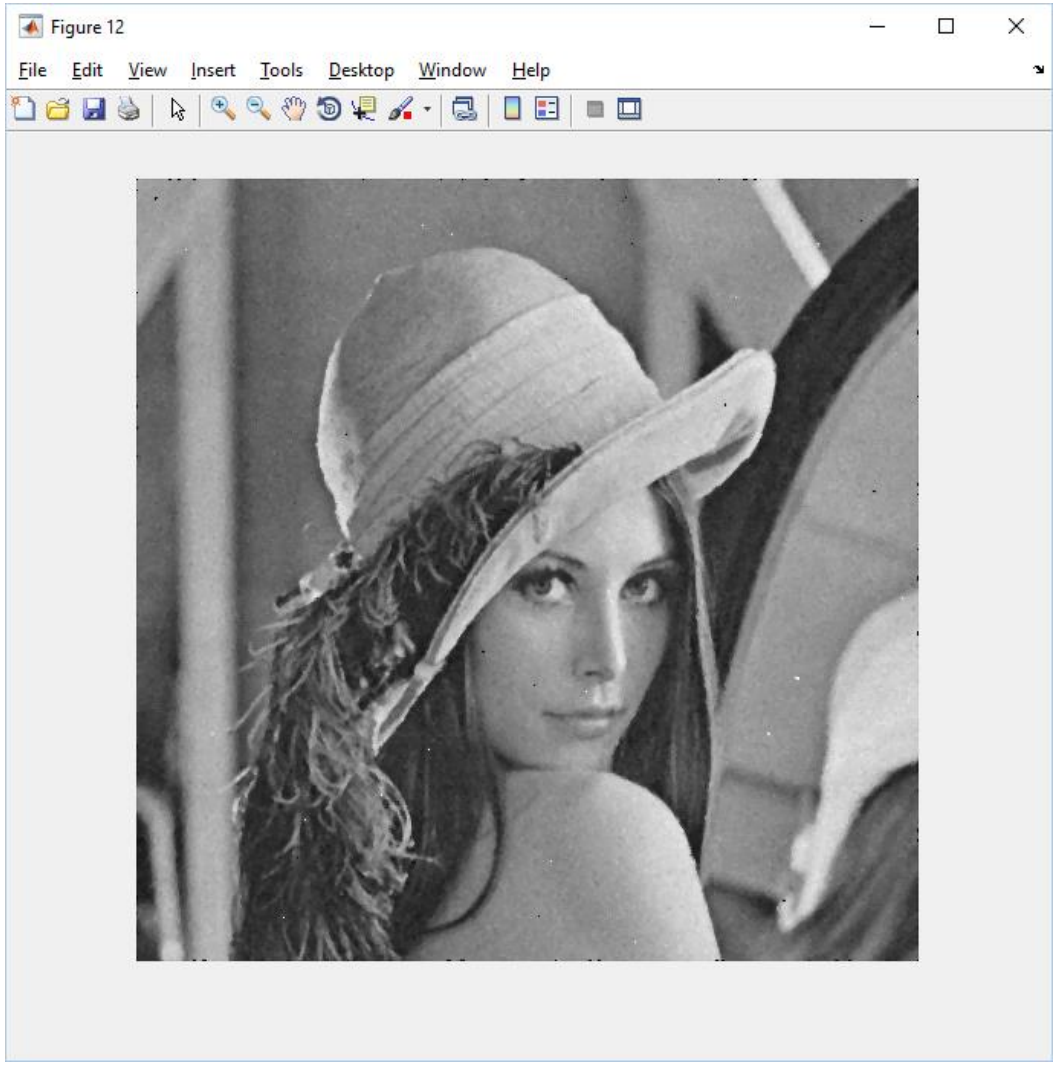
Load image with noise

```
img_noise = imread('salt_and_pepper.jpg');
figure, imshow(img_noise);
```



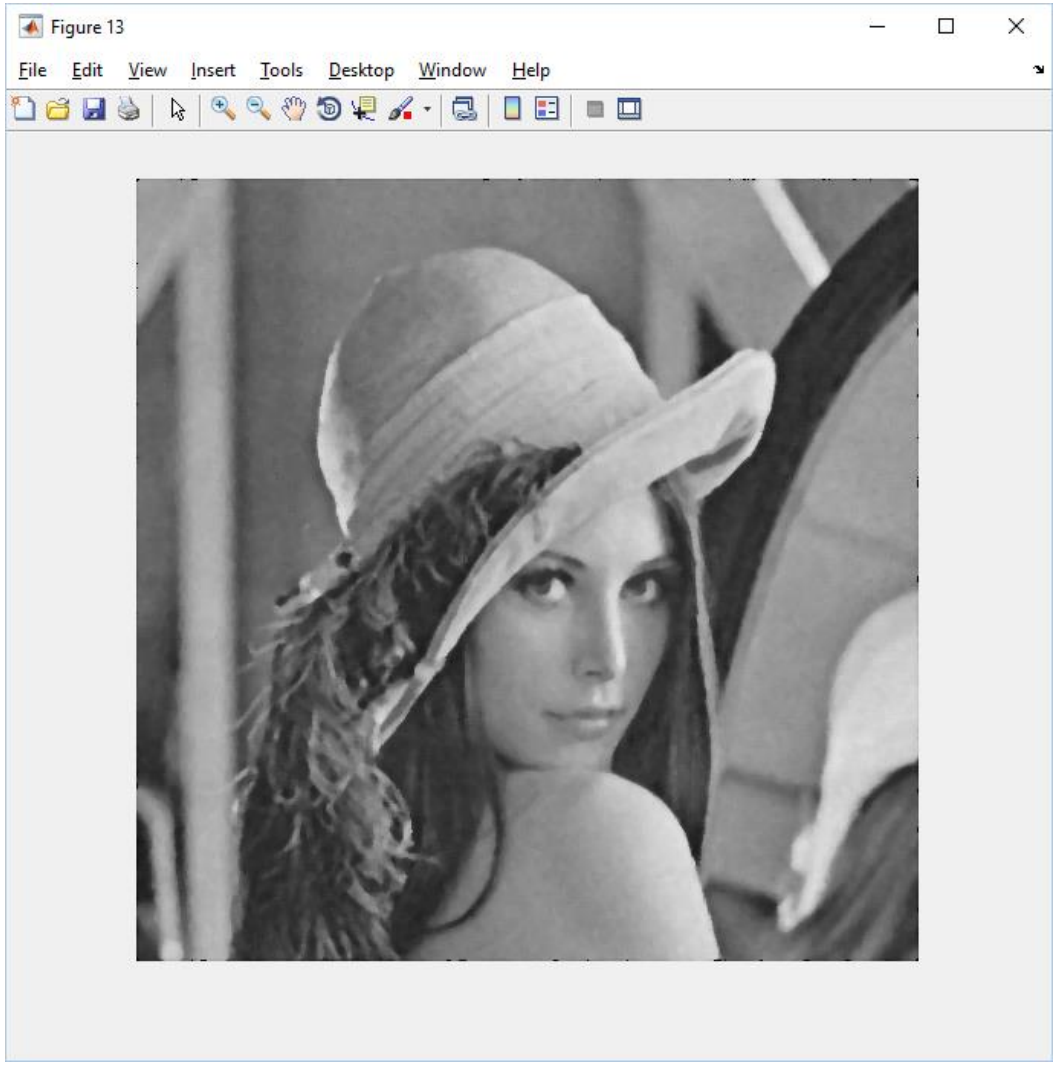
De-noising with median filter

```
img_denoise = medfilt2(img_noise);
figure,imshow(img_denoise);
```



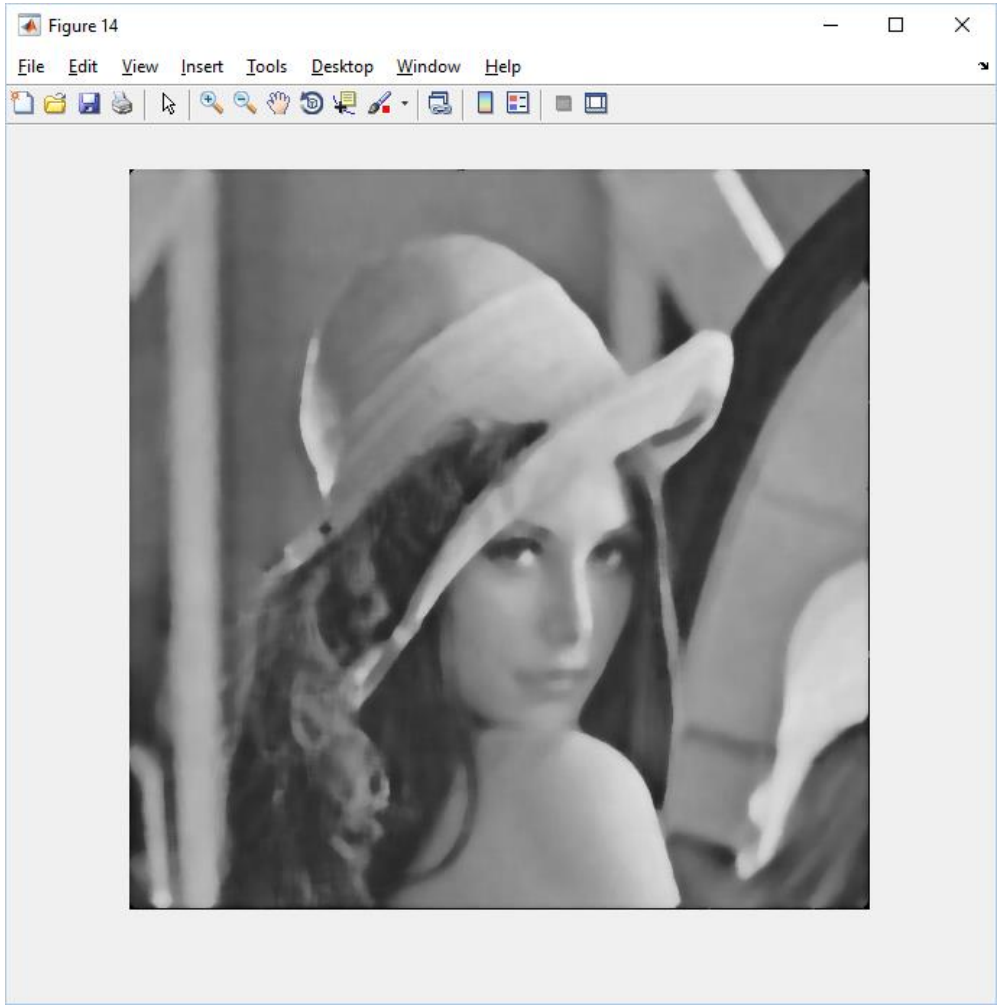
De-noising with median filter

```
img_denoise = medfilt2(img_noise,[5 5]);
figure,imshow(img_denoise);
```



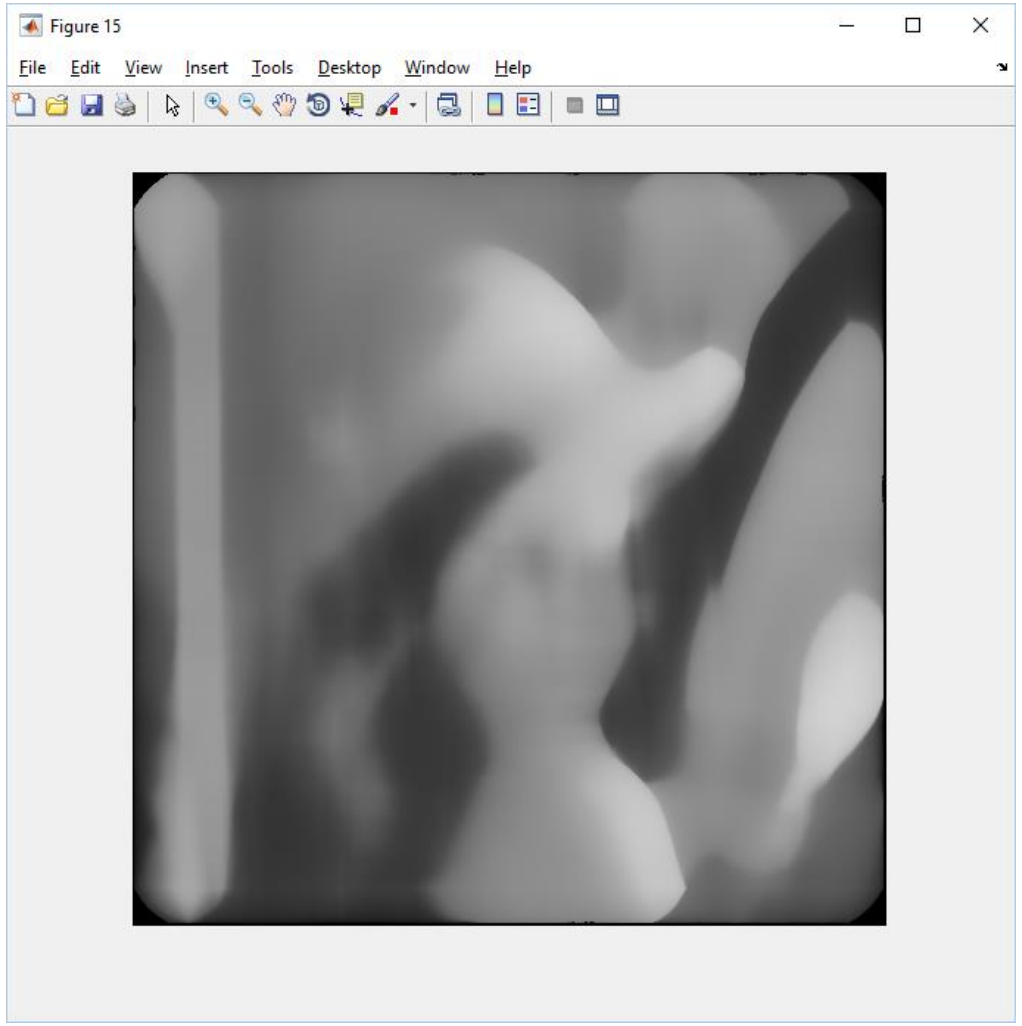
De-noising with median filter

```
img_denoise = medfilt2(img_noise,[10 10]);
figure,imshow(img_denoise);
```



De-noising with median filter

```
img_denoise = medfilt2(img_noise,[50 50]);
figure,imshow(img_denoise);
```



Q&A