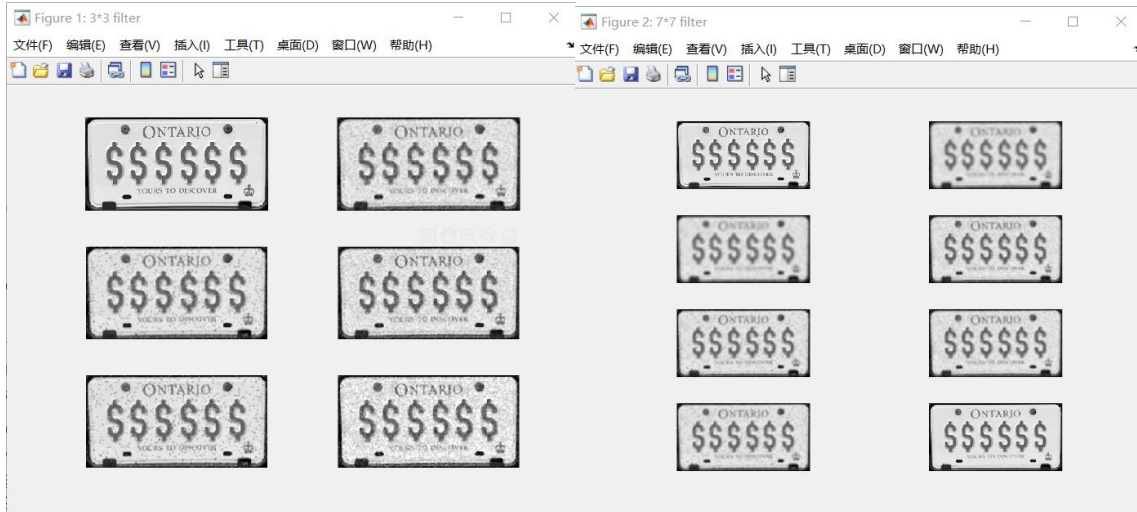
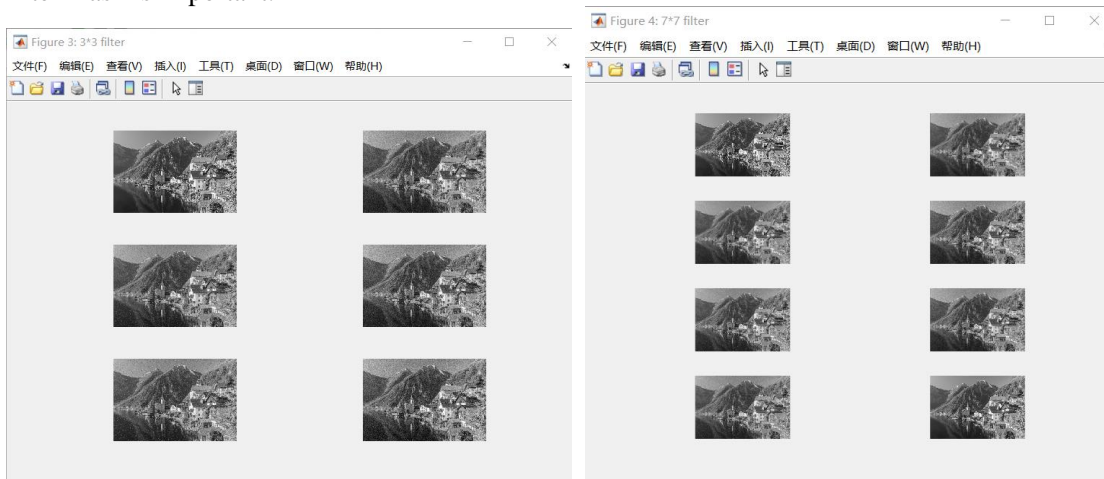


## Assignment2

1. Compare the filtered images (with each type of mask) with the original and the noisy images respectively for Gaussian noise and salt-and-pepper noise.

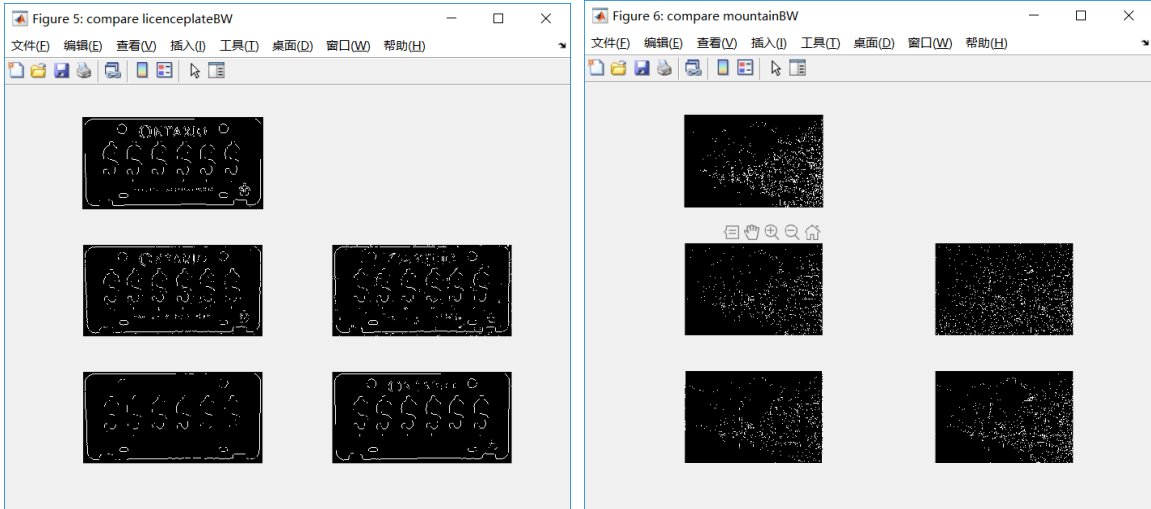


As you can see in the above two pictures, the first image in both pictures is original image. The images in the first picture are filtered by 3\*3 filter. The clearest image is image with Salt-and-Pepper noise filtered by Directional averaging filter. The images in the second picture are filtered by 7\*7 filter. The clearest image is image with Salt-and-Pepper noise filtered by median filter. For Gaussian noise, noise removal performance of Gaussian filter is best. For salt-and-pepper noise, noise removal performance of median filter is best. Generally, 7\*7 filter is better than 3\*3 filter, so the the size of the filter mask is important.



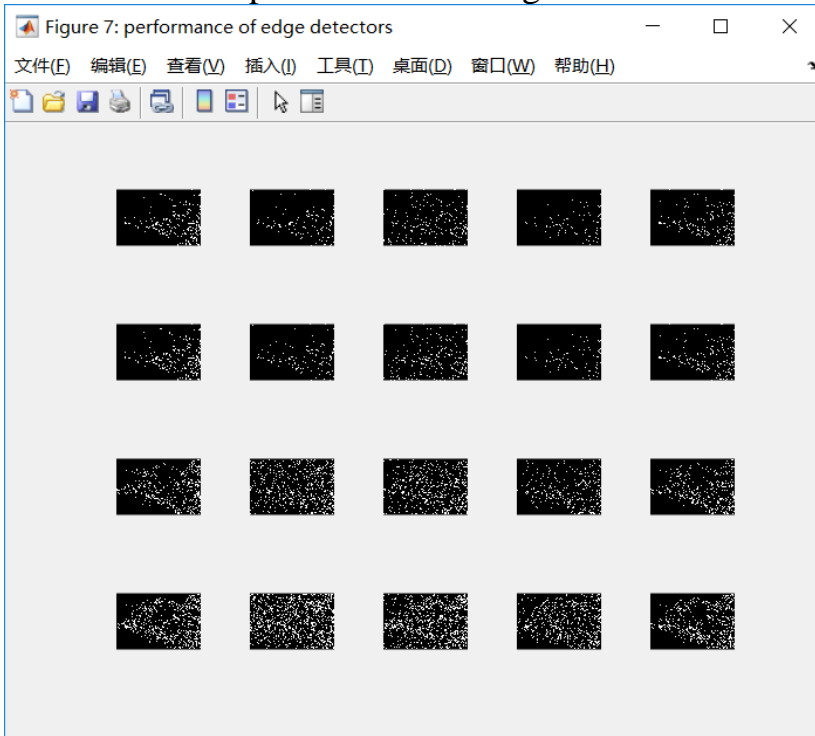
Repeat the same step on mountainBW.jpg, we get the same conclusion.

2. Compare the results of edge detection between these 5 edge images.



As you can see in above picture, the original image with Gaussian noise show the best performance of edge detection and the original image also show a good performance of edge detection. On the contrary, the original image with Gaussian noise show the worst performance of edge detection. Examine the performance of edge

### 3. Examine the performance of edge detectors.



As we can see in above picture, Sobel and Prewitt edge detection works best when there is no noise. Sobel and Prewitt edge detection works best when the picture has Gaussian noise. None of these four edge detection works well then the pictures has S&P noise. In the remaining two cases, Sobel and Prewitt edge detection is still better. Generally, Laplacian operator is sensitive to noise, Sobel and Prewitt edge detection is better.