Practical 3 : Image Filtering

1- Salt and pepper noise generation

- Write a program that generates p% of uniform black and white noise on 'lena_gray'
- With a convenient library, try this command and compare the result :

```
sp = random_noise(I, mode='s&p', seed=None, clip=True)
```

2- Mean filtering

- Write a program that carry out a mean filter of size 3x3
- Apply this filter on your noised image of part 1
- What is its effect

3- Median filtering

- Modify some code lines of your mean filtering program to perform a median filter with a structured element of size 3x3
- Compare the time running of the two filters programs
- Apply this filter on your noised image
- What is its effect with comparison with the mean filtering
- Play with the size of the two filters and note the differences (for that, it is maybe better to great your own functions for each filter)
- Use the python filtering functions (ex. convolve,…) and handle the padding, the filter size and the filter type and compare with your handwriting codes.

4- Gaussian filtering

- Write a function that perform a gaussian filtering with a variable sigma
- Apply it to filter your noised image

5- Checking

- Use the python filtering functions (ex. convolve,…) and handle the padding, the filter size and the filter type and compare with your handwriting codes.
- Apply your function on the given different noised images
- Note the result of each filter and compare