TP2
Local Filtering and Histograms

In this practical work, we study local filtering and image improvements through histogram modifications.

1 Exercise 1 : Filtering

- Write a c program that reads a PGM image and compute the image smoothed with the following binomial filter:

$$b_{2,2}(m,n) = \frac{1}{16} \begin{matrix} 1 & 2 & 1 \\ 2 & 4 & 2 \\ 1 & 2 & 1 \end{matrix}$$

  Try on grenoble_noise.pgm.

- Add the option to smooth n times as well as the option to smooth with a filter of dimension 5x5 (binomial coefficients can be obtained from the pascal triangle).

- Implement a median filter and compare it with the binomial filters.

2 Exercise 2 : Histograms

- Add to the previous program a function that computes the intensity histogram. This histogram will be represented by an array of dimension the maximal number of grayscale intensities (i.e. 255).

- Modify the program so that it computes the image transformed with a histogram stretching.

- Modify the program so that it computes the image transformed with a histogram equalization.

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