**Exercise 3: Spatial filtering**

Spatial filtering is an image processing technique that modulates the intensity of a pixel-based on its neighbors' brightness.

It can be used to eliminate background noise, sharpen edges, and adjust the illumination.

In this practice, we will learn how to employ a basic spatial filtering strategy.

**Exercise goal:**

* Understand how to use simple spatial filtering algorithms.
* Examine the effects of various filter kernels/masks.
* **Task 1:** 
  + Image smoothing using correlations
  + To smooth out the provided image (test03.jpg) apply a 3×3 filter mask. Remember to pad the input image with zeros before smoothing.

(MATLAB functions: imfilter(), padarray(x, [2 2]))

* You can also experiment with filter masks of various sizes (e.g., 5\*5, 10\*10, etc.) to see how different filters affect the image

Put the generated images in the report and explain why the varying mask sizes have such an impact.

* **Task 2:**
* Using Laplacian filter to sharpen image
* Transform the image (test03\_b.jpg) into gray scale
* Then use a Laplacian filter mask to sharpen the image

(Laplacian filter values: [[0 1 0], [1 -4 1], [0 1 0]])

* You can also try other filter masks to see how they impact the outcome

Put the generated images in the report using Laplacian and other filters