

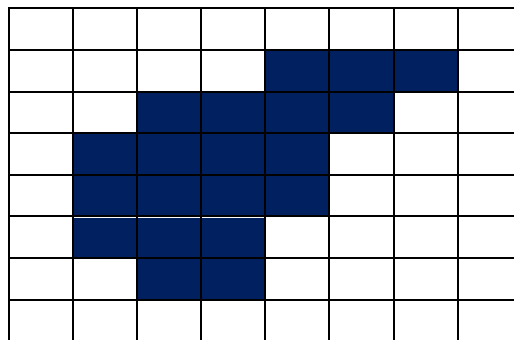
## IMAGE PROCESSING

### Labwork 3: Edge Detection, Segmentation and Morphology

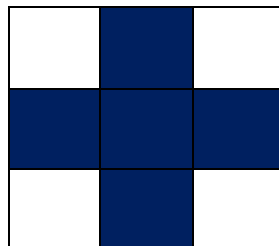
#### Part 1. Use a pen and paper to perform the following tasks:

Given the following image I and the structuring element S.

**Image I:**



**Structuring element S:**



- Compute the erosion of image I by the structuring element S
- Compute the dilation of image I by the structuring element S
- Compute the opening of image I by the structuring element S
- Compute the closing of image I by structuring element S

## **Part 2. Use OpenCV and Python to do the following tasks:**

- Download from the Internet some greyscale images for your work.

**Task 1:** Load an image, then apply Laplacian filter using the function *cv2.Laplacian()* and Sobel filter using the *function cv2.Sobel()* to detect edges of the loaded image. Display the original images and the highlighted images to see the difference.

**Task 2:** Use the function *cv2.Canny()* to detect edges of the loaded image. Compare the results with Laplacian filter and Sobel filter in Task 1.

**Task 3:** Use the function *cv2.HoughLines()* to detect lines in the loaded image. Display the detected lines using the function *cv2.line()*.

**Task 4:** Perform image segmentation on the loaded image. Compare the results with global thresholding by some pre-defined thresholds *k*.

**Note:** you are required to upload the captured photos and the source codes of your lab works to the google drive folder of the DIP course.