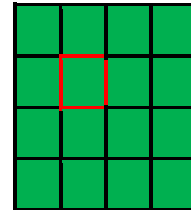
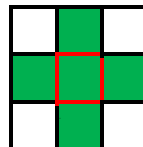
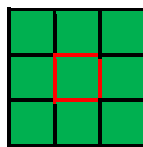


1. The src folder includes the new class “Morphology”.
2. Implement the dilation operator in function `void Morphology::dilate(...)`.
3. Implement the erosion operator in function `void Morphology::erode(...)`.
4. Implement the function `void Morphology::subtract(const cv::Mat &input, cv::Mat &output, const cv::Mat &subtract)` which subtracts the matrix “subtract” from the matrix “input” and writes the result into the matrix “output”.

Note: All three matrices are of type UCHAR.

Appendix

Reference point (red):



Dilation:

$$F \oplus M = \{ \underline{p} : M_{\underline{p}} \cap F \neq \emptyset \}$$

Erosion:

$$F \ominus M = \{ \underline{p} : M_{\underline{p}} \subseteq F \}$$

Boundary Extraction:

$$B = F \setminus (F \ominus M)$$

with

F – set of all foreground pixels (binary image: white)

M – set of all mask pixels with grey value greater than zero

\underline{p} – current pixel in the image

$M_{\underline{p}}$ – shifted mask with the reference point moved to pixel \underline{p}

B – boundary image