DILATION AND EROSION

Morphology

1. Morphology generally concerned with shape and properties of objects.
2. Used for segmentation and feature extraction.
3. Two basics operations
   i. erosion
   ii. dilation

Dilation and Erosion.

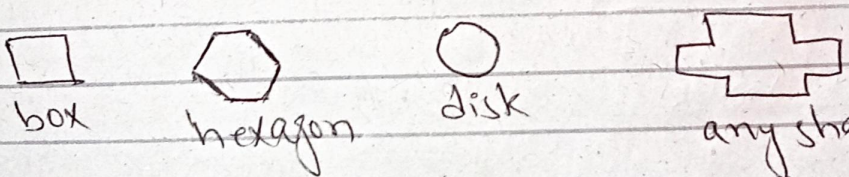
Dilation :- Adds pixels to the boundaries of objects in an image.

Erosion :- Removes pixels on object boundaries.

Structuring element :- The number of pixels added or removed from the objects in an image depends on the size and shape of the structuring element used to process the image.

→ A structuring element is a shape mask used in basic morphological operations.

→ They can be any shape and size that is digitally representable, and each has an origin.



box(length, width) disk(parameter)

Dilation (A+B) A: Image Segment
B: Structuring Element

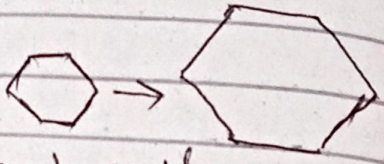
- Fills in holes
- Smoothes object boundaries.

• Adds an extra outer ring of pixels onto object boundary, i.e objects becomes slightly larger.

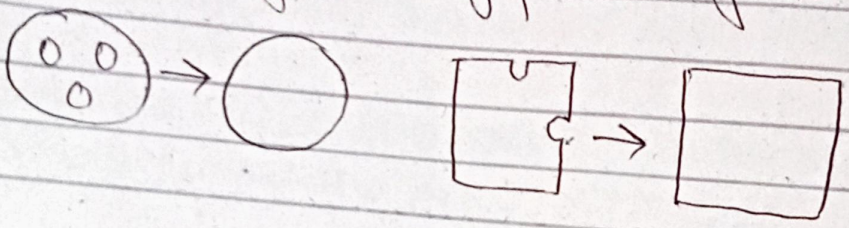
→ Dilation expands the connected sets of 1s of a binary image.

It can be used for

1. expanding shapes:



2. filling holes, gaps and gulfs.



0	0	0	1	1
1	1	1	0	0
0	0	1	0	0
0	0	0	0	0
0	0	0	0	0

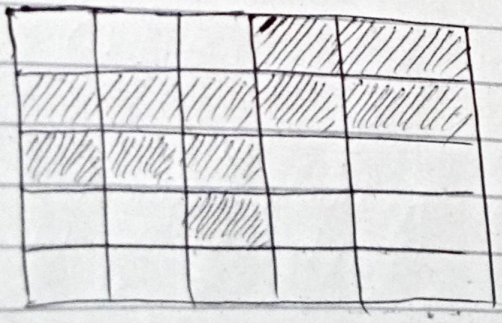
Input Image

origin

1
1

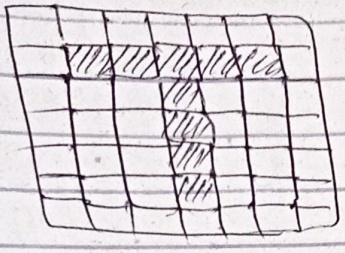
structuring element

A+B



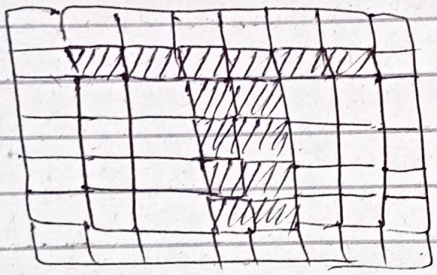
Structuring Element for Dilation

Example



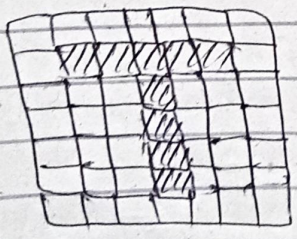
Structuring Element

Image

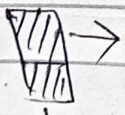


Results

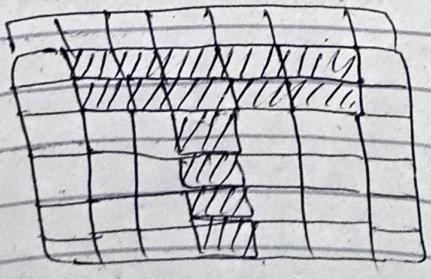
Example



Image



Structuring Element



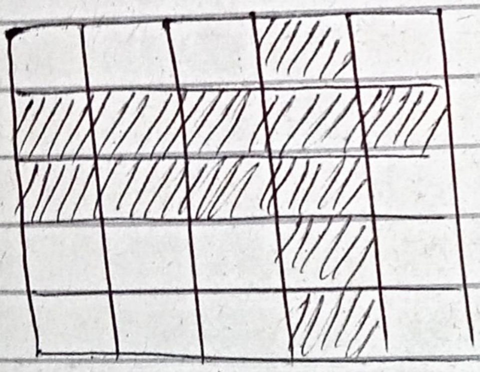
Result

Erosion (A-B)

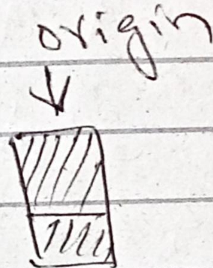
A = Image Segment
B = Structuring Element

Typical Uses of Erosion

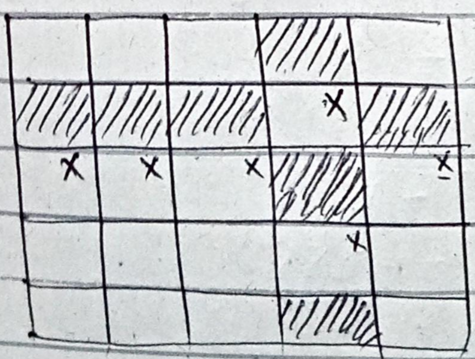
1. Removes isolated noisy pixels.
2. Smoothes object boundary.
3. Removes the outer layer of objects pixels i.e object becomes slightly smaller.



Input Image A



Structuring Element B



Result.

——— X ——— X ———