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EE 146 HW 1 Jesse Layman SID: 861135479

```
% Professor: Bir Bhanu,
% TA: Vincent On,
% EE 146 - 001
close all
clear all

% 9.1
I = [0 0 0 0 1 0
      0 1 1 1 1 1
      1 0 1 1 1 1
      1 1 0 1 1 0
      0 0 1 0 1 0
      0 0 0 1 0 0]

   H1 = [1 0 0;0 1 0;0 0 1]
 H2 = [0 1 0;1 1 1;0 1 0]
  % Dilate H1 complete
 H1I = [1 1 1 1 1 0
           0 1 1 1 1 1
           1 0 1 1 1 1
           1 1 0 1 1 1
           0 1 1 0 1 1
           0 0 1 1 0 1]
% Dilate H2 complete
  H2I = [0 1 1 1 1 1
           1 1 1 1 1 1
           1 1 1 1 1 1
           1 1 1 1 1 1
           1 1 1 1 1 1
           0 0 1 1 1 0]

% Erode H1
EH1I = [ 0 0 0 0 1 0
             0 0 0 0 0 1
             1 0 1 1 0 1
             0 1 0 1 0 0
             0 0 1 0 0 0
             0 0 0 1 0 0 ]
% Erode H2
EH1I = [ 0 0 0 0 0 0
             0 0 0 0 1 0
             0 0 0 1 1 0
```

```
             0 0 0 0 0 0
             0 0 0 0 0 0
             0 0 0 0 0 0 ]

I =
     0     0     0     0     1     0
     0     1     1     1     1     1
     1     0     1     1     1     1
     1     1     0     1     1     0
     0     0     1     0     1     0
     0     0     0     1     0     0
H1 =
     1     0     0
     0     1     0
     0     0     1
H2 =
     0     1     0
     1     1     1
     0     1     0
H1I =
     1     1     1     1     1     0
     0     1     1     1     1     1
     1     0     1     1     1     1
     1     1     0     1     1     1
     0     1     1     0     1     1
     0     0     1     1     0     1
H2I =
     0     1     1     1     1     1
     1     1     1     1     1     1
     1     1     1     1     1     1
     1     1     1     1     1     1
     1     1     1     1     1     1
     0     0     1     1     1     0
EH1I =
     0     0     0     0     1     0
     0     0     0     0     0     1
     1     0     1     1     0     1
     0     1     0     1     0     0
     0     0     1     0     0     0
     0     0     0     1     0     0
EH1I =
     0     0     0     0     0     0
     0     0     0     0     1     0
     0     0     0     1     1     0
     0     0     0     0     0     0
     0     0     0     0     0     0
     0     0     0     0     0     0
```

9.2

using this shape

```
HC = [ 1 1 1; 1 0 0; 1 1 0]
% First erode, then dilate
```

```
HC =
     1     1     1
     1     0     0
     1     1     0
```

10.8

Exercise 10.8. While computing the convex hull of a region, the maximal diameter (maximum distance between two arbitrary points) can also be simply found. Devise an alternative method for computing this feature without using the convex hull. Determine the running time of your algorithm in terms of the number of points in the region.

```
% Find boundry, compute distance between pixels, find max distance.
% MN+MN+MN = 3MN
```

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