

[P.1] Write a code to generate a chain code corresponding to a closed digitized curve, assuming that the curve is 8-connected.

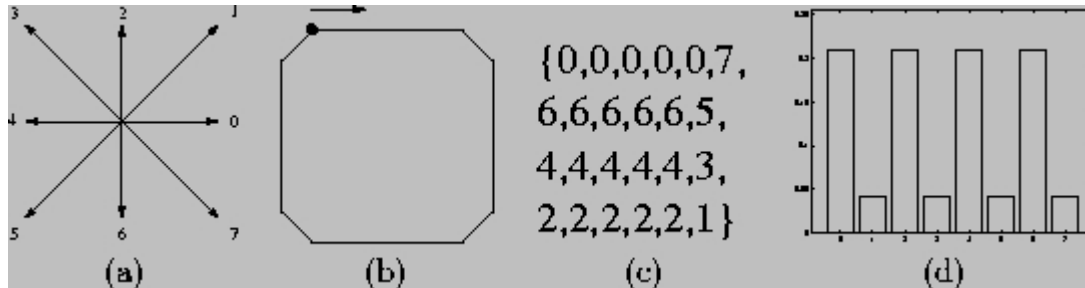


Figure 1: (a) Directions (b) A closed curve (c) A chain code (d) Corresponding histogram

Read the shapes in images `p1_*.bmp` and generate chain codes corresponding to each of them. Read below and try to come up with an implementation which will compare the shapes. You are supposed to write a code which takes two shapes (images) as input and in suggests the similarity between two shapes in the output.

(**Hint:** Chain code will be a sequence of numbers in the range  $\{0, 1, \dots, 7\}$ . A way to compare two chain codes is to look at the normalized histograms of the corresponding sequences. Note that the normalization removes the effect of scaling. To take care of rotations we may align the histograms by cyclic shifts so that the maximum in the histogram appears first. Think about it. Now we are ready to compare two shapes! <http://www.bmva.org/bmvc/1997/papers/062/node2.html> )

[P.2] From the image of a book text below

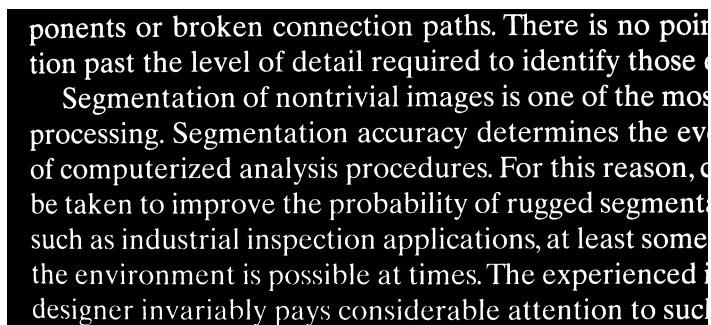


Figure 2: book\_text.png

1. Remove the characters touching the boundary of the image.
2. Identify characters with long vertical strokes like 'p, t, d, h, ...'

[P.3] Define medial axis of an object. For planar object in `p2_1.bmp` compute the medial axis.

(**Hint:** The skeleton(morphological idea) of the object may help! )

[P.4] Try to restore the following images: `blurlenna.jpg`, `blurnoisylenna.jpg` and `blurnoisylenna2.jpg`. The degradation function is the same as in Lab-7. Try and compare results obtained using different restoration methods we have learnt.

You will find all the images in the `lab-exam` folder.