DIP Homework Assignment #4

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繳交日期：2016.5.31

**Execution**

To reproduce the result, simply execute README.m under Matlab environment.

**Problem 1: Shape Analysis**

Sample1.raw is a gray-level image that contains some characters. Please design an algorithm to recognize different characters and count the number of occurrence of each character using TrainingSet.raw as the training set. Please provide the flow chart and details of your algorithm, and discuss the result in the report.

**Problem 2: Morphological Processing**

Given a binary image Sample2.raw, please try to produce the same images as illustrated in Fig. 4 by adopting appropriate morphological processing. Please describe the designed algorithm in detail for each case.

**Problem 3: Texture Analysis**

Let’s denote Sample.raw as I. Please generate several images by the instructions below.

1. Transfer I to frequency domain by DFT (Discrete Fourier Transform) with centering and output the result as D.
2. Apply an ideal low-pass filter to D with and . Output results as and , respectively.
3. Apply a Gaussian low-pass filter to D with and . Output results as and , respectively.
4. Transfer , , , and back to spatial domain by Inverse DFT. Please compare the results and provide some discussions in the report.