

## CS5190 Spring 2024 - Assignment 2

Total points: 25

Due date: Monday, March 25, 2024

### (25 pts) Task: Contour Detection

Figure 1 shows a given image of size 812 by 639 which consists of many different characters. When you download this assignment, you could find this image “fig1.jpg” in the folder.

In this assignment, you’re asked to use OpenCV functions to **find contour of each character**. Figure 2 shows an example of the expected result. You are allowed to use any OpenCV functions for this task.

Please note that the given input image has a rectangular box, as indicated in Figure 3. **The expected result should NOT include the contour of this rectangular box**. (Hint: sort the list of detected contours based on contour area, and exclude the contour of the rectangular box)

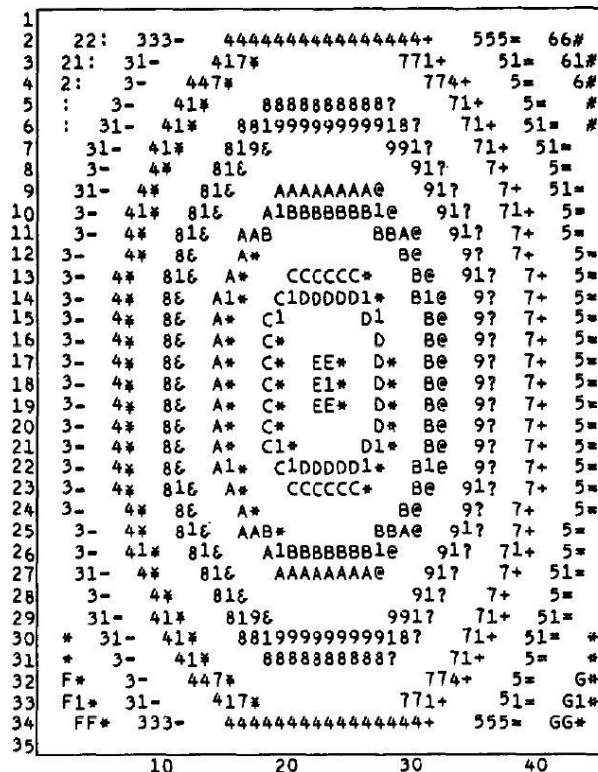


Figure 1. Input Image

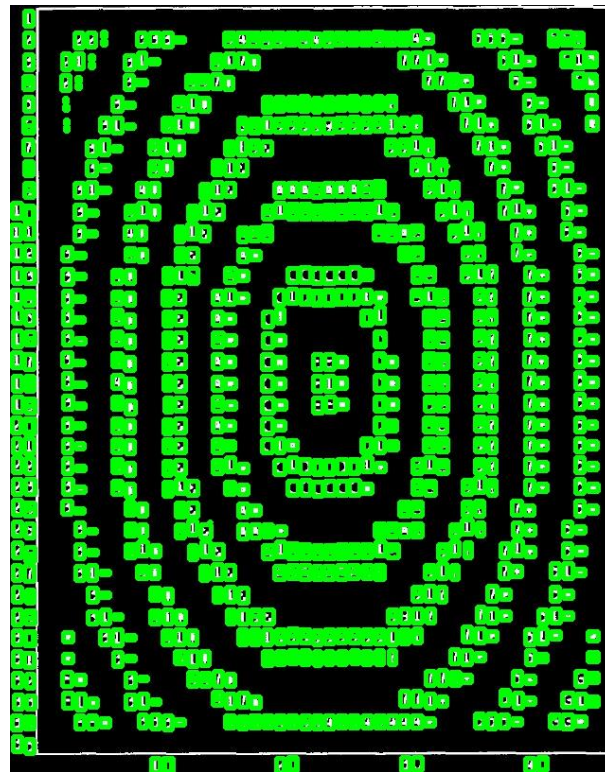


Figure 2. Expected Result

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1  22: 333- 4444444444444444+ 555= 66#
2  21: 31- 417* 771+ 51= 61#
3  2: 3- 447* 774+ 5= 6#
4  : 3- 41* 8888888888? 71+ 5= #
5  : 31- 41* 8819999999918? 71+ 51= #
6  31- 41* 819E 991? 71+ 51=
7  3- 4* 81E 91? 7+ 5=
8  31- 4* 81E AAAAAAAAA@ 91? 7+ 51=
9  3- 41* 81E ABBBBBBBBle 91? 71+ 5=
10 3- 4* 81E AAB BBAE 91? 7+ 5=
11 3- 4* 8E A* Be 9? 7+ 5=
12 3- 4* 81E A* CCCCCC* Be 91? 7+ 5=
13 3- 4* 8E A1* C1DDDD1* B1e 9? 7+ 5=
14 3- 4* 8E A* C1 D1 Be 9? 7+ 5=
15 3- 4* 8E A* C* D Be 9? 7+ 5=
16 3- 4* 8E A* C* EE* D* Be 9? 7+ 5=
17 3- 4* 8E A* C* E1* D* Be 9? 7+ 5=
18 3- 4* 8E A* C* EE* D* Be 9? 7+ 5=
19 3- 4* 8E A* C* D* Be 9? 7+ 5=
20 3- 4* 8E A* C1* D1* Be 9? 7+ 5=
21 3- 4* 8E A1* C1DDDD1* B1e 9? 7+ 5=
22 3- 4* 81E A* CCCCCC* Be 91? 7+ 5=
23 3- 4* 8E A* Be 9? 7+ 5=
24 3- 4* 81E AAB* BBAE 91? 7+ 5=
25 3- 41* 81E ABBBBBBBBle 91? 71+ 5=
26 31- 4* 81E AAAAAAAAA@ 91? 7+ 51=
27 3- 4* 81E 91? 7+ 5=
28 31- 41* 819E 991? 71+ 51=
29 * 31- 41* 8819999999918? 71+ 51= *
30 * 3- 41* 8888888888? 71+ 5= *
31 F* 3- 447* 774+ 5= G#
32 F1* 31- 417* 771+ 51= G1#
33 FF* 333- 4444444444444444+ 555= GG#
34
35

```

10                  20                  30                  40

Figure 3. The rectangular box in the given input image.

### What to Submit?

1. Python source codes in **“.ipynb”** format. Please note that
  - a. don't use .py format
  - b. use **relative file paths** to load (save) images from (to) disk.
  - c. comment some important code lines,
2. Input images used.
3. Output images generated.
4. Please zip all documents as yourname\_assignment2.zip and submit it on Canvas.