Lab Exam

The delivered report is very important in grading, please illustrate everything clearly.

Notes & Hints:

1. Make sure you solve all the problems first, and then try to enhance more.

2. Before jumping into any complicated solution, take your time to think first. Most probably, the solution is simpler than you think.

3. Take your time in choosing the most appropriate method (and threshold/parameter - if applicable).

4. Your exam time is 60 minutes. Use it wisely.

5. Stick to the requirements and the delivery notes, any violation to delivery notes will be penalized even if your code is perfect.

6. Make sure to open the images and examine them well before solving.

7. **Take care of any needed conversions in image types or pixel value ranges.**

8. After the time is over, kindly leave your report and leave the room. Any further writing in the code or the document will be penalized.

9. No two problems should be solved in the same cell.

10. If the problem contains more than one image, solve it for all images as indicated in the question, and show the output for each Image.

11. Show all output image(s) clearly in each stage of the solution.

12. Make sure the image paths in the code are relative paths, so that your code can work even if it is moved.

13. This sheet and output images are very important in evaluation.

14. Don't forget to write your solutions here and to show the output in the notebook.

15. Deliver your report to the TA and put your notebook/images on a folder on your desktop named "IPLE_C_F2023_YOURNAME". The notebook should be named the same as the folder. Your name should be written as a comment in the start of the first cell of your notebook.

Questions

Do your best and solve as much as you can

[10] Question 1

For the given image (Q1.png), identify the existing issue(s). Use 2 different methods to solve each issue, clearly indicating your choice of parameters (if any). Comment on the result of each method (How does this method solve the issue?)

Issue(s): ….….……………………………………………………………………………………………

Issue	Method	Parameters	Comments

[20] Question 2

For the given image (Q2.png), you are required to retrieve the exact coordinates (x, y) of the three points (marked in red in Q2-Explain.png).

Hint:

cv2.HoughLinesP(image, rho, theta, threshold[, lines[, minLineLength[, maxLineGap]]])
Returns lines represented by two points (x1, y1, x2, y2).

What algorithm(s) did you use to detect the point coordinates?

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List down the coordinates of the three points.

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[20] Question 3

For the given image (Q3.png), use two different approaches to get the mask of the stone statue (foreground object), and then obtain a minimal representation of the mask. Refer Q3-Explain.png for the required target mask.

First approach:

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Second approach:

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What is a minimal representation of a mask? And how to obtain it?

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[10] Question 4

Create a grayscale image for each of the following plot as pixel intensity histogram:

- Linear line (x: [0, 255], y: [255, 0]).