**Lab 07**

|  |  |
| --- | --- |
| Name: | 陳柏霖 |
| Student ID: | B09611007 |
| Total Score: |  |

**Note:**

Most of the explanations in this lab is mandatory, However, giving reasonable explanations to your answer or programs will earn you partial credits when your answer is incorrect.

1. **Filters and Convolution (25 points, 5 points each question)**

|  |  |  |
| --- | --- | --- |
| # | Description | Score |
|  | Original image |  |
| a | Horizontal feature extraction |  |
| b | Diagonal feature extraction |  |
| c | Edge extraction |  |
| d | Vertical feature enhancement |  |
| e | Slight contours |  |

1. **Denoising a Picture (15 points)**

|  |  |  |
| --- | --- | --- |
| # | Description | Score |
| - | Be sure to show all your experiment result (e.g., image processing steps and output images) here.    My filter: bilateral -> Gaussian filter -> total variation |  |

1. **Properties of Convolution (20 points)**

|  |  |  |
| --- | --- | --- |
| # | Description | Score |
| 1 | Commutative:    Associative:    Distributive: |  |
| 2 | Morphological Filters. These include operations like dilation and erosion, which are used in image processing. They are non-linear operations that process the image based on the shape of a structuring element. |  |

1. **Image Segmentation and Color Space (20 points)**

|  |  |  |
| --- | --- | --- |
| # | Description | Score |
| - | Paste your result here and briefly describe your image processing procedure and approach. How do you think your results are?    Fan Area: 35496.0  1. cv2.inRange() to extract yellow region  2. GaussianBlur, erode, dilate  3. Sum the areas of top-3 contours  I think I extract the regions well since the yellow color is obvious in the image. |  |

1. **Document Scanner (20 points)**

|  |  |  |
| --- | --- | --- |
| # | Description | Score |
| - | Paste your result here and briefly describe your image processing procedure and approach. How do you think your results are?    1. covert the image into gray scale and apply GaussianBlur  2. use Canny to find contours and get the one with 4 vertices  3. transform the contour into the rectangular shap  4. binarization  I consider the result acceptable while recognizability of the text could be enhanced by the advanced text recognition algorithms. |  |