ĐẠI HỌC TÔN ĐỨC THẮNG TON DUC THANG UNIVERSITY	KHOA CÔNG NGHỆ THÔNG TIN KỲ THI GIỮA KỲ HỌC KỲ 1 NĂM HỌC: 2025 – 2026

ESSAY: Introduction to Digital Image Processing

CODE: 505060

I. Rules

- Each essay is conducted by a group of **one to three students**.
- The essay consists of 2 parts: the Programming part and the Report part.
- Only use OpenCV library and some basic Python libraries in the Programming part.

II. Programming part

This part is consist of two programing tasks. Here are the contents of the part:

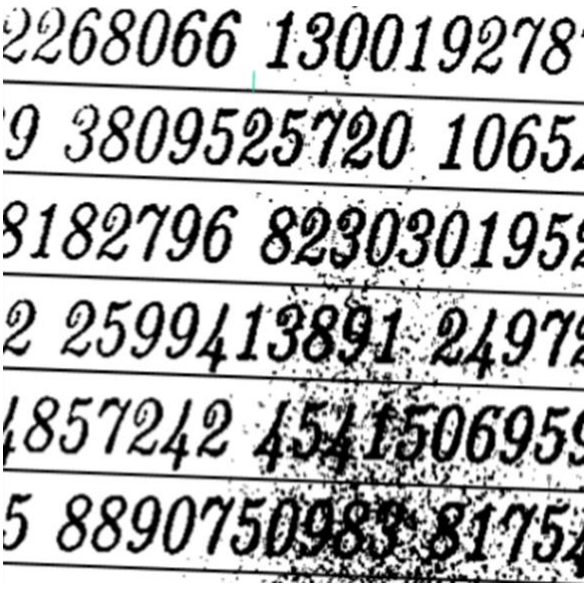
Programing Task 1 (3.0 points): Given an input video (attached in the assignment):

Video filename: **task1.mp4**

Draw rectangles surrounding each Traffic sign in all frames of the input video automatically, and save the outputs into a new video file.

- Input: task1.mp4
- Output: another version of the input video "task1.mp4" with rectangles surrounding each traffic sign. A sample output was attached in the assignment ("task1_output_sample.avi").

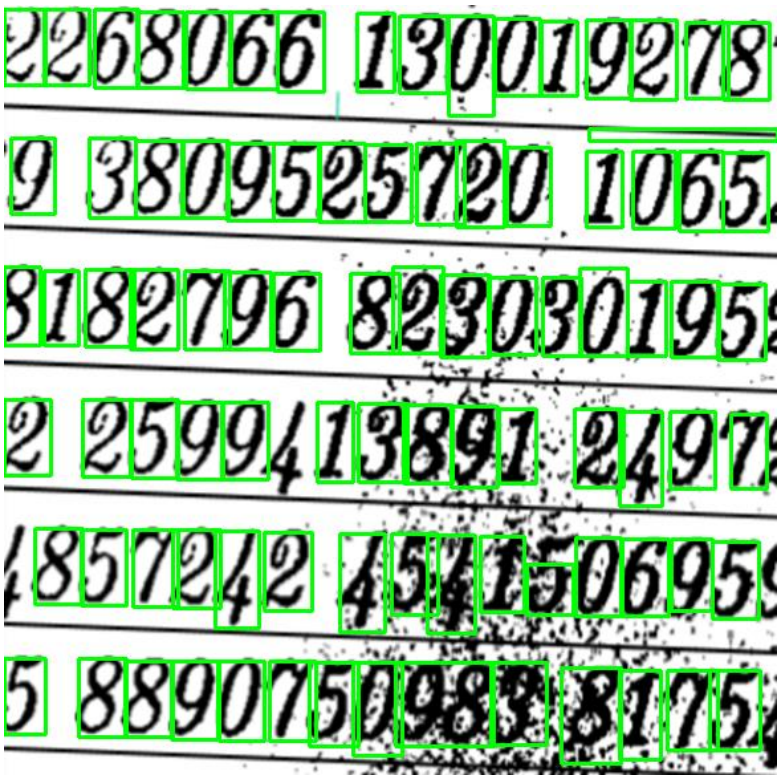
Programing Task 2 (4.0 points): Given an input image as follows:



Filename: **input.png**

Draw rectangles surrounding each digit in the input image automatically, and save the output image into a file.

Here is a sample output:



III. Report part (3.0 points)

1. The report must be submitted in **PDF format**, and the content must be written based on the report/essay format of the Faculty of Information Technology. **In case students do not follow the Faculty's format, they will receive 0 points for the Report part.**
2. The report must include the following contents:
    a. Chapter 1: Methodology of Solving Tasks **(2.5 points)**

    Write a detailed description of the solving methods used in each **task** of the "Programming part" by:

    - Providing a short description of main programming steps in the task
    - Explaining in-detail each programming statement of the source code for the task

    b. Chapter 2: Task results **(0.5 point)**

    Insert all output images of the tasks in the "Programming part" into this section:

- Task 1: three output frames with rectangles surrounding each traffic sign in three different time of the output video (minimum difference of time between two output frames is 8 seconds)
- Task 2: a final output image

The images must be clear, and properly laid out. The images captions and descriptions are also required.

IV. Submission guideline

- Filenames of the source code and the report files must be the **Student IDs**, for ex.,
  - A group of only one student with student ID 521H1495 will submit a Python source file named **521H1495.py** and a report file named **521H1495.pdf**
  - A group of two students with student IDs 521H1234 and 522H4321 will submit a Python source file named **521H1234_522H4321.py** and a report file named **521H1234_522H4321.pdf**
- Filename of the output video (Task 1) must be the **Student IDs**, and **insert Student IDs** into all frames of the output video.
- Students submit **Python source files, an output video, and a report file** to the "**MidTerm_Essay**" assignment on Elearning website of the practical class.
- Students must ensure that the Python source files are not corrupted during execution. The source code with errors will not be scored.
- Python source files must be saved in the correct format (**file extension is .py**). The source files in the wrong format will not be scored.

V. Regulations

- The result of this essay will be the Midterm score.
- **Student who copy their friends's essay will be scored 0.**
- **If a student's work shows signs of copying each other, the student will attend an interview with the lecturer.**

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