Image Processing Task: Manual Extraction of Sellipi Characters

*****Work in pairs*****

Objective: Develop an image processing program to programmatically extract characters from Sellipi inscriptions found in Sri Lanka.

Materials:

1. Computer with image processing software (Python with OpenCV, MATLAB, or other preferred tool).
2. High-definition images of Sellipi inscriptions (downloaded from the internet or taken from a nearby site).

Task Steps:

1. Image Acquisition:

- Collect high-definition images of Sellipi inscriptions.
- Ensure good lighting and minimal distortion.
- If taking photographs, capture images from different angles and distances.

2. Pre-processing:

- Implement techniques (resizing, denoising, histogram equalization) to enhance image clarity.
- Optionally, address perspective distortion or varying lighting conditions.

3. Text Segmentation:

- Apply segmentation techniques to isolate Sellipi text from the background.
- Experiment with thresholding, edge detection, or region-based segmentation.

4. Manual Character Extraction:

- Develop a extraction method to identify and isolate individual characters within the segmented regions.
- Consider interactive tools or algorithms that allow users to manually select and extract characters.

5. Character Enhancement:

- Focus on techniques to enhance the visibility of manually extracted characters.
- Experiment with contrast adjustment, morphology operations, or adaptive filtering.

7. Report:

- Create a report to demonstrate your work (Maximum 10 Pages). Despite working collaboratively, **each team member is required to submit an individual report**.
- Document methodology, challenges faced, and insights gained.
- Include visuals of original Sellipi images, segmented regions, extracted characters, and enhanced characters.
- Include sample code snippets, parameters used, and adjustments made for better results.
- Include personal opinions, challenges faced, and unique insights gained during the process. Emphasize any specific contributions or variations in approach from your partner.

Assessment Criteria:

- Clarity of presentation.
- Effectiveness of image processing techniques.
- Quality of character extraction.
- Creativity in addressing challenges.
- Quality of the written report.