

# Project Report

**Group Members:**

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## Project Topics: Text Recognition

**1. What you were trying to accomplish:**

- Have the program to recognize the shape of alphabetical character and numerical number whenever users pressed key during the process
- Once the machine learning is done, use the knowledge to find the hidden character of the test image and output the result string back to the console.

## 2. What you did accomplish

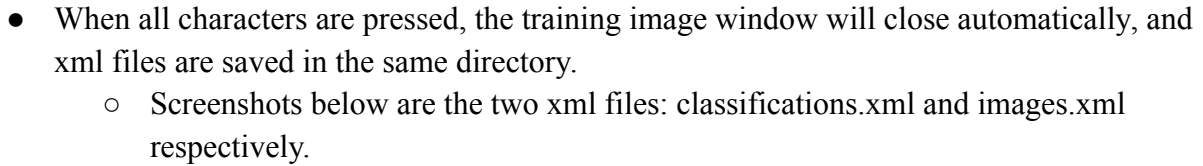
- We have accomplish the training and testing phase of the project successful
- However, regarding additional features to be added further on the project, we did not have enough time to make that happen.

**3. What the results are, include example result images and/or graphs and tables**

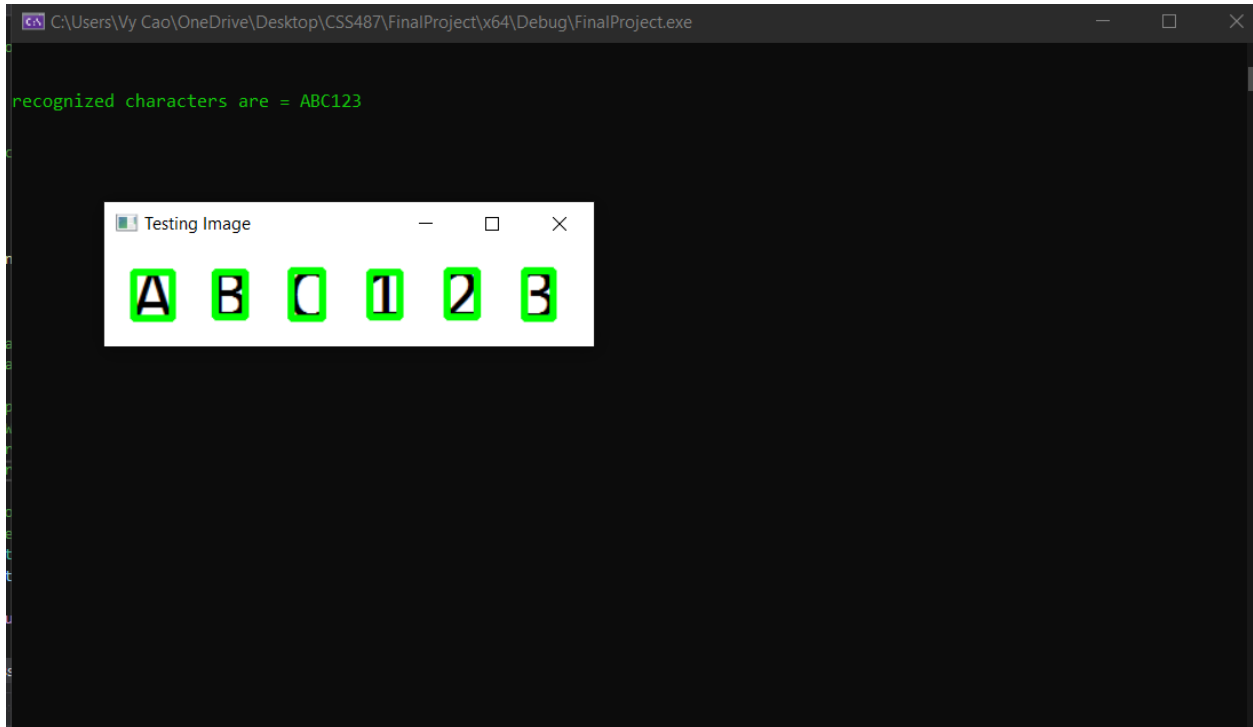
- Training process:
  - Extract each character in the training image and assign it to ASCII value with the help of user inputting and save them in storage file extensions (the classifications.xml and images.xml).

[illegible]

- ROI image and resize image extracted from the training image: the character on these two windows is what the user presses in order for the program to learn the shape of the character.



- Training process:
  - The program will read in the xml files from the previous phase and apply the K nearest neighbor algorithm on them to determine its shape (whether it's close to one of the shapes learnt from previous training phase or not?), when the shape is similar enough, save them to the result string of the class, then print it out in the console to be viewed by the user. Below is the result image example from one of the test cases:
  - Testing process - Result:



With test1.png image, the program was able to identify and match the ASCII value from the classifications.xml files with each of the characters in the test image. The output was shown on the console window and it matches with what we expected.

#### 4. Lessons learned

- We have learned to work as a group to put this big project together in a short period of time, more than two weeks.
- We have learned some other new functions from openCV alongside the ones that we have already learned in class. For instance, the familiars are ColorCVT, Gaussian Blur; and the new ones are adaptive threshold, findContours, rectangle. These functions are very crucial for this project; hence, in order to use them, we had to do lots of research on their purpose as well as their usage, important parameters.
- We also tried to keep practicing on the generic coding requirements of professor Clark Olson. For instance, create a complete OOP project with different classes and different functions for different purposes; detailed commenting for functions as well as some code lines; debug and fix any warnings that appear after we have done with the coding.