Image Processing Project Report

Team#10

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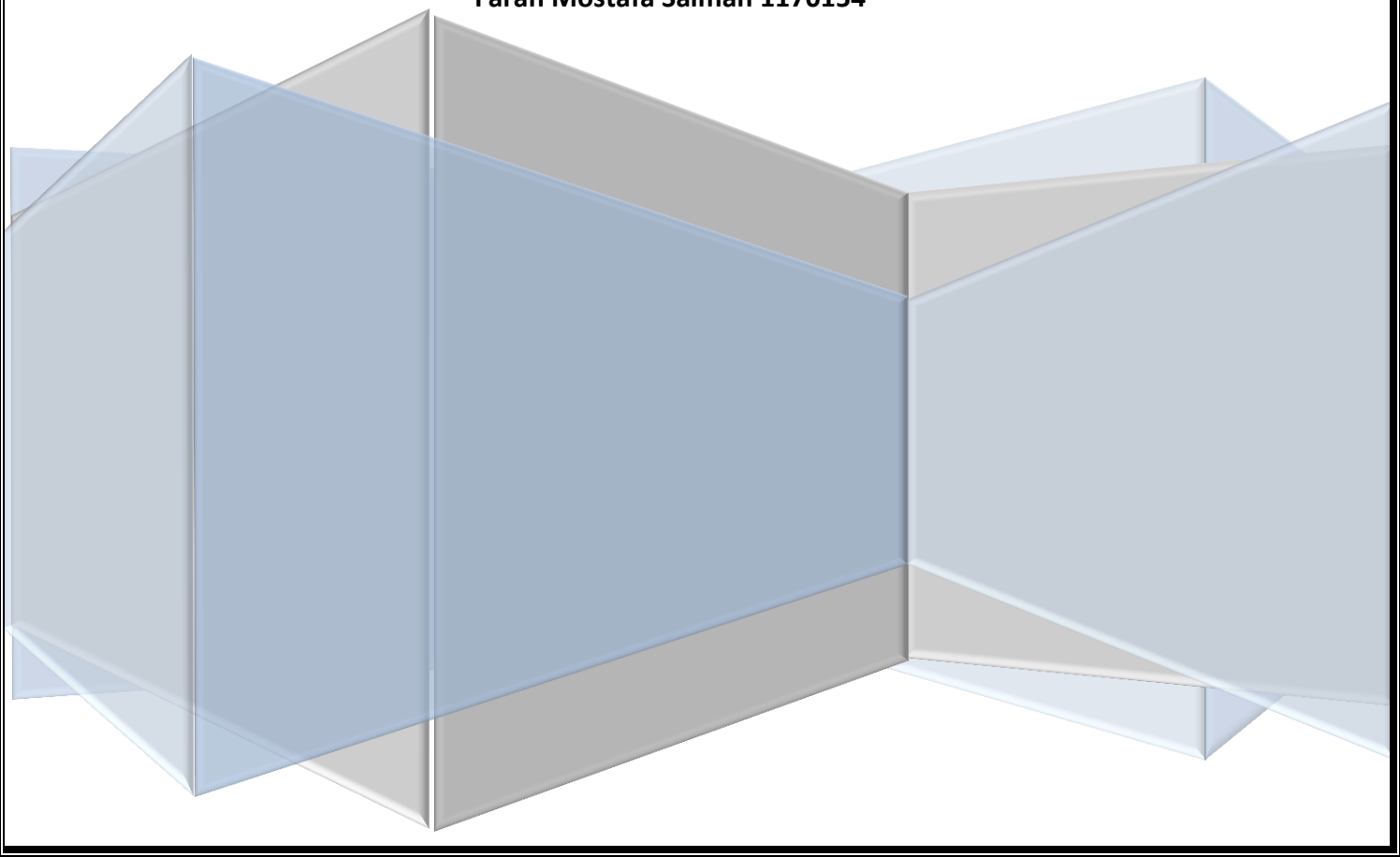


Table of Content:

1) Methodology:

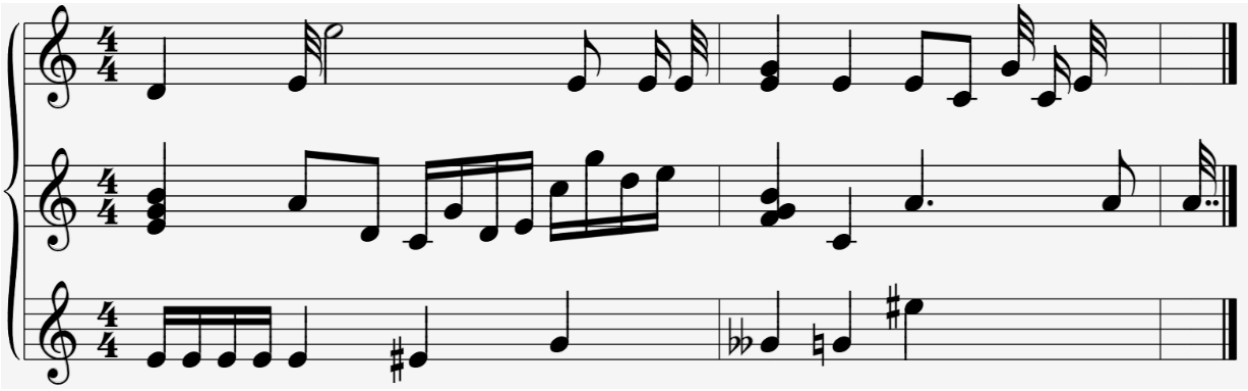
Noise removal-> Binarization-> skewing and orientation-> cropping-> staff segmentation->note position detection->removing lines of the staffs->notes segmentation-> extracting features of each note->predicting shape of the note by classifier->Translating the type and the position of each note to represent it to the corresponding value string-> Output the result string in text file

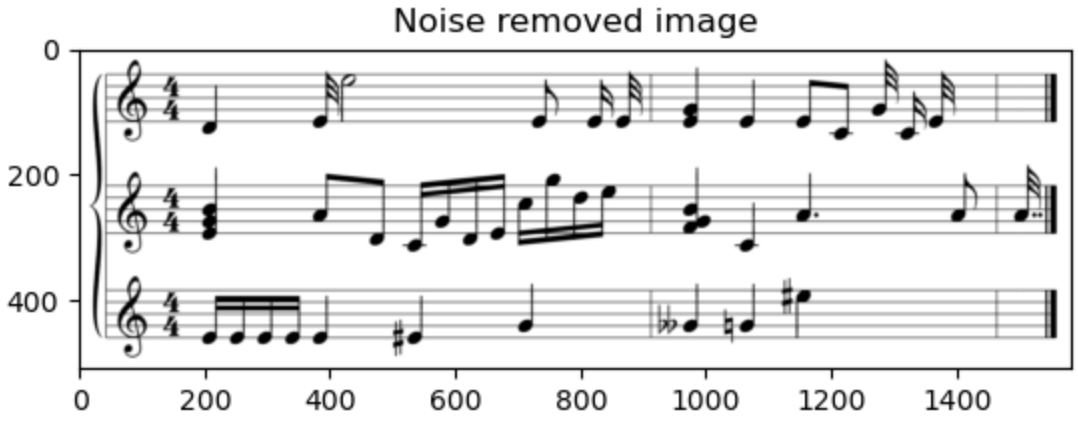
2) Used algorithms:

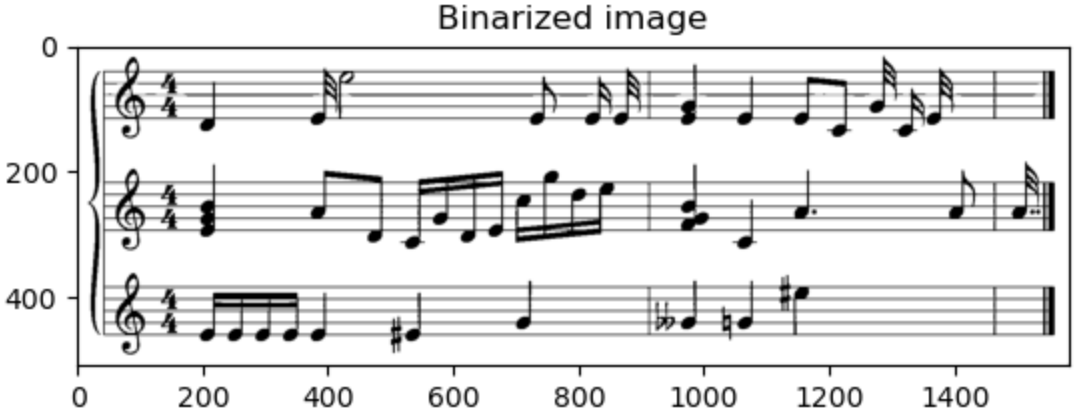
- ✓ Median filter
- ✓ Gaussian filter
- ✓ Global basic thresholding
- ✓ Canny edge detection
- ✓ Hough transform
- ✓ Dilation
- ✓ Borders extraction
- ✓ Segmentation using horizontal histogram analysis
- ✓ Pattern recognition using Match templates
- ✓ Opening
- ✓ closing

3) Experiment results and analysis sample: ”On 02.png”

“Original image”




Noise removed image
0
200
400
0
200
400
600
800
1000
1200
1400


Binarized image
0
200
400
0
200
400
600
800
1000
1200
1400

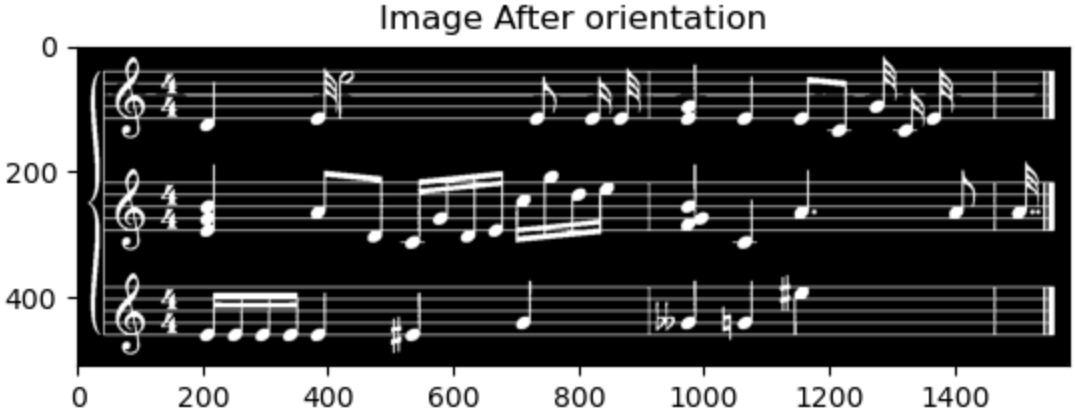
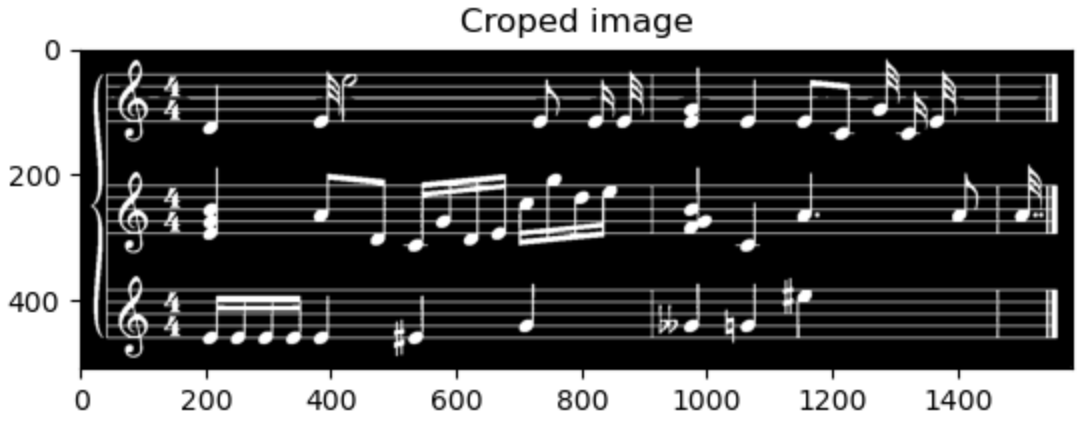
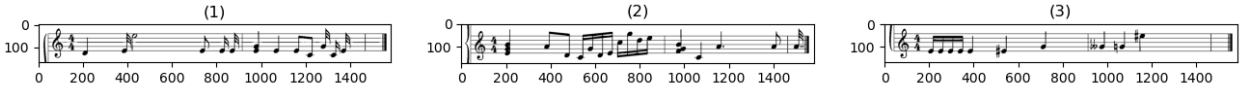


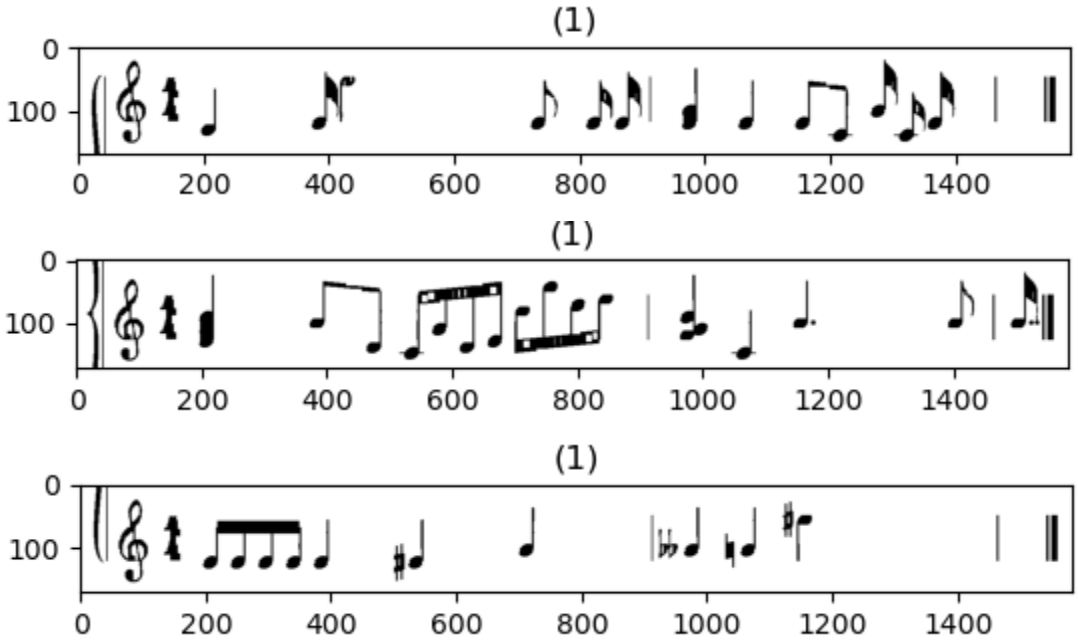
Image After orientation
0
200
400
0
200
400
600
800
1000
1200
1400



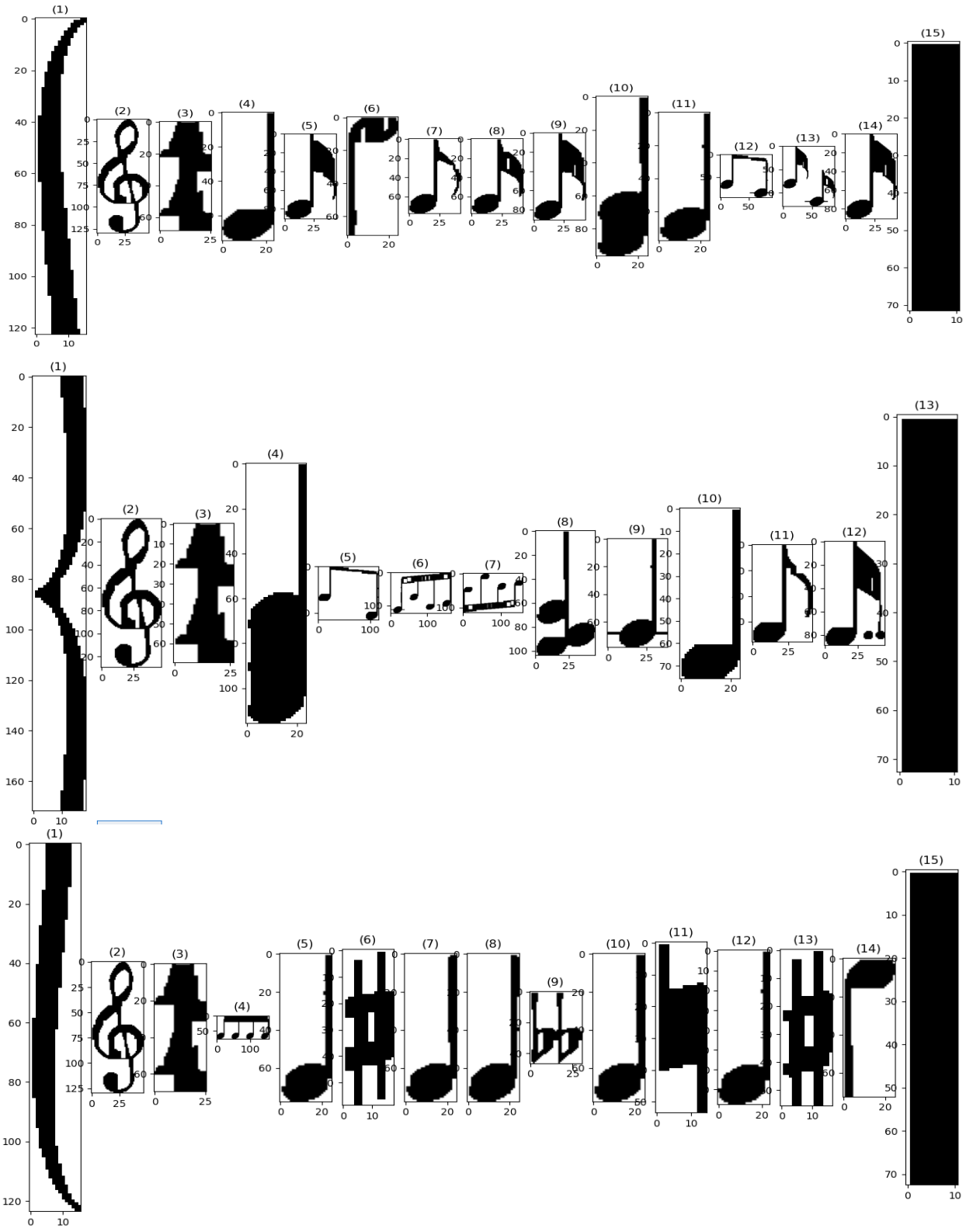
Segmented staffs:



Line removal:



Notes segmentation:



Analysis accuracy output: 5% ☹

4) Work division between team members

Aya Sameh Mohamed	Mariam Mohamed Osama	Nancy Hassan	Farah Mostafa Salman
1) staff segmentation 2) notes segmentation	**1) Noise removal 2) Binarization 3) docker**	**1) note position detection 2) removing lines of the staffs**	**1) skewing and orientation 2) cropping**

All participated in :

1) Extracting features of each note
2) Predicting shape of the note by classifier
3) Translating the type and the position of each note to represent it to the corresponding value string
4) Output the result string in text file

5) Accuracy, performance

Scanned:

- Max Accuracy:82%
- Min Accuracy: 5%

Camera:

- Max Accuracy:43%
- Min Accuracy: 5%

-Takes 8 mins to run the main

6) Conclusion:

Our project helps us to practice most of the image processing techniques and algorithms. Dealing with multiple test cases enforce us to generalize our code as well as practicing how to handle most of the cases and see the performance of each algorithm and choosing the best algorithm to fit in our methodology.