

# Sheet Music Reader

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Team Four Avengers

Mentor: Meher Shashwat Nigam

Team:

Rajashekar Reddy(2018122010) - ECD  
Deeksha Devendra(2018122007) - ECD  
Anurag Sahu (2018121004) - CSD  
Abhinav Navnit(2018122001) - ECD

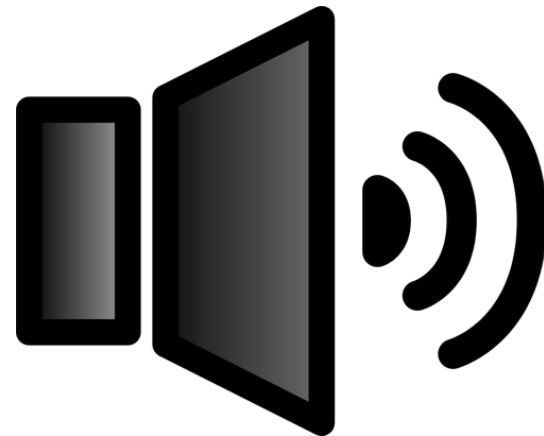
Github Repo:  
<https://github.com/Digital-Image-Processing-IIITH/project-four-avengers>

# Objective

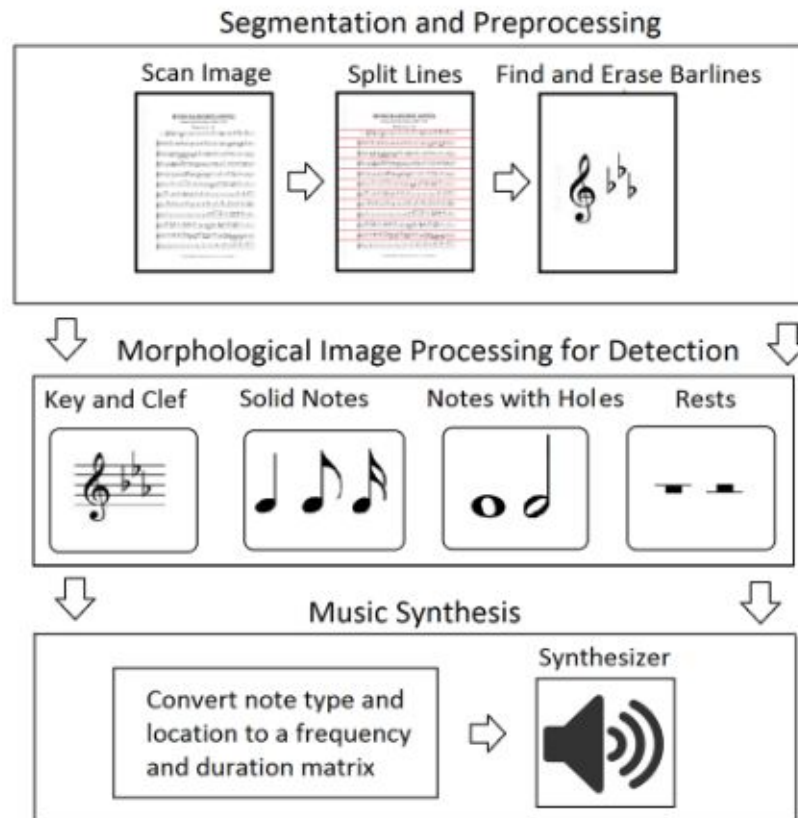
*Mary had a little lamb*



Algorithm Used

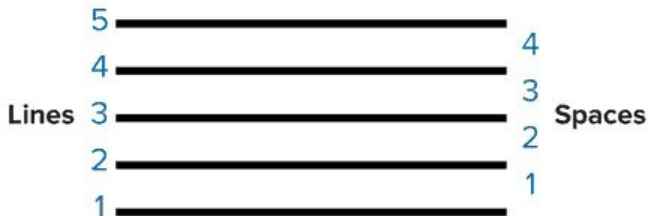


# Methodology

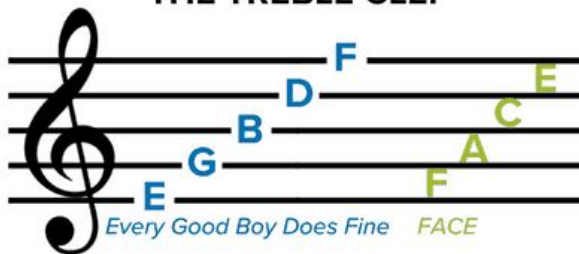


# Music Sheet Basics

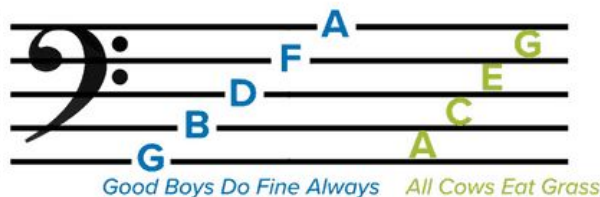
## THE STAFF



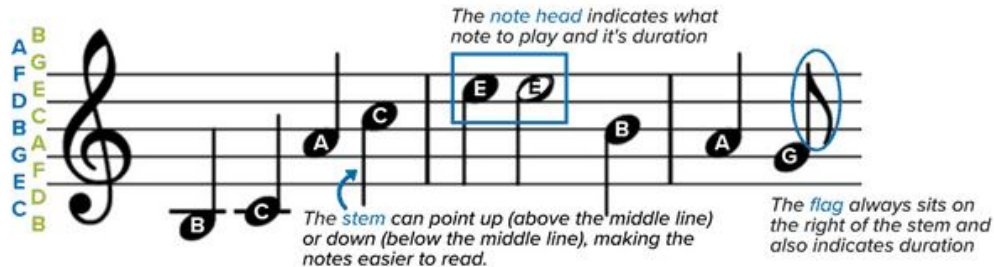
## THE TREBLE CLEF



## THE BASS CLEF



## THE NOTES



## NOTE VALUES

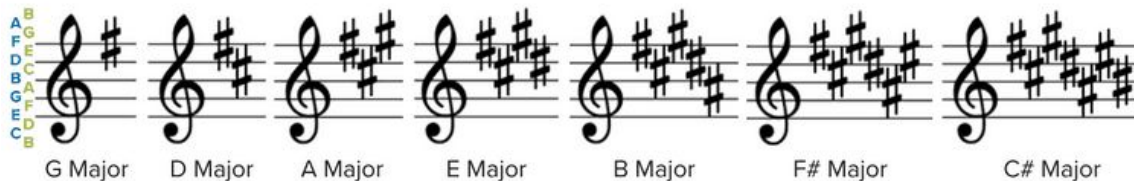


## REST VALUES

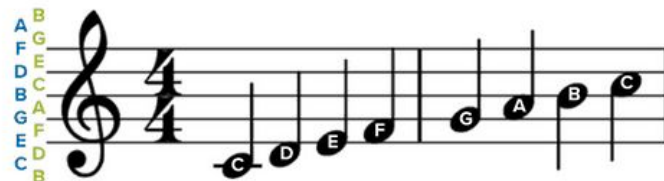


# Music Sheet Basics

## KEY SIGNATURES WITH SHARPS



## THE C SCALE



## KEY SIGNATURES WITH FLATS



## THE C SCALE ON YOUR KEYBOARD



## TEMPO



# Segmentation and Preprocessing

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# Segmentation and Preprocessing

Mary had a little lamb



Original Image



Mary had a little lamb



Binarized using Otsu's Method



Mary had a little lamb



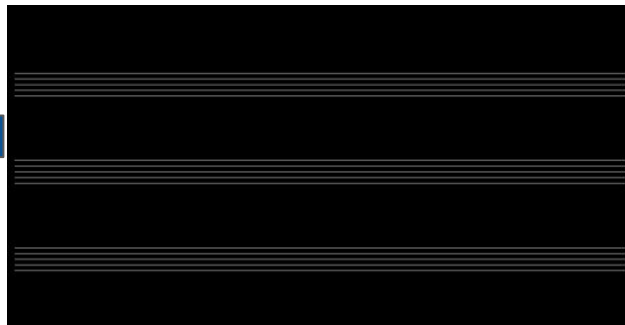
Inverted Image



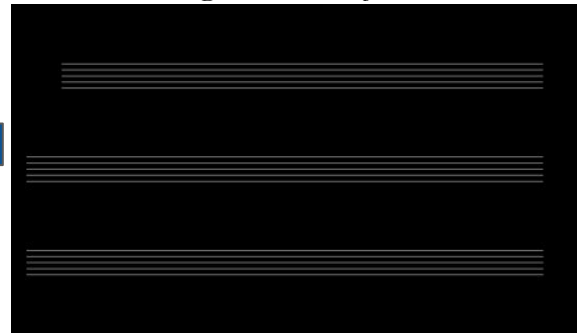
Vertically Eroded



Horizontal Projection Image



Eroded image with only staff lines



# Segmentation and Preprocessing



Use Both to obtain Image Segments  
and Staff lines positions

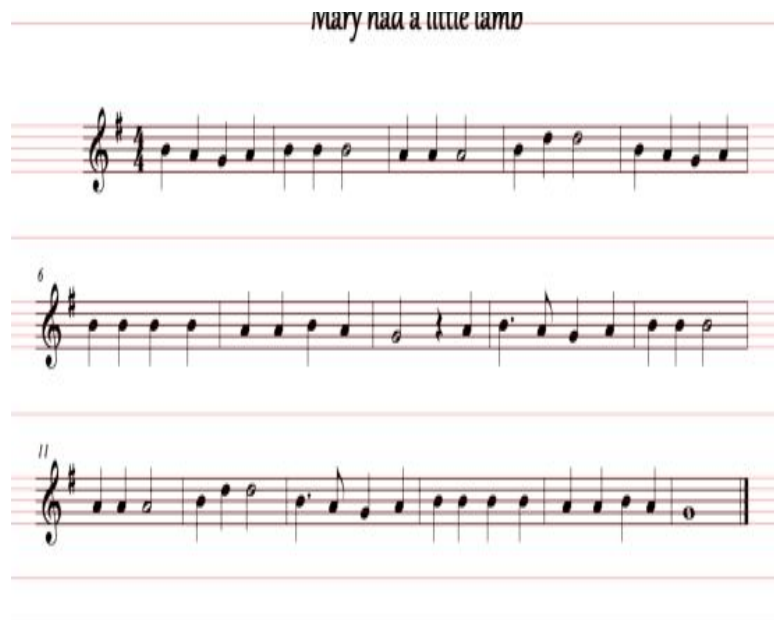
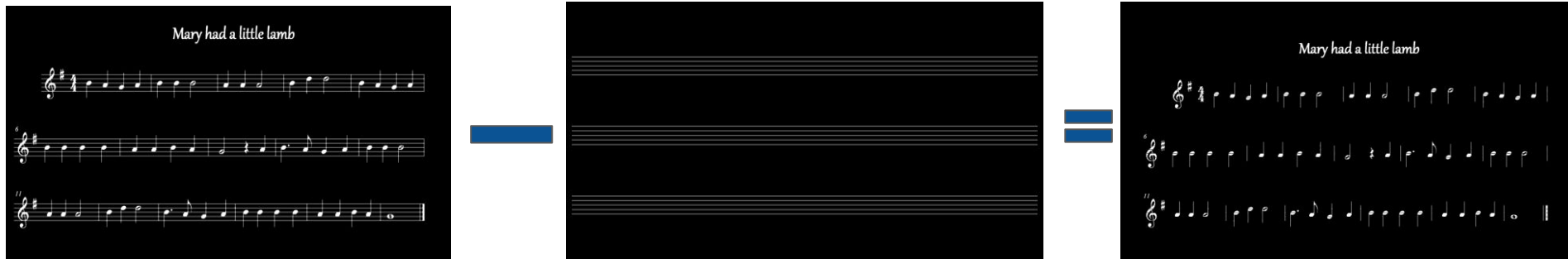


Image Segments and staff line positions are used  
by audio synthesizer later



# Segmentation and Preprocessing



**Next block:  
Object detection**



# Object Detection

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# Rest Detection



Opening by Vertical line

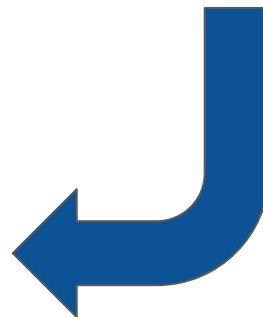
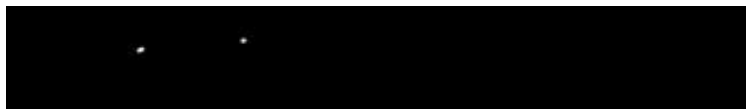
Opening by Horizontal line

Pixels whose variance in  
vertical direction is maximum

# Whole Note and Half Note Detection

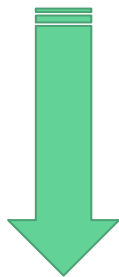


Closing



Opening and Dilate

# Quarter Note and Eighth Note Detection



## Opening by disk



# Final Image



# Music Synthesis

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# PySynth

- Additive synthesis based music synthesis
- As the goal is able to detect notes so we have scripts that can turn ABC notation or MIDI files into a WAV file without too much tinkering.



# Division of Work

- Rajashekar Reddy(2018122010) - Image Segmentation, Staff lines detection, Preprocessing, Half note Detection, Quarter note Detection, Presentation slides,documentation,
- Deeksha Devendra (2018122007)- Treble Clef Detection, Bass Clef Detection
- Abhinav Navnit( 2018122001)- Rest Detection
- Anurag Sahu (2018121004) - Music Synthesis, Notes and Frequency mapping