
**Group-1 Members:**

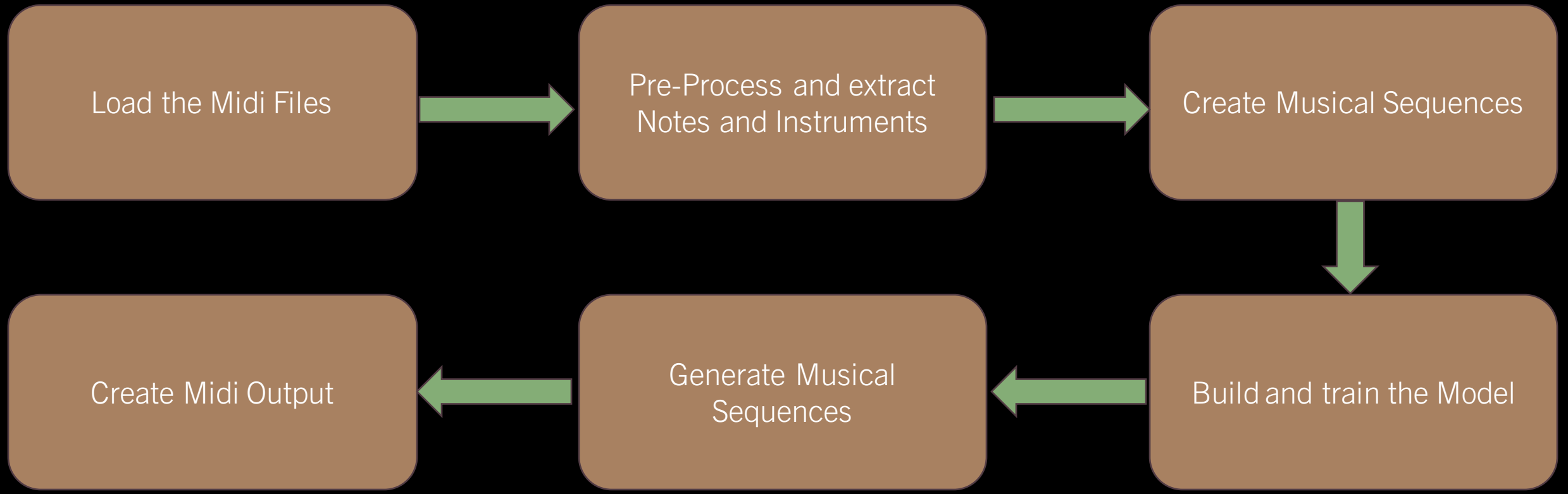
1. Sairam Venkatachalam
2. Devarsh Sheth
3. Disha Kacha

**Guided By:** Prof. Amir Jafari

# INTRODUCTION

- The Topic
  - Using Neural Network models to generate classical music
- Motivation:
  - As music enthusiasts, we were interested in exploring the predictability of classical music patterns
  - We wanted to explore the possibility of generating authentic classical compositions indistinguishable to the human ear.
- Data Source:
  - The dataset consists of classical music compositions in the MIDI format.

# PROJECT FLOW



# DATA PRE-PROCESSING: NOTE EXTRACTION

Loading Midi Files for a specific Composer

Extracting the instruments and notes detected using pretty midi

Extracting the pitch, velocity, start and end time for each note

# DATA PRE-PROCESSING: SEQUENCE GENERATION


Define a Sequence Length (30)

Create Input Sequences of 30 continuous notes

Create Target Sequence as the 31st note

Convert the Target Sequence to a 1 hot encoded vector

# MODEL ARCHITECTURE

Input (1 Dim)

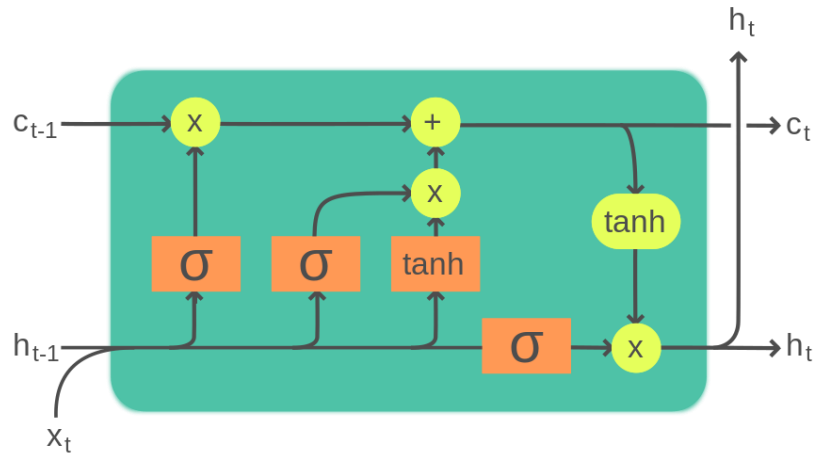
Embedding Layer (100 Dim)

LSTM Layer

LSTM Layer

Softmax Output (128 Dim)

## LONG SHORT-TERM MEMORY CELL



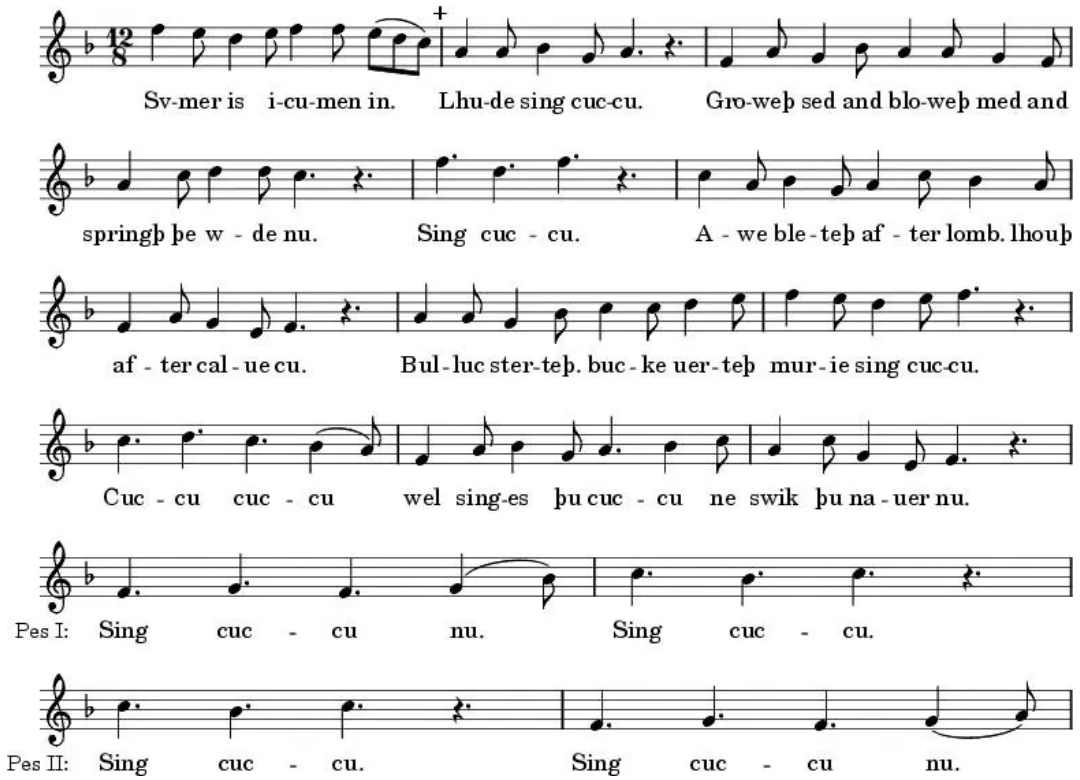

Legend: Layer Componentwise Copy Concatenate

# RESULTS

## ACTUAL

## GENERATED

# Capturing Tempo Changes




- The next note prediction approach works well, however, it lacks in rhythmic depth.
- We attempted to train our model to also capture note durations.

# Conclusion and Future Scope

- **Explore different architectures:** Experiment with different LSTM configurations and additional layers, different models such as VAEs, GANs and many more.
- **Improve data representation:** Use more sophisticated methods to represent musical data, such as encoding musical features.
- **Incorporate attention mechanisms:** Enhance the model's ability to focus on relevant parts of the input sequence.
- **Generate longer sequences:** Extend the model to generate longer musical sequences to capture more complex patterns.

# Thank You