



# Indian Institute of Technology, Kanpur Surge-2022

## "Android Audio Processing"

Under the Guidance of  
**Prof. Vipul Arora,**  
**Associate Professor**  
Department of Electrical Engineering,  
IIT Kanpur (U.P)

Submitted by  
**Saransh Shivhare** (Application No. 2230618),  
Third Year Undergraduate,  
Department of Electrical Engineering,  
IIT Kanpur (U.P)

# OBJECTIVE :

\_\_\_\_\_ This project focuses on reducing the audio latency problems observed in devices with the Android operating system.

\_\_\_\_\_ To explore the available resources for the **low latency audio** and analyze its working mechanism.

\_\_\_\_\_ Implementation of the low latency audio recorder in the Narottam-Music Learning Android application.

# KEY POINTS :

1

Software Used :  
Android Studio, Audacity

3

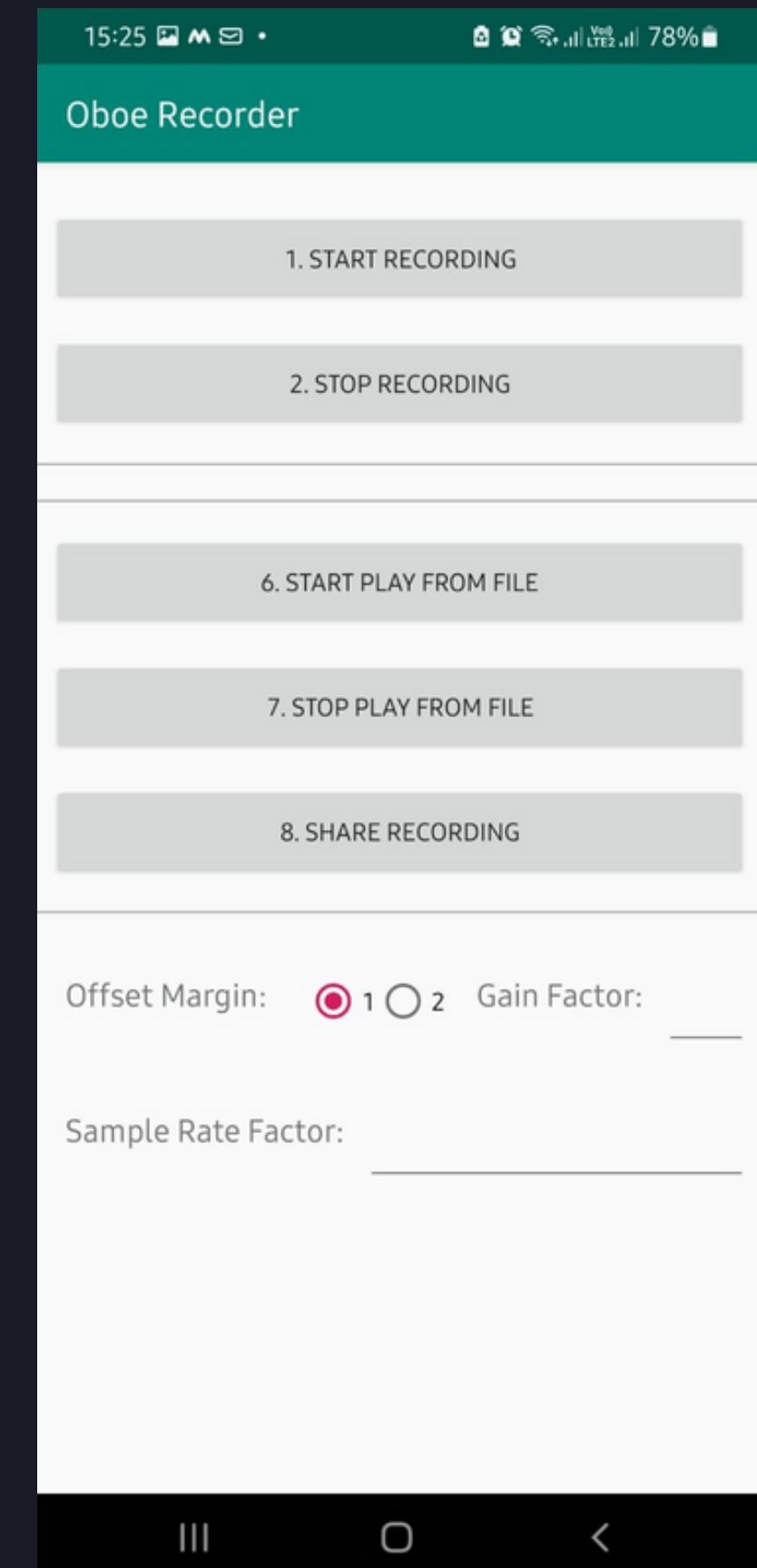
Created a Sample Application to analyze the working mechanism of C++ Oboe library.

2

Programming Language Used:  
Java, C++  
Library Used: Oboe

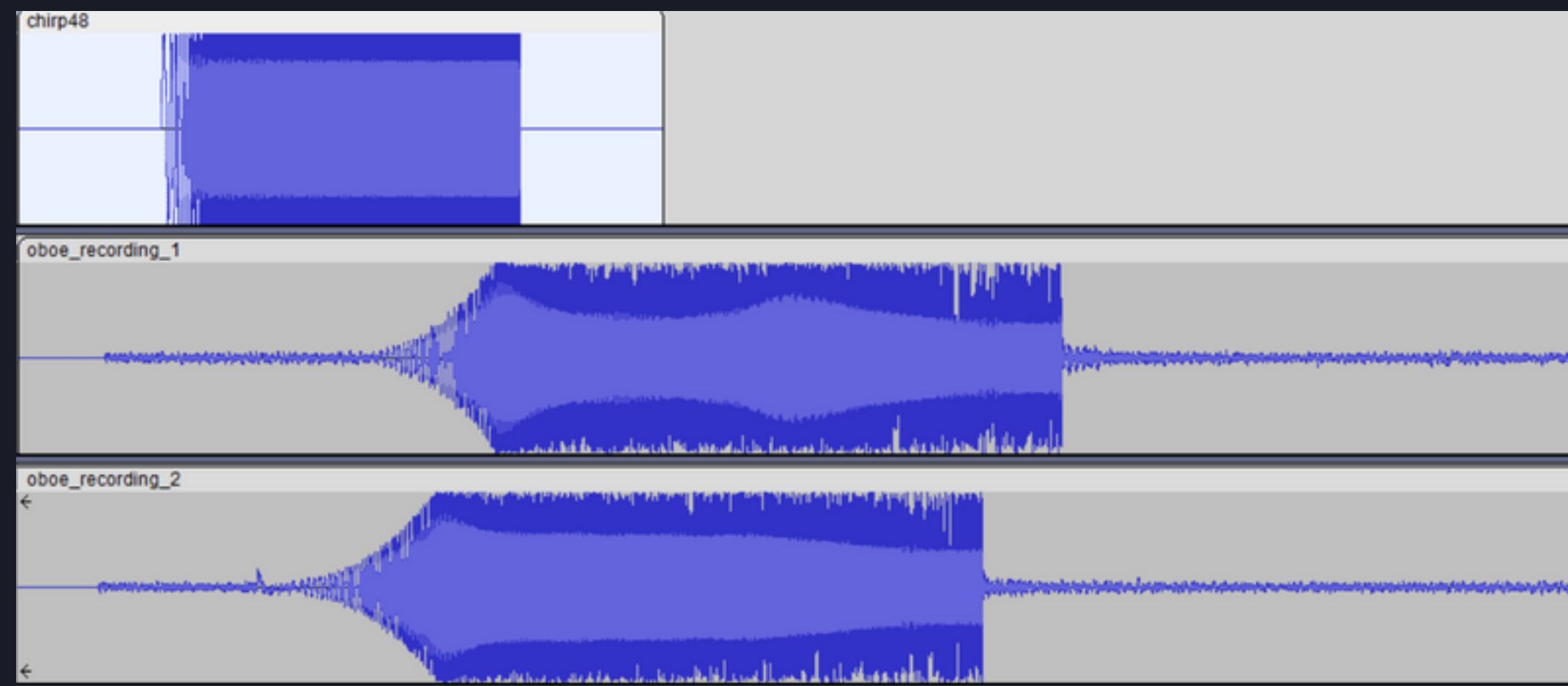
4

Analyzed latency variation by recording multiple audio samples and varying the parameters like sample rate, buffer bursts size, gain margin, etc.



# RESULT :

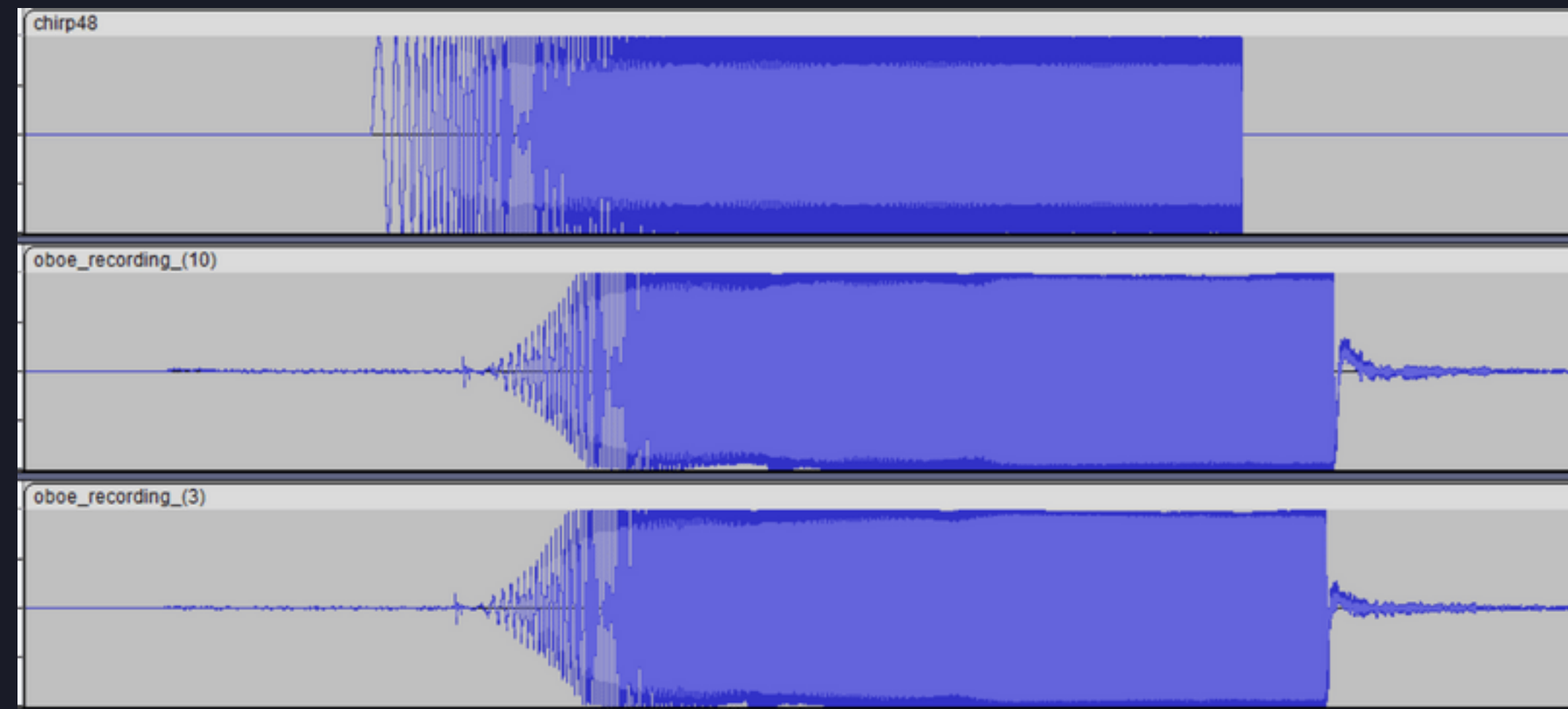
Following are the test audio waveforms and their recordings made after initial implementation of Oboe Library in Android Application:



# RESULT :

Following are the test audio waveforms and their recordings made after introducing modification in the previously implemented code:

```
0.003  
0.011  
0.011  
0.004  
0.0  
0.011  
0.011  
0.003  
0.012  
0.01  
0.005  
0.001  
0.007  
0.008  
0.001  
0.002  
0.003  
0.002  
0.011  
0.009
```



# SUMMARY :

\_\_\_\_\_ Thoroughly analyzed and implemented the C++ Oboe library for high-performance audio on a sample android app

\_\_\_\_\_ Reduced audio latency from a highly unpredictable range to a range of 0ms to 25ms,

\_\_\_\_\_ Implementation of the low latency audio recorder in the Narottam-Music Learning Android application to provide accurate results and better user experience.