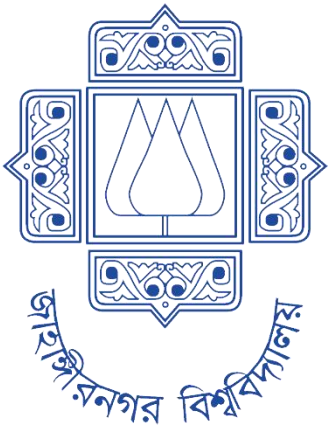
Institute of Information Technology (IIT)

Jahangirnagar University



Lab Report: 09

Submitted by:

Name: Zannat Hossain Tamim

Roll No: 1970

Lab Date: 30-08-2023

Submission Date: 11-09-2023

EXPERIMENT NO : 09

NAME OF THE EXPERIMENT

Audio Data Handling in MATLAB

OBJECTIVE

1.To acquire proficiency in MATLAB for reading various types of audio files (e.g., WAV, MP3) and understanding their data representation.
2.Develop the ability to record and save sound or speech using MATLAB, while understanding the fundamentals of sampling rates and signal quality control.

APPARATUS

1.MATLAB

2.Recorder

THEORY

The process of importing and interpreting audio data from formats like WAV or MP3 in MATLAB is known as audio file reading. It enables data extraction, analysis, and modification. Discrete samples that record sound wave amplitudes at predetermined intervals are used to represent audio data. The basis for signal processing and analysis is provided by built-in MATLAB methods like audioread() that make it easy to import audio data and retrieve metadata like sampling rate and duration. Additionally, MATLAB provides voice recording functionality with methods like audiorecorder(), enabling real-time sound or speech capture and opens the door to applications like voice recognition and audio research.

PROGRAM

Read Audio Files in Matlab.

```
close all; clear all;
load handel.mat
[data,fs] = audioread('tamim.wav');
[x, fs1] = audioread('tamim.wav');

sound(x,fs1);
player = audioplayer(x,fs1);
play(player);
```

```
pause(5);
pause(player);
pause(5);
stop(player);
plot(x); title('Input Sound File');
```

OUTPUT:

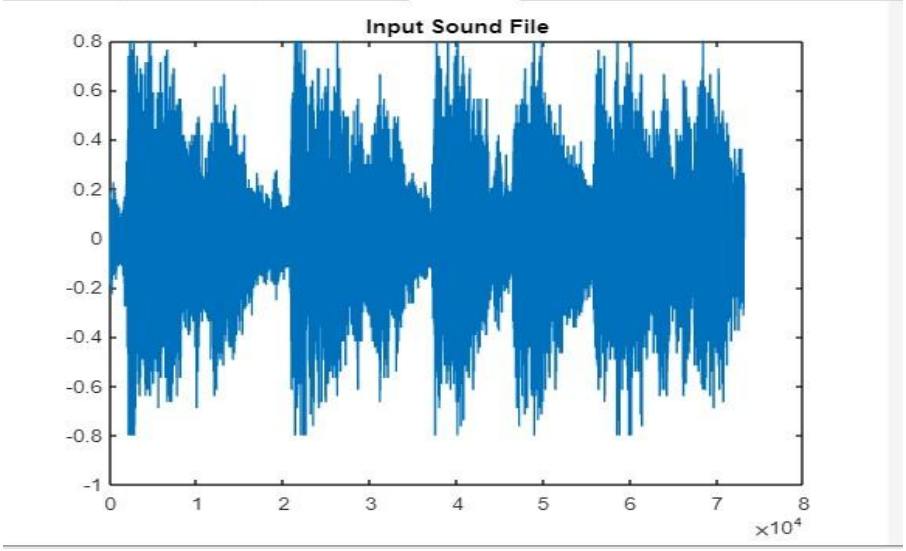


Figure 1: Input sound file signal

Record Speech/Sound in Matlab.

```
close all; clear all;
dev = audiodevinfo;
rec = audiorecorder(44100, 16, 1);
% start recording
disp('start speaking');
% record(rec, 5); % will record for 5sec. for this command pause needs to be added
recordblocking(rec,5);
% stop recording
disp('Stop recording');
% Play recorded sound
play(rec);
y = getaudiodata(rec);
plot(y);
```

OUTPUT:

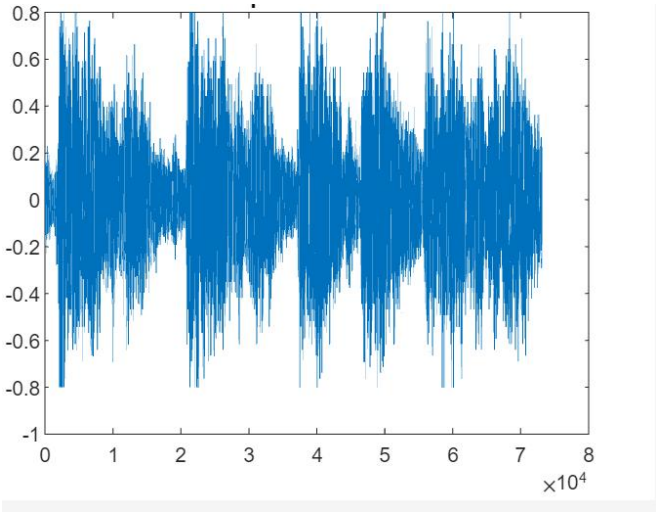


Figure 2: Recorded audio signal

DISCUSSION

In this experiment, tasks like analyzing file properties and visualizing audio waveforms show the growth of a profound understanding of data representation. In addition to investigating voice recording with MATLAB, we also developed our abilities to design input devices and optimize recording conditions. This practical experience has significantly boosted our ability to record and store real-time sound or speech, setting the stage for a number of field applications.

CONCLUSION

The capacity to work with audio data in a range of domains, from sound analysis to speech recognition, is made possible by the ability to handle audio files and record voice in MATLAB. These fundamental techniques allow the application of audio processing and analysis inside the MATLAB environment in ever more sophisticated experiments and projects.

REFERENCE

[1]JAGADISH CHANDRA BOSE RESEARCH ORGANISATION,Available: https://www.jcbrolabs.org/speech-processing[Accessed: September 10, 2023]