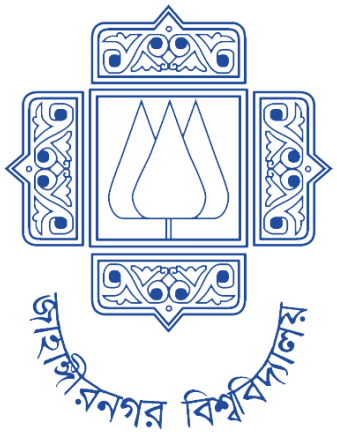
Institute of Information Technology (IIT)

Jahangirnagar University



Lab Report: 09

Submitted by:

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Roll No: 2023

Lab Date: 30-08-2023

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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 understandingthe fundamentals of sampling rates and signal quality control.

APPARATUS

1. MATLAB
2. Recorder

THEORY

In MATLAB, audio file reading is the process of importing and interpreting audio data from formats like WAV or MP3. It allows for data extraction, analysis, and manipulation. Audio data is represented as discrete samples capturing sound wave amplitudes at regular intervals.

MATLAB's built-in functions like audioread() facilitate loading audio data and accessing metadata like sampling rate and duration, serving as a foundation for signal processing and analysis. Additionally, MATLAB offers voice recording capabilities through functions like audiorecorder(), enabling real-time capture of sound or speech, opening doors to applicationslike voice recognition and audio research.

PROGRAM

Read Audio Files in Matlab.

```
clc;
clear;
close all;
% read .wav file
[data,fs] = audioread('shakil.wav');
% read .mp3 file
[x, fs1] = audioread('shakil.mp3');
% play audio files
sound(x,fs1); %one method
% play audio files by another method
player = audioplayer(x,fs1);
play(player);
pause(5);
pause(player);
pause(5);
stop(player);
% plot signal
plot(x);
title('Input Sound File');
```

Record Speech/Sound in Matlab.

```
clc;
clear;
close all;
recObj = audiorecorder;
recDuration = 10; % will record for 10sec. for this command pause
needs to be added
% start recording
disp("Begin speaking.")
recordblocking(recObj,recDuration);
% stop recording
disp("End of recording.")
% Play recorded sound
play(recObj);
% get audio data
y = getaudiodata(recObj);
% plot the sound
plot(y);
```

RESULT

Read Audio Files in Matlab.

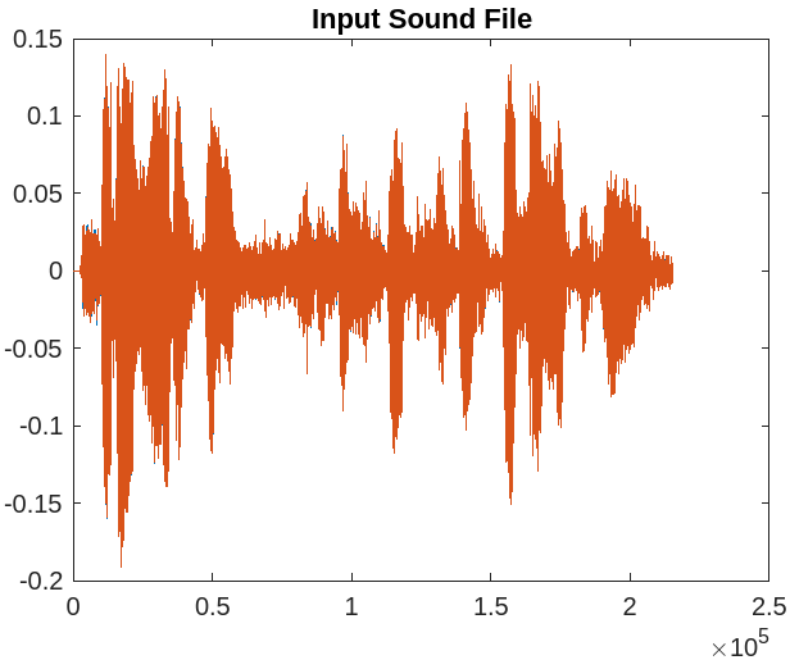

Figure: input sound file signalRecord Speech/Sound in Matlab.

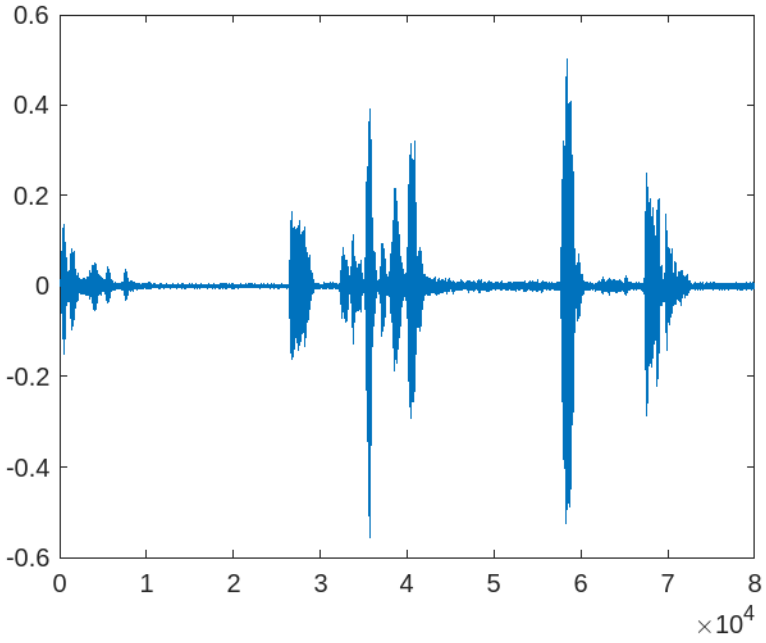

Figure: recorded audio signal

DISCUSSION

This experiment shows the acquisition of a deep understanding of data representation, encompassing tasks such as exploring file properties and visualizing audio waveforms. We also delved into voice recording using MATLAB, where we became adept at configuring input devices and optimizing recording parameters. This practical experience has significantly expanded our capabilities for real-time sound or speech capture and storage, providing a solid foundation for various applications in the field.

CONCLUSION

Mastering audio file handling and voice recording in MATLAB equips us with valuable skills for working with audio data in various domains, from music analysis to speech recognition. These foundational techniques pave the way for more advanced experiments and projects that rely on audio processing and analysis within the MATLAB environment.

REFERENCE

[1] JAGADISH CHANDRA BOSE RESEARCH ORGANISATION,
Available: https://www.jcbrolabs.org/speech-processing [Accessed: September 9, 2023]