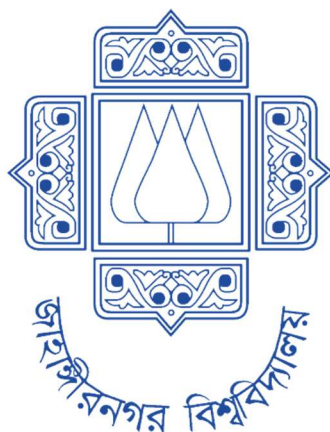# Institute of Information Technology (IIT)

Jahangirnagar University

Lab Report: 09

<u>Submitted by:</u>

Name: Md Shakil Ahmed

Roll No: 2013

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 analyzing audio data from formats like WAV or MP3 in MATLAB is known as audio file reading. Data extraction, analysis, and modification are all possible. Discrete samples that record sound wave amplitudes at regular intervals are used to represent audio data. The basis for signal processing and analysis is provided by built-in MATLAB methods like audio read (), which make it easy to import audio data and access metadata like sampling rate and duration. Additionally, MATLAB offers voice recording capabilities through functions like audiorecorder(), enabling real-time capture of sound or speech, opening doors to applications like voice recognition and audio research.

PROGRAM
Read Audio Files in Matlab.

close all; clear all;

% read .wav file

[data,fs] = audioread('shakil.m4a');

% read .mp3 file

```matlab
[x, fs1] = audioread('shakil.m4a');

% 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.

```matlab
close all; clear all;

dev = audiodevinfo;

rec = audiorecorder(44100, 16, 1);

% start recording

disp('startspeaking');

% 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); disp('jjjjjjjjj')

% get audio data

y = getaudiodata(rec);

% plot the sound

plot(y);
```

RESULT

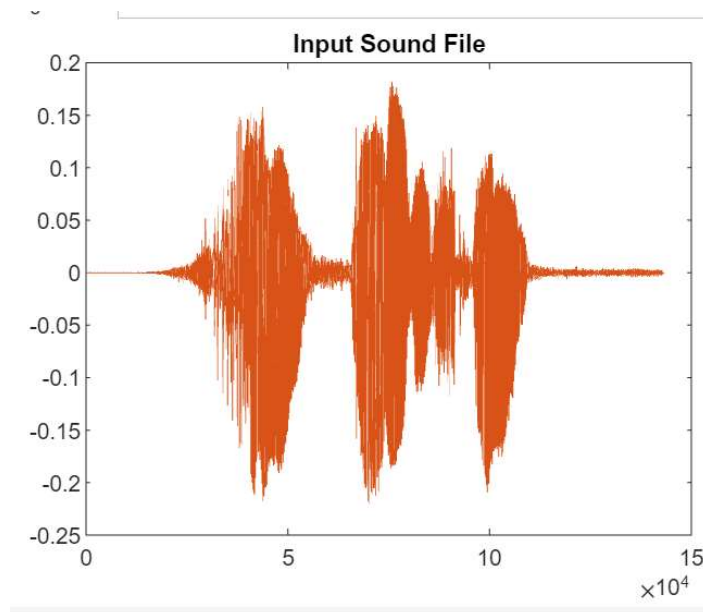## Read Audio Files in Matlab.

Figure: Input sound file signal

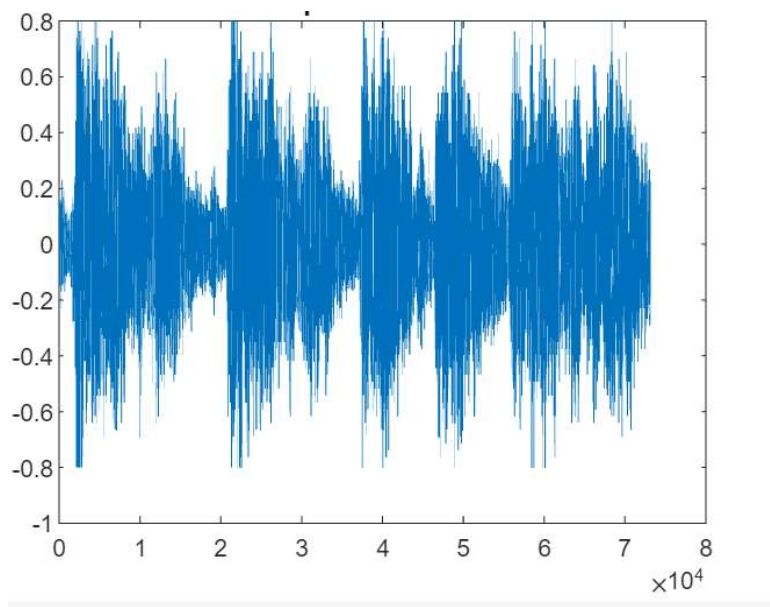## Record Speech/Sound in Matlab.

Figure: Recorded audio signal

DISCUSSION

In this experiment, tasks like investigating file characteristics and visualizing audio waveforms demonstrate the development of a thorough understanding of data representation. Using MATLAB, we also explored voice recording, where we honed our skills at creating input devices and optimizing recording settings. Our capacity for real-time sound or speech capture and storage has been greatly increased by this actual expertise, laying the groundwork for several field applications.

CONCLUSION

The ability to handle audio files and record voice in MATLAB gives us useful skills for working with audio data in a variety of fields, from music analysis to speech recognition. The use of audio processing and analysis within the MATLAB environment in more complex experiments and projects is made possible by these core methods.

REFERENCE

[1] https://www.pcmag.com/how-to/what-is-digital-signal-processing-dsp-and-how-does-it-affect-audio[Access-10 september,2023]