**Bài 1:**

% Step 1: Read the recorded .wav file

filename = 'C:\Users\LENOVO\Documents\Audacity\baitap1oki.wav';

[x, Fs] = audioread(filename);

% Step 2: Plot the signal over time

figure;

subplot(3, 1, 1);

plot(0:(length(x)-1), x);

xlabel('Sample Index');

ylabel('Amplitude');

title('Signal Over Time');

grid on;

% Step 3: Show the length of the signal in samples and seconds

signal\_length\_samples = length(x);

signal\_length\_seconds = signal\_length\_samples / Fs;

fprintf('Signal Length in Samples: %d\n', signal\_length\_samples);

fprintf('Signal Length in Seconds: %.2f\n', signal\_length\_seconds);

% Step 4: Playback the signal at different sampling rates

% Playback at Fs

sound(x, Fs);

pause(signal\_length\_seconds + 1); % Wait for the signal to finish

% Playback at Fs/2

sound(x, Fs/2);

pause(2 \* signal\_length\_seconds + 1); % Wait for the signal to finish

% Playback at Fs\*2

sound(x, Fs\*2);

pause(0.5 \* signal\_length\_seconds + 1); % Wait for the signal to finis

**Bài 2:**

A = 10.0;

%F0 = 1000.0;

phi = pi/4;

n2 = 5;

n1 = 0;

n = n1:0.1:n2;

x\_n1 = A \* cos((2/3) \* pi \* n + phi);

x\_n2 = A \* cos((4/3) \* pi \* n + phi);

figure;

stem(n, x\_n1,'r','DisplayName', 'x1[n] (Fs1)');

hold on;

stem(n, x\_n2,'b','DisplayName', 'x2[n] (Fs2)');

xlabel('Sample Index 👎');

ylabel('Amplitude');

legend;

title('Discrete Signals');

grid on;

hold off;