

Signals and Systems

Programming Assignment

Report

Team members:

1. Mota Ram(B21ME039)
2. Prince Kumar Jain(B21CH025)
3. Mayank Raj(B21ME038)

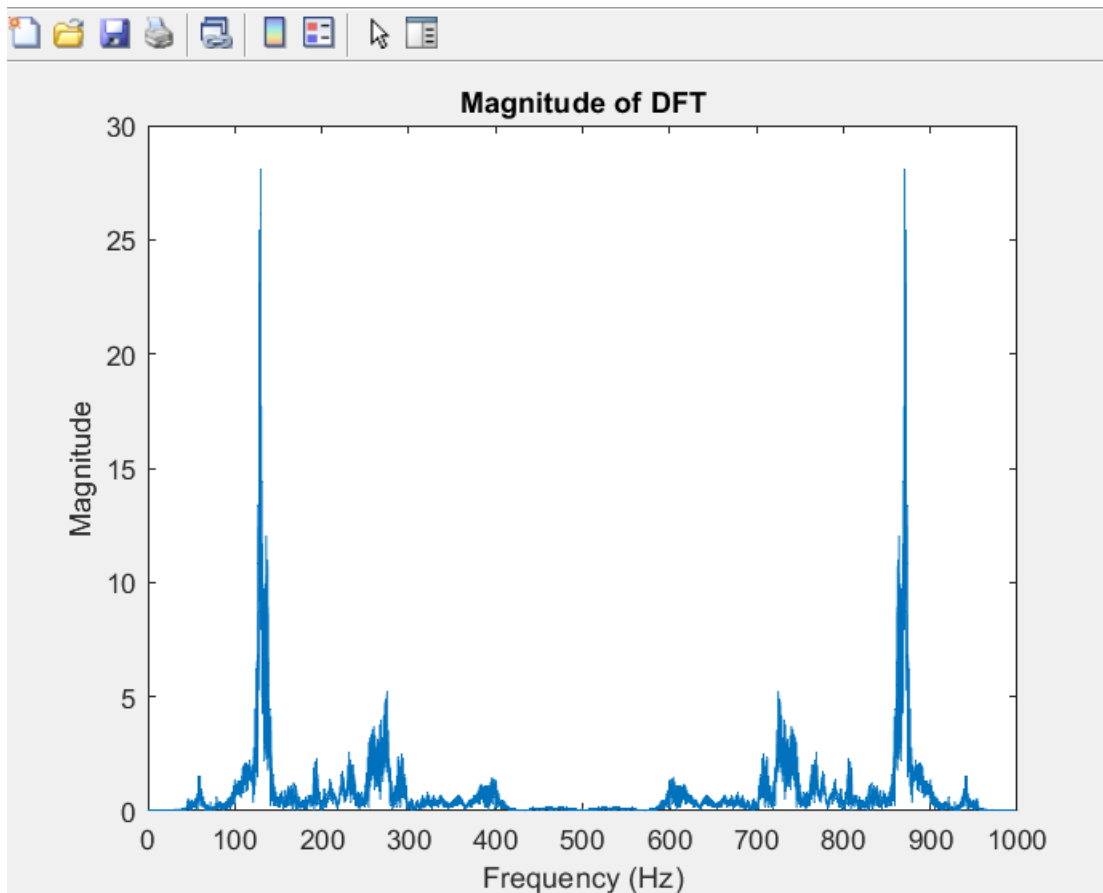
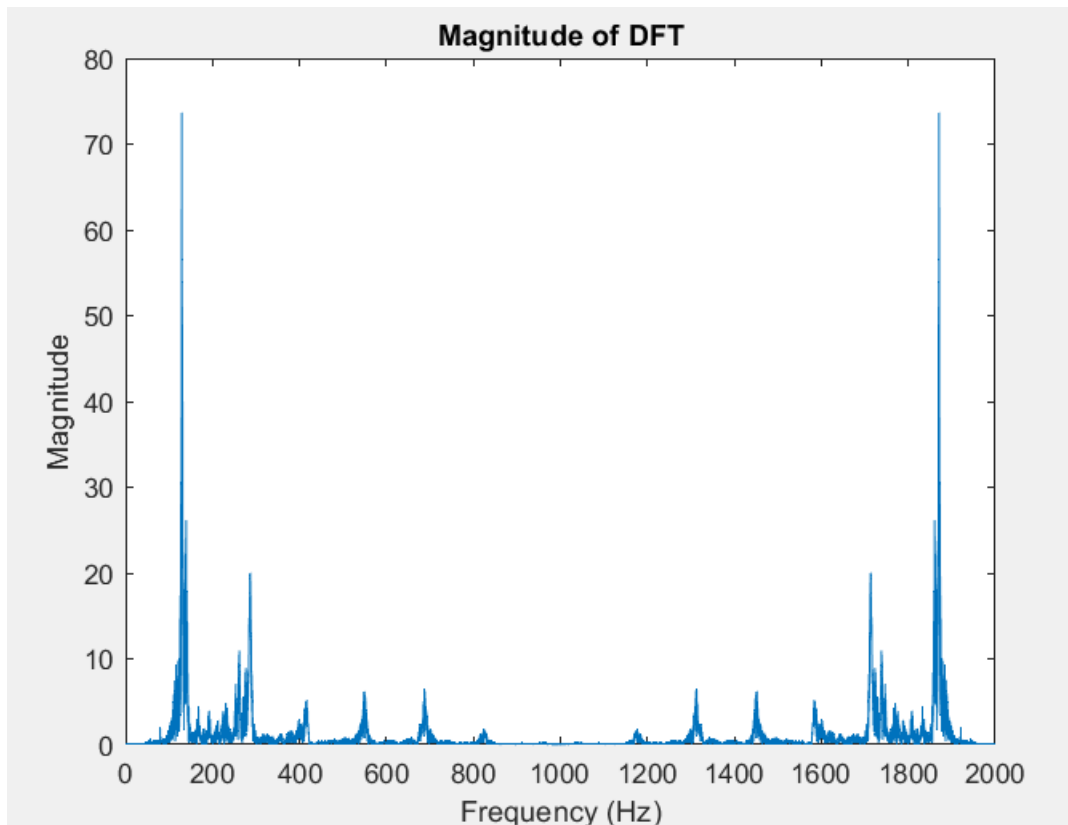
- **Mota Ram:-**

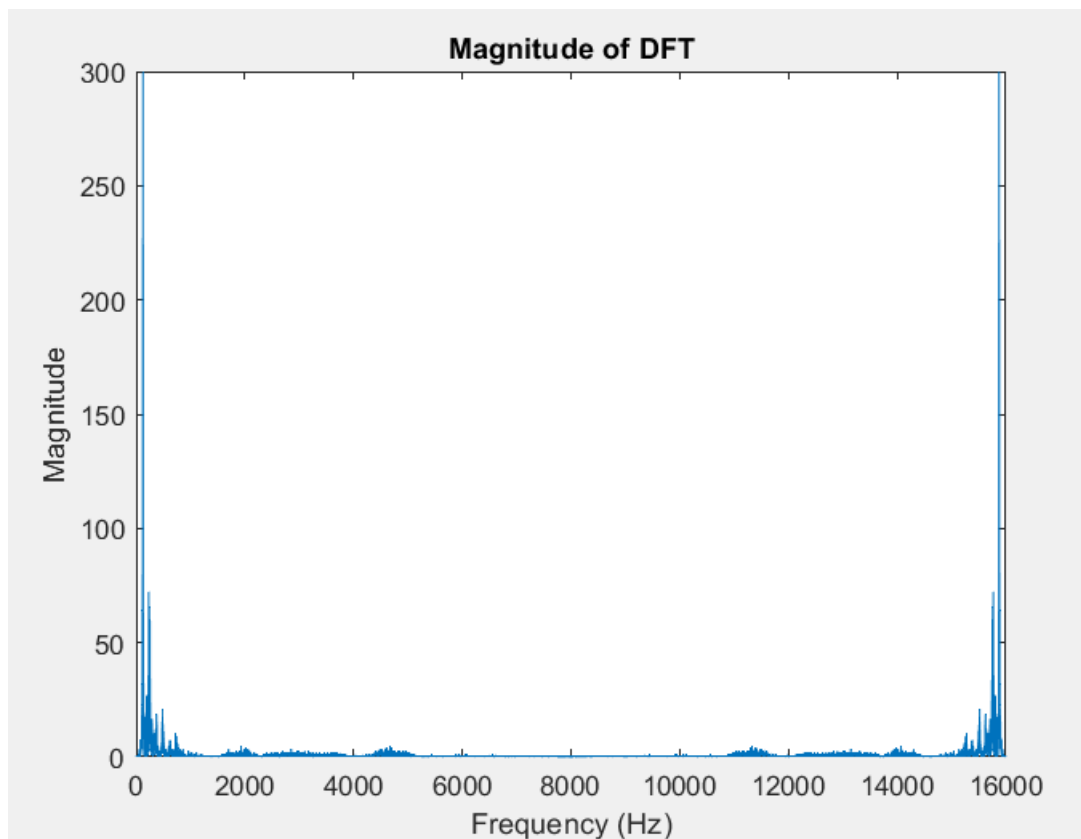
Frequencies present in audio signals:-

	1000(Hz)	2000(Hz)	16000(Hz)
Sentence: 1	129.6	129.2	125.4
Sentence: 2	129.2	137.4	127.2
Sentence: 3	129.62	128.12	128.38
Sentence: 4	128.2	127.9	122.0

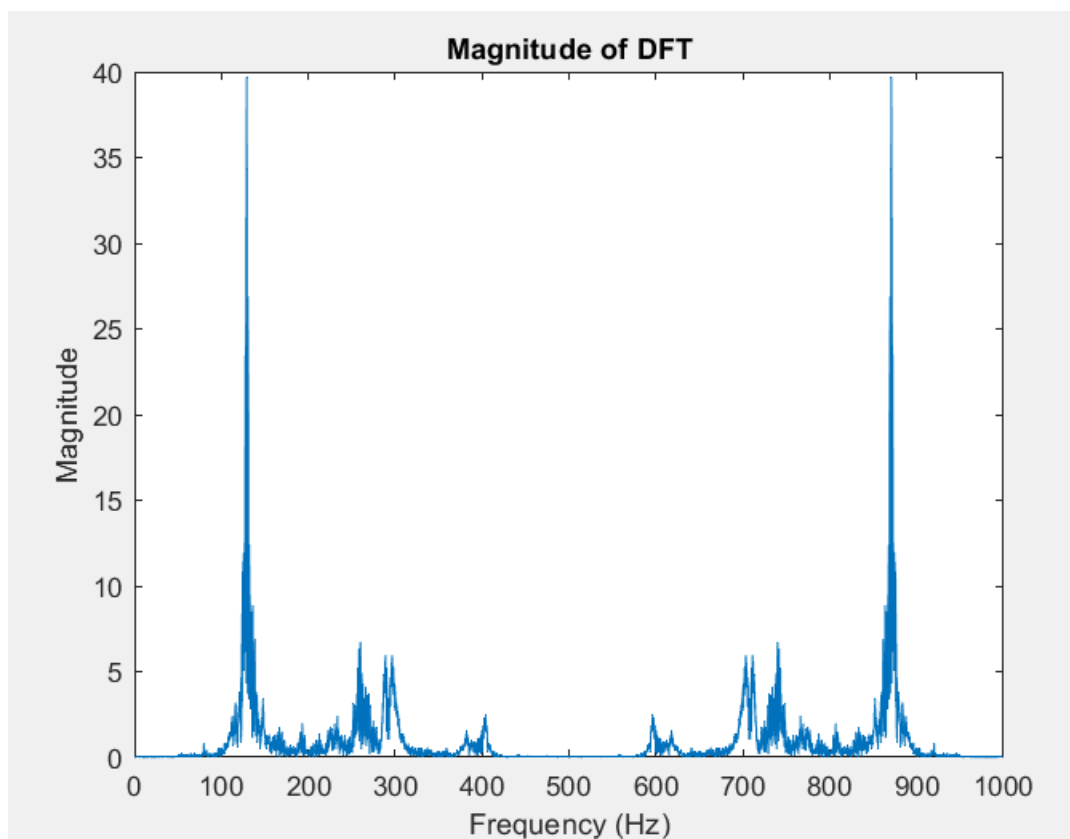
Graph between frequency and magnitude of Discrete Fourier Transform :-

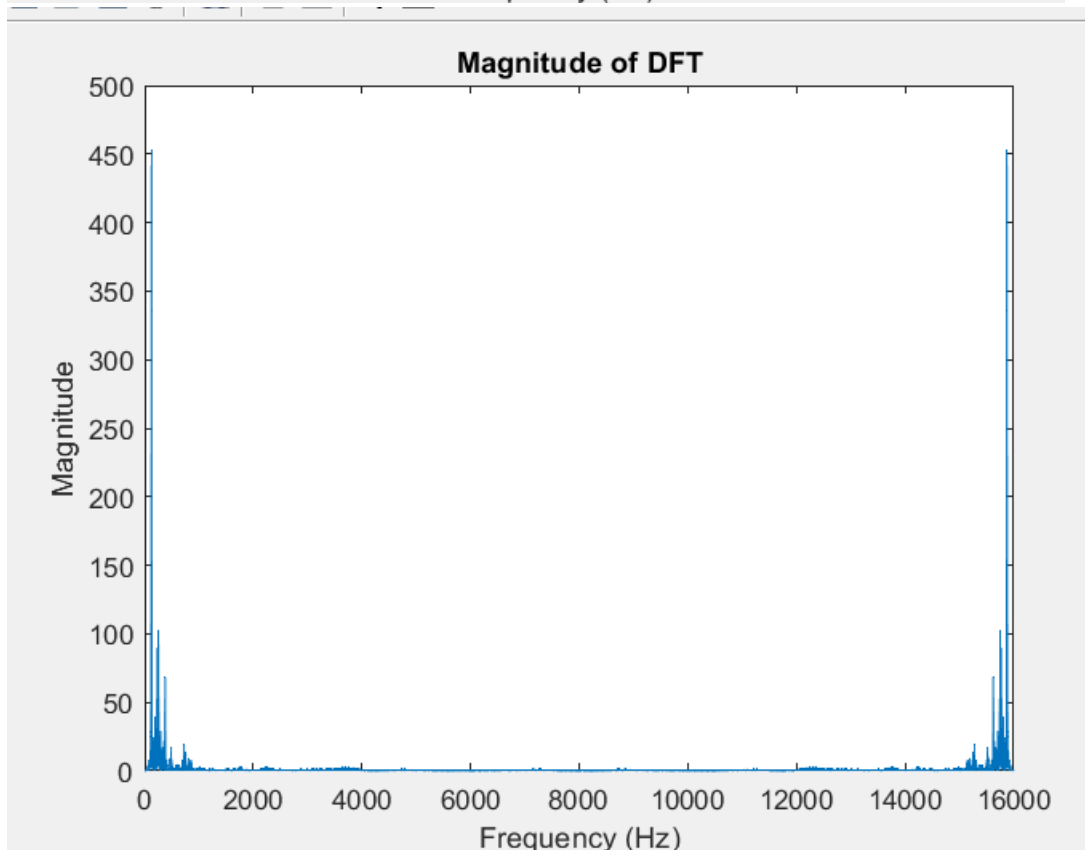
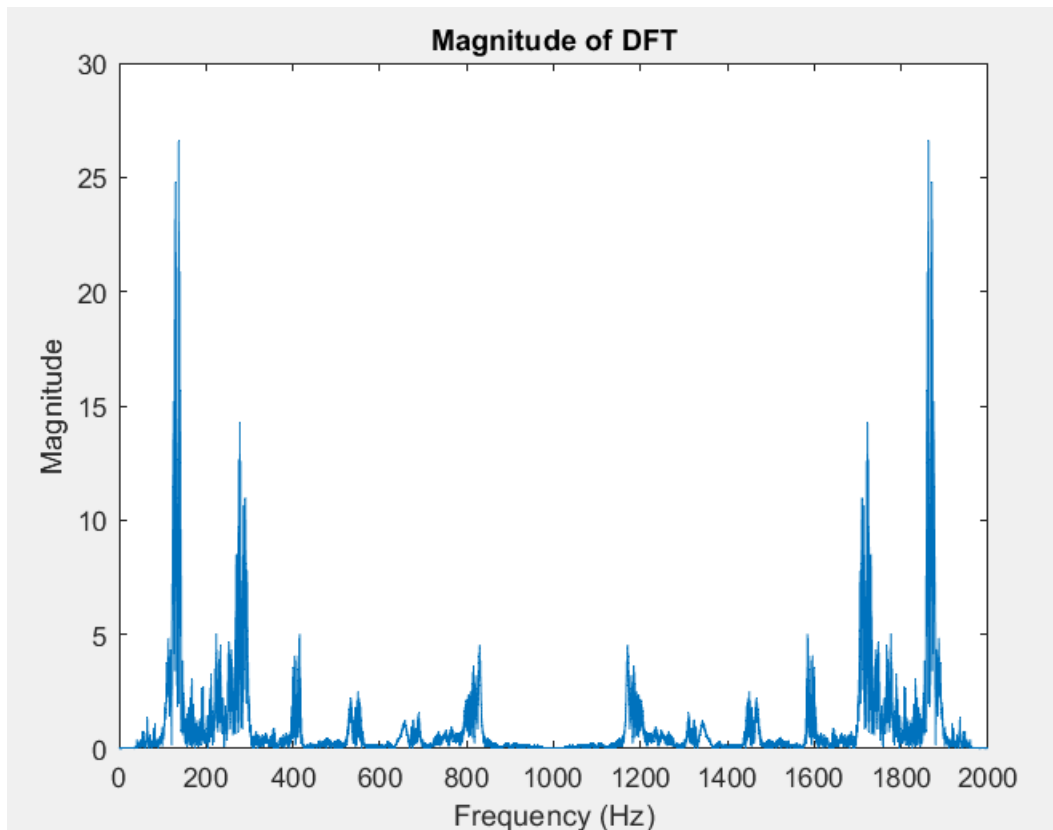
Sentence:- 1



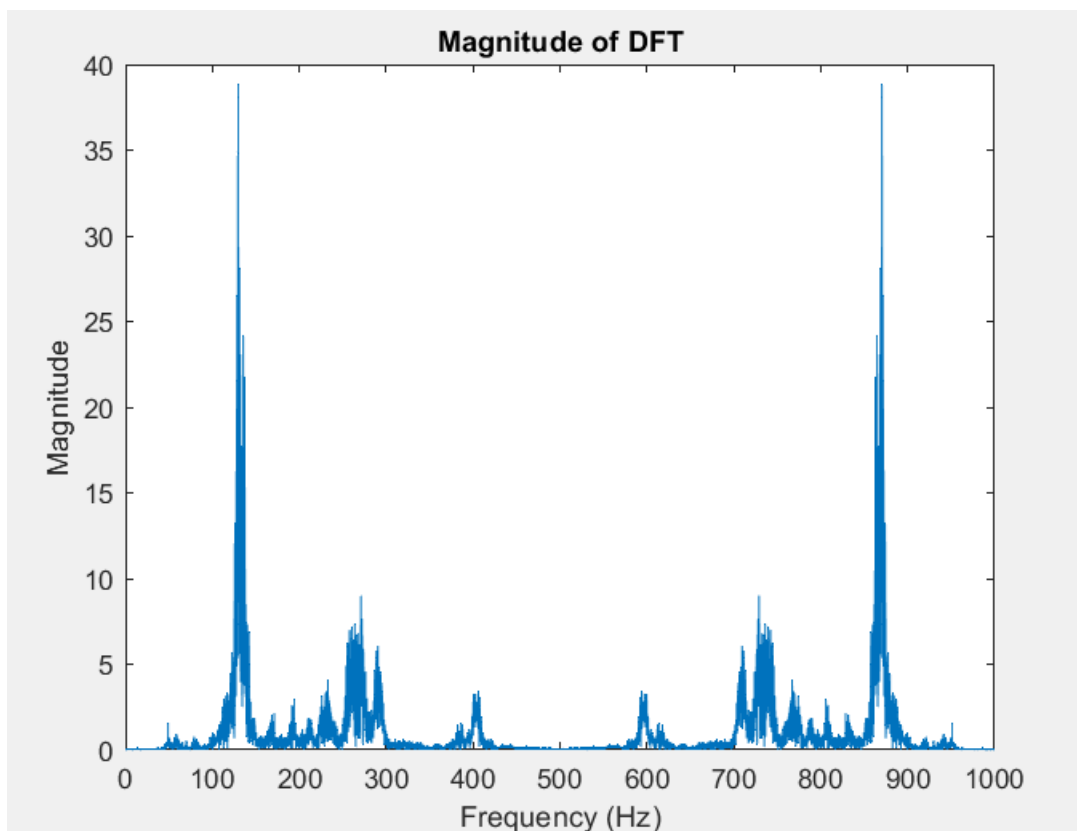
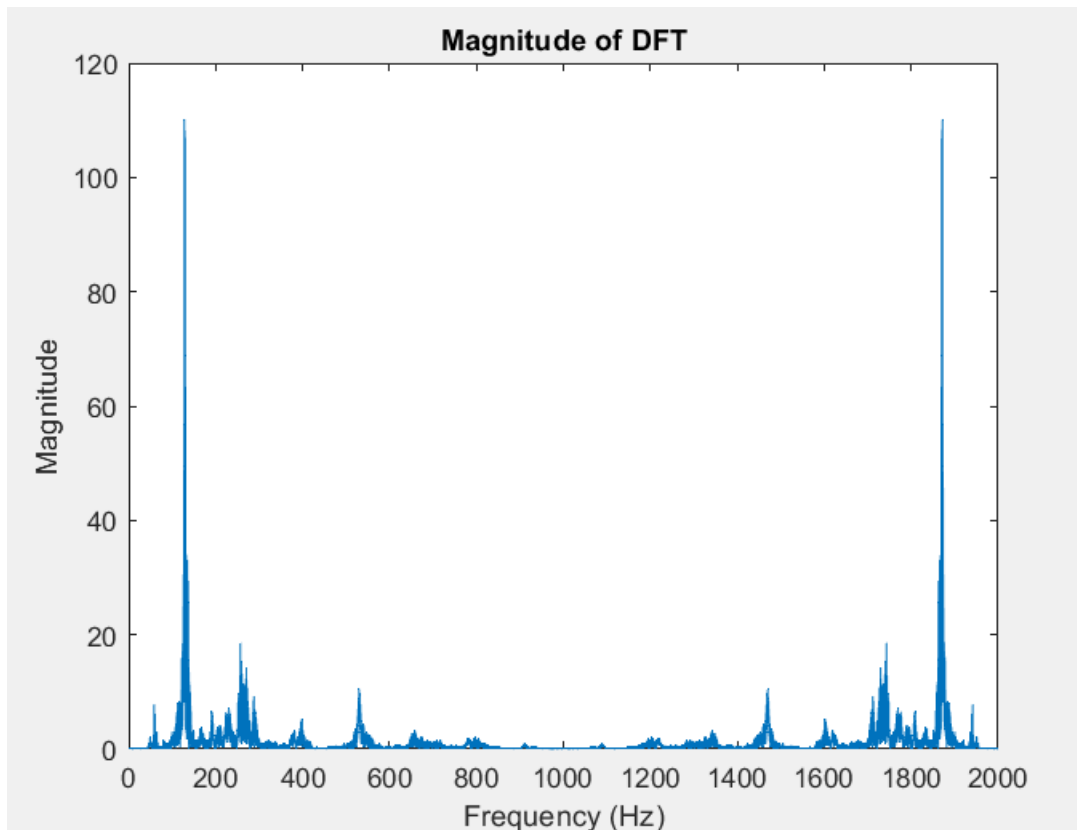


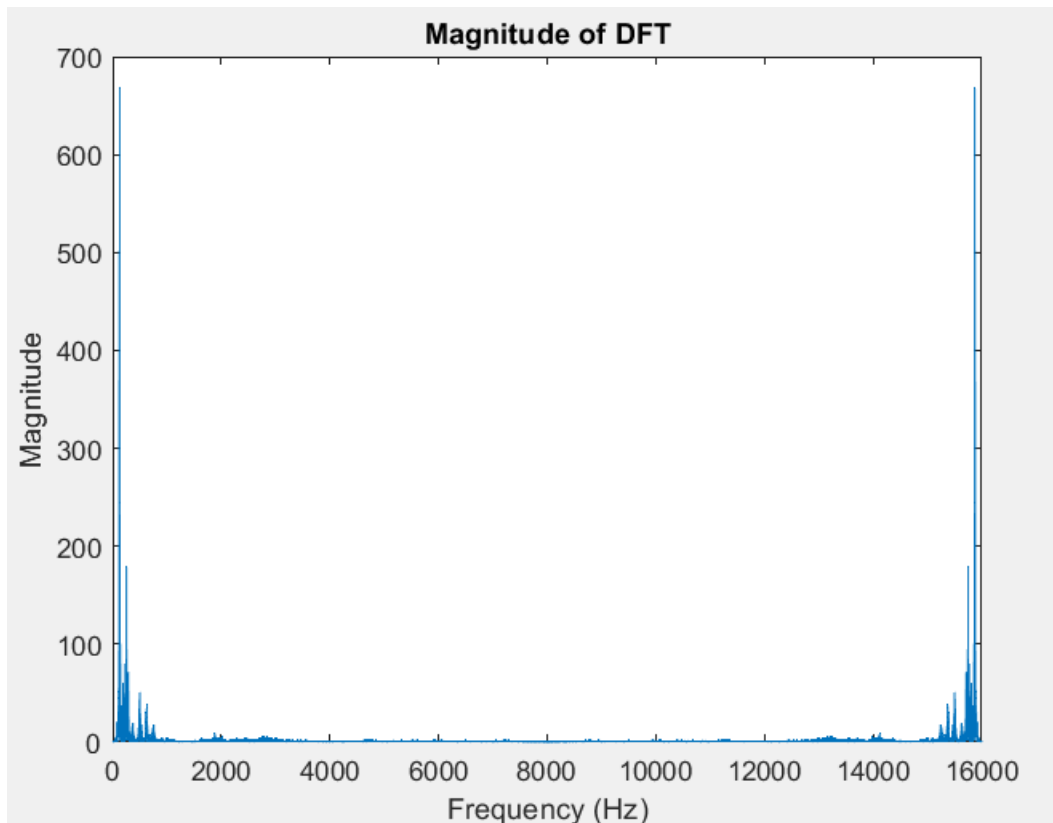
Sentence:- 2



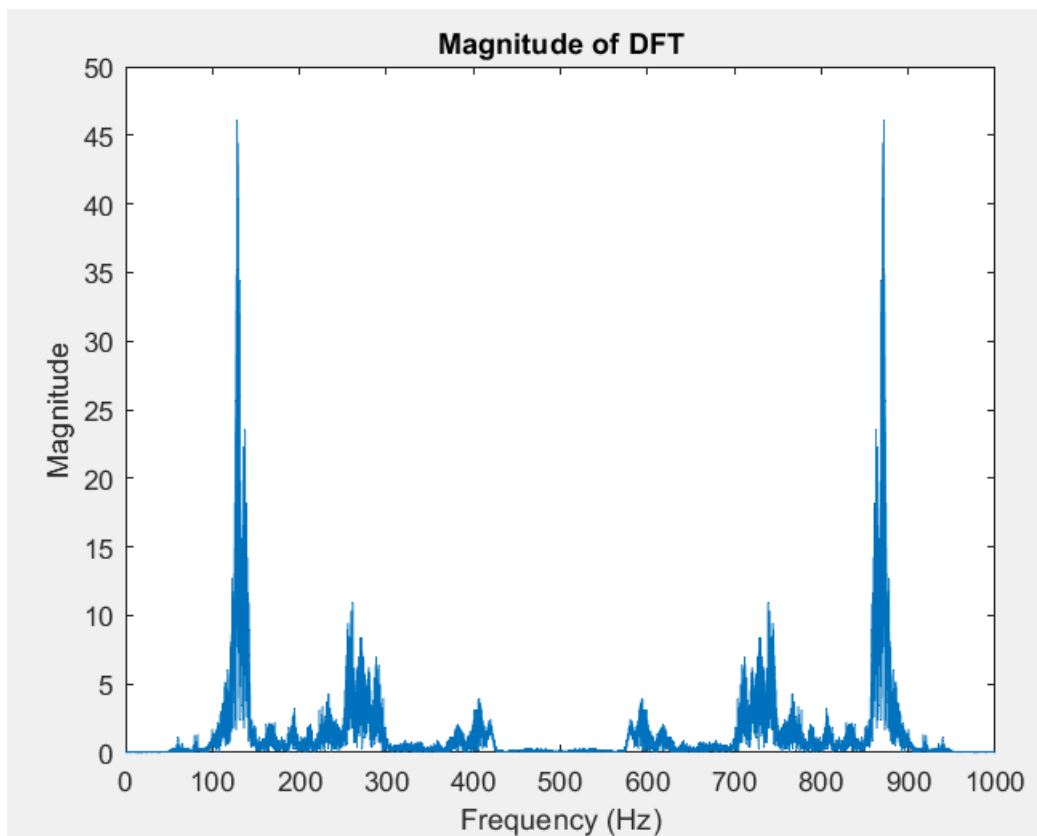


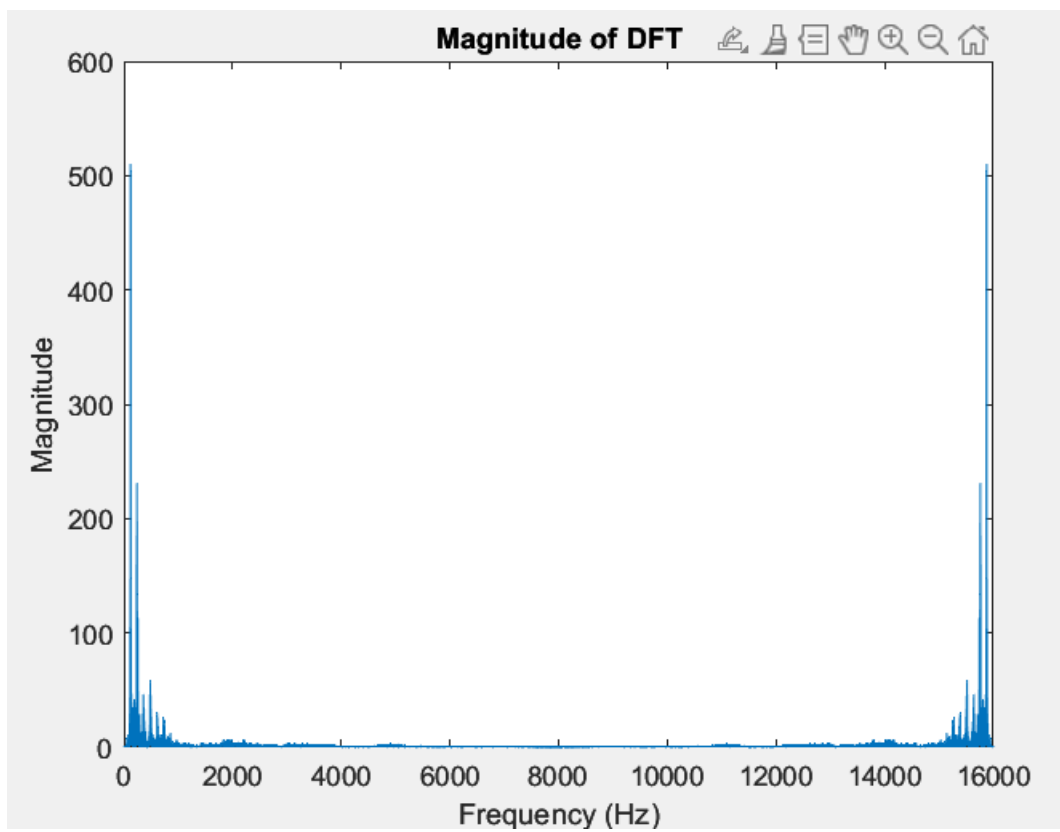
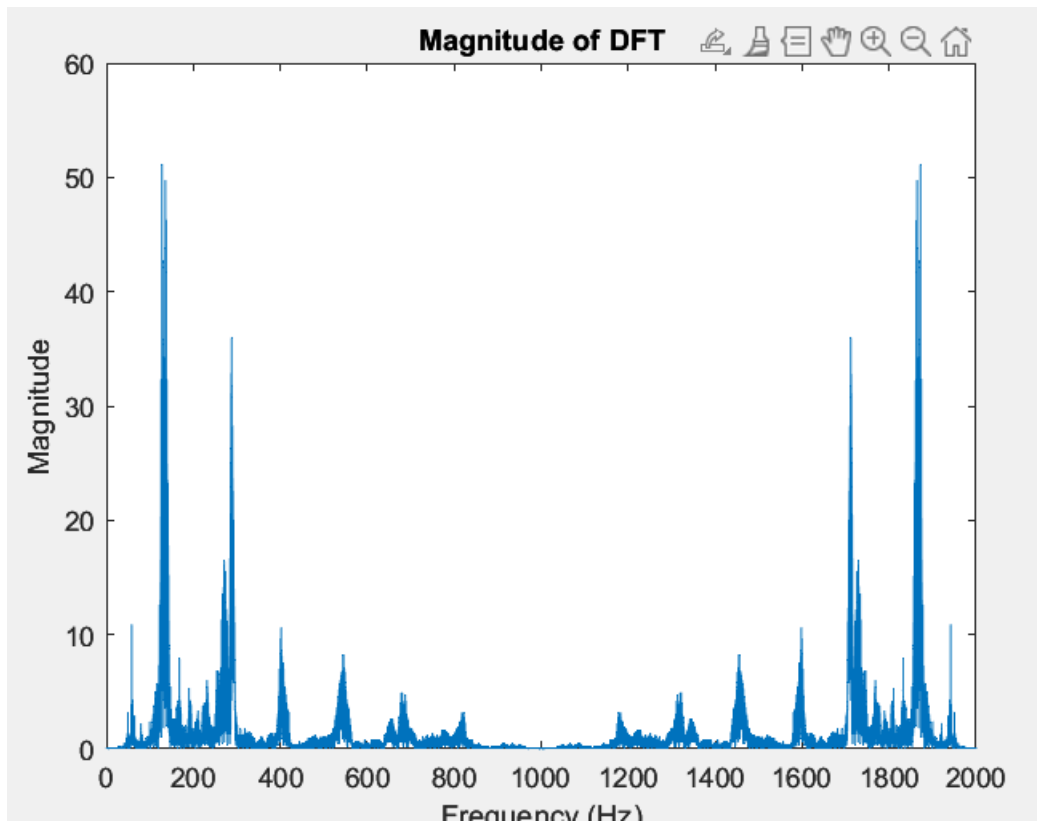
Sentence:- 3





Sentence:- 4

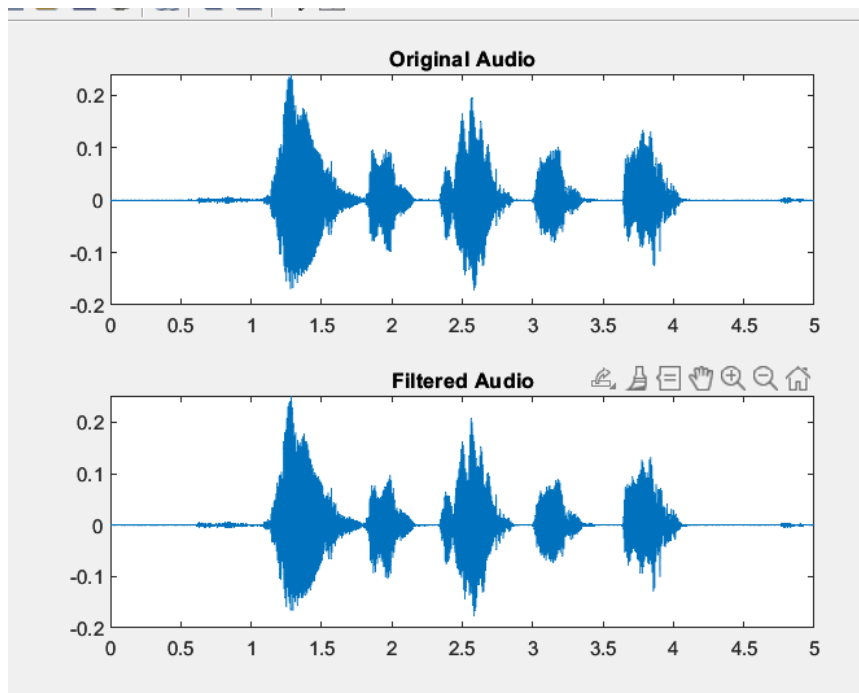




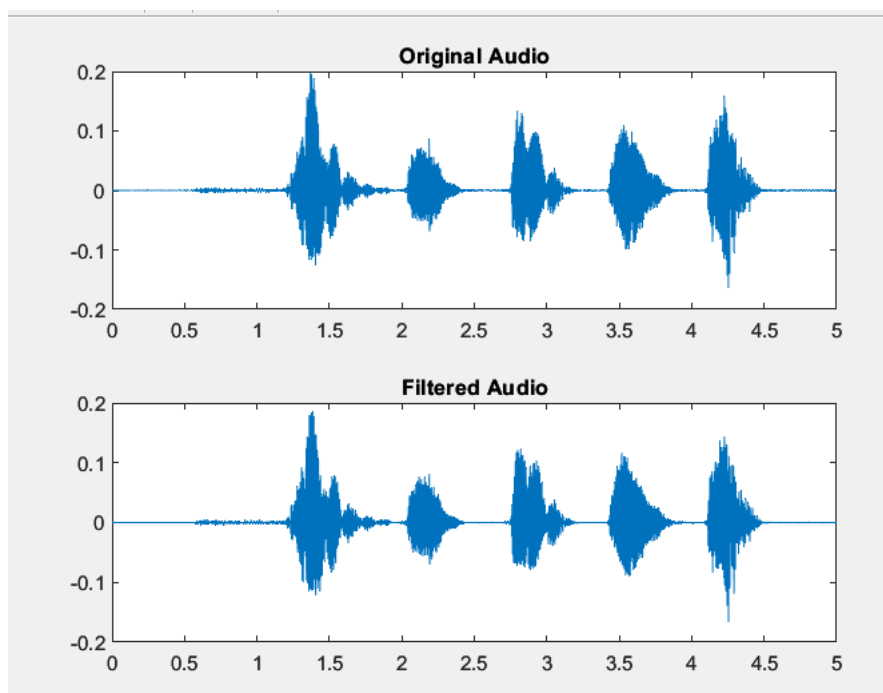
Graph of Original audio and Filtered audio:-

Sentence:- 1

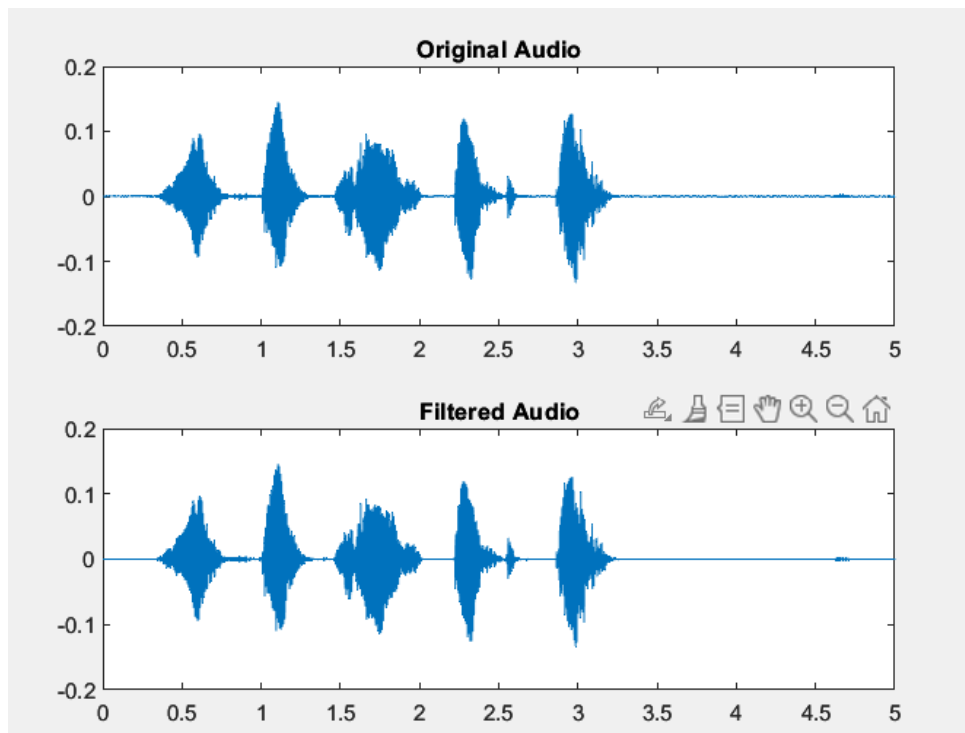
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz

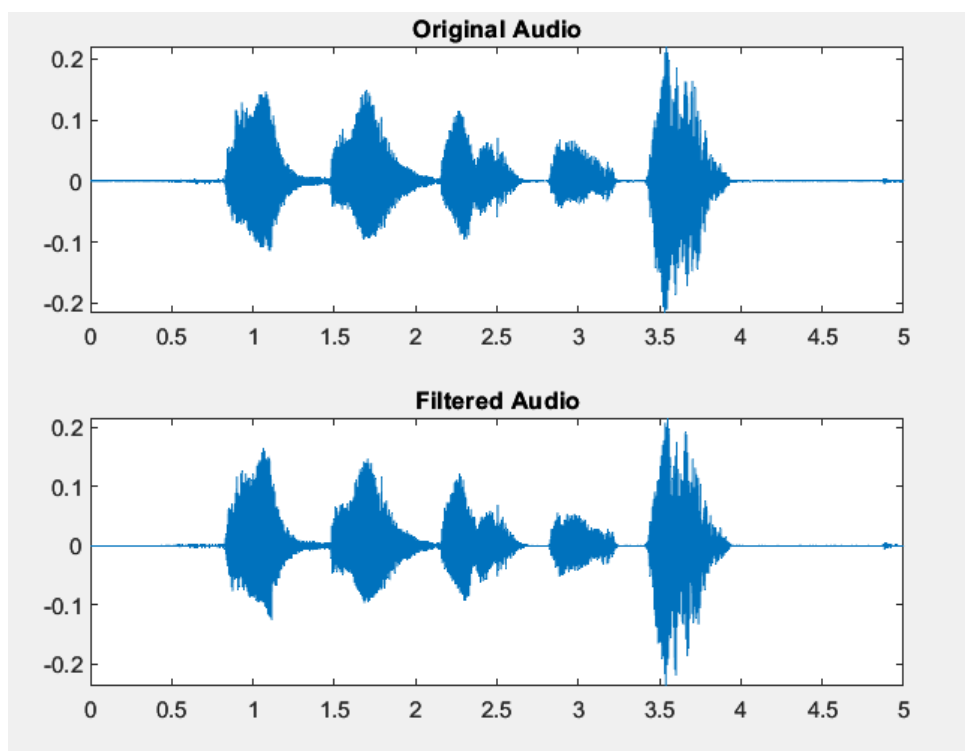


- Sampling frequency: 16000 Hz

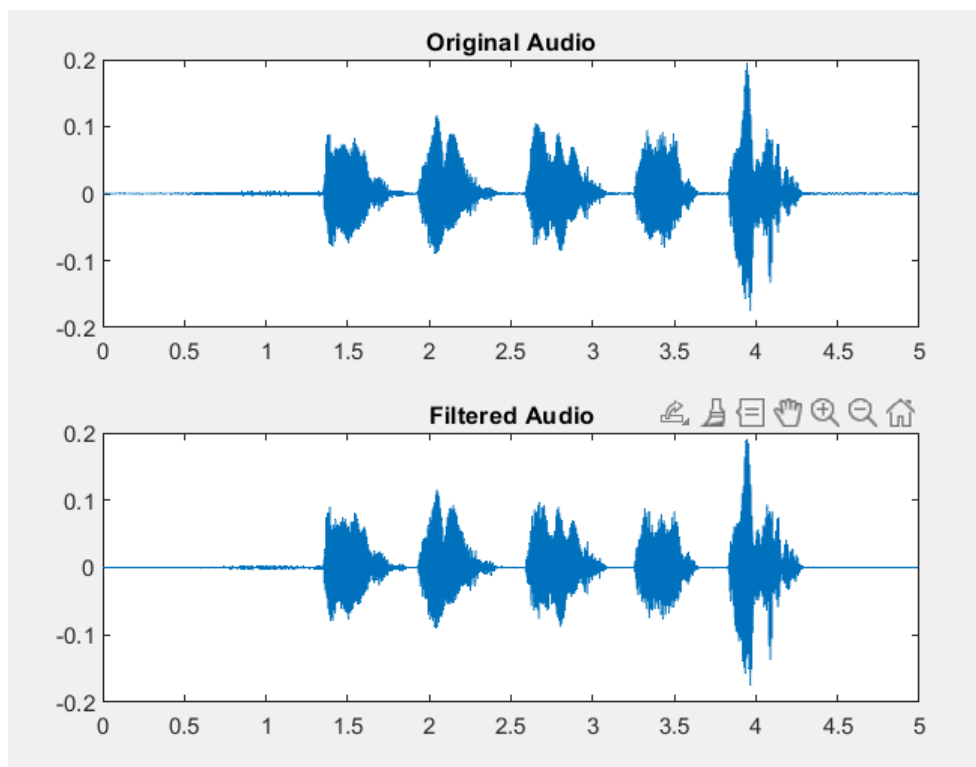


Sentence:- 2

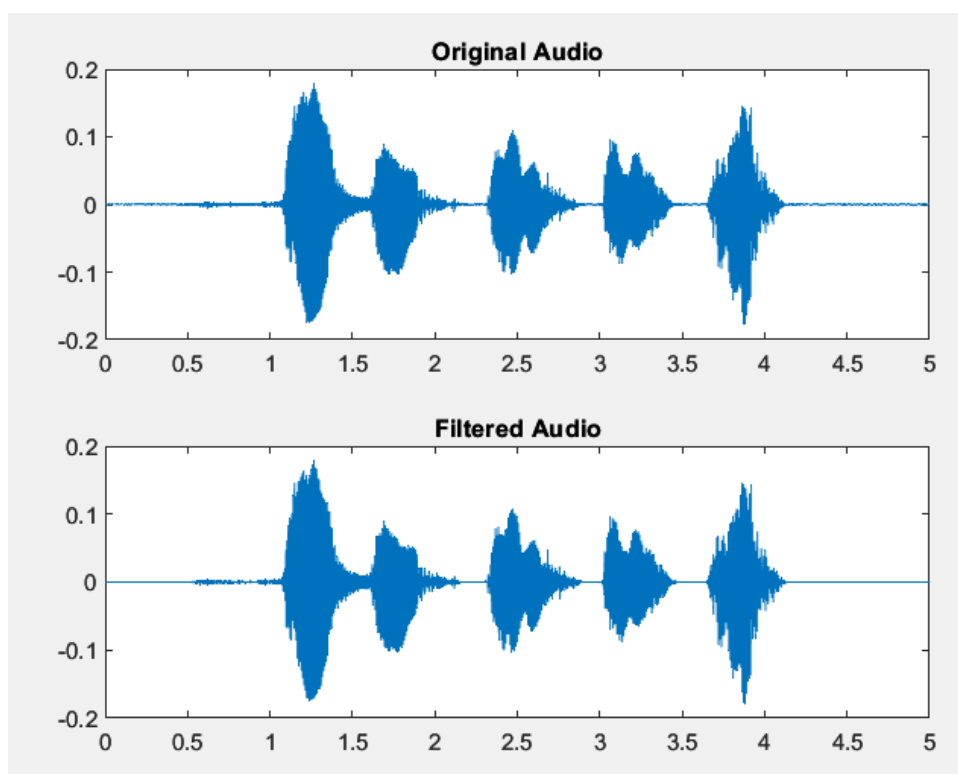
- Sampling frequency : 1000 Hz



- Sampling frequency : 2000 Hz

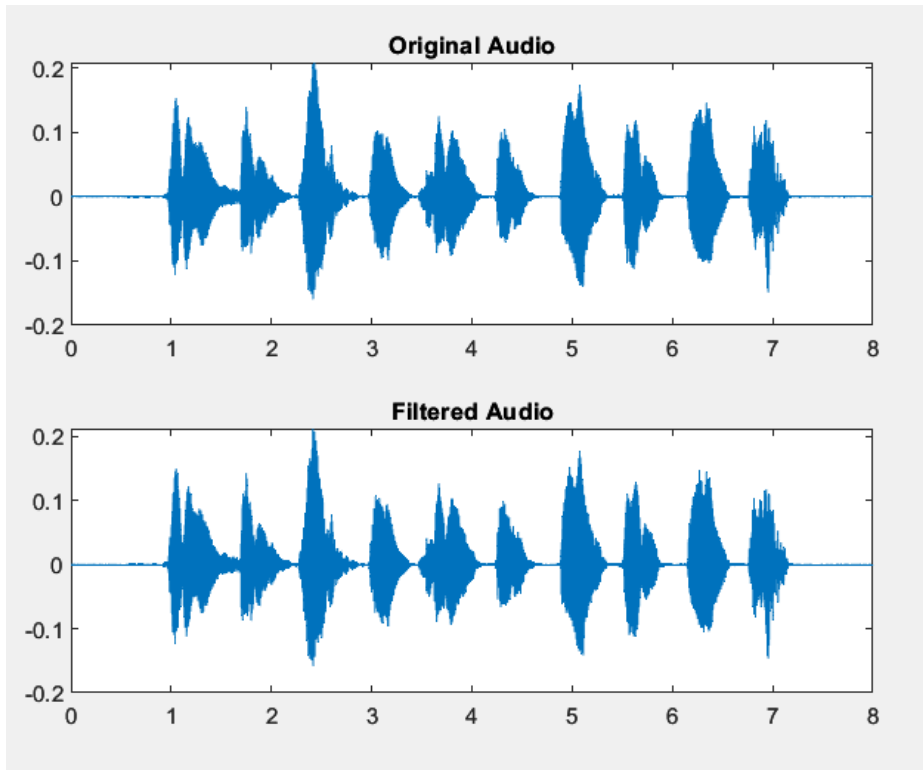


- Sampling frequency : 16000 Hz

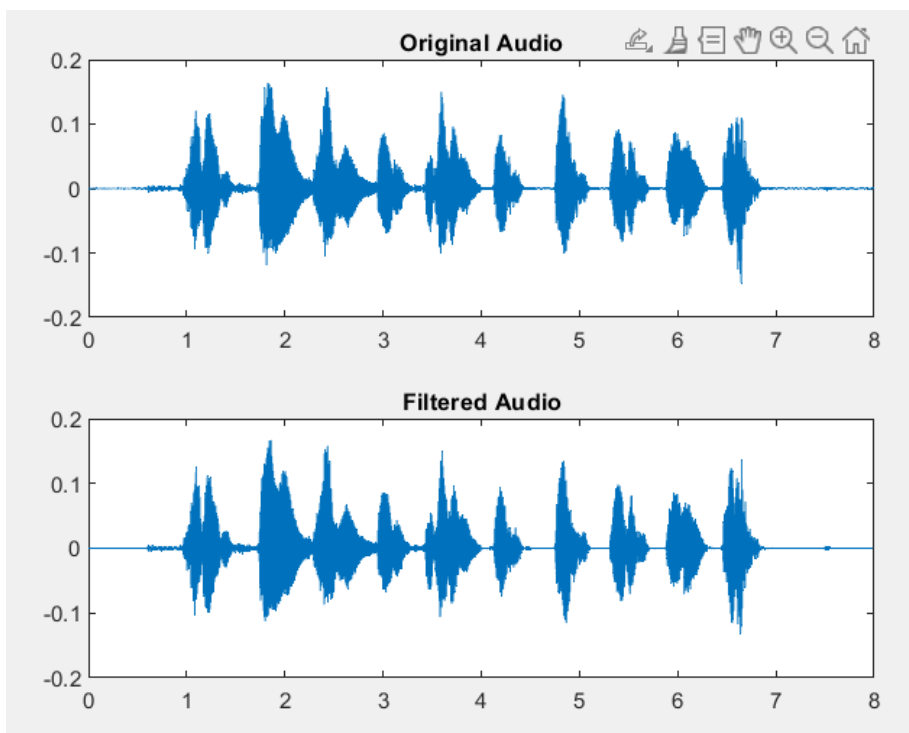


Sentence:- 3

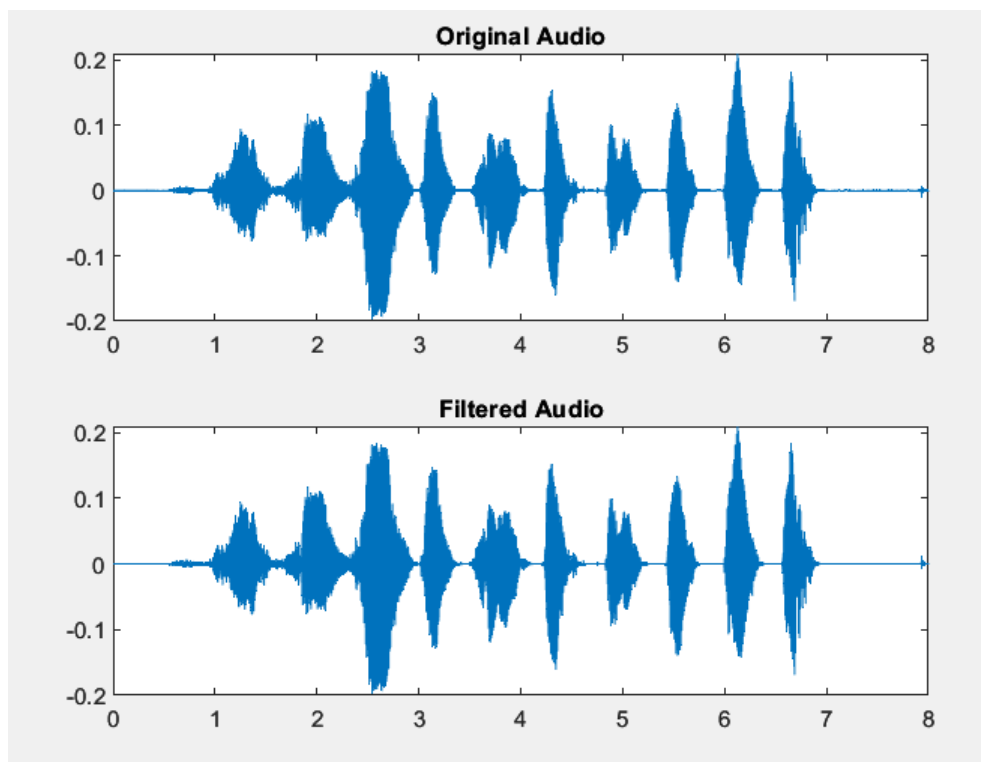
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz

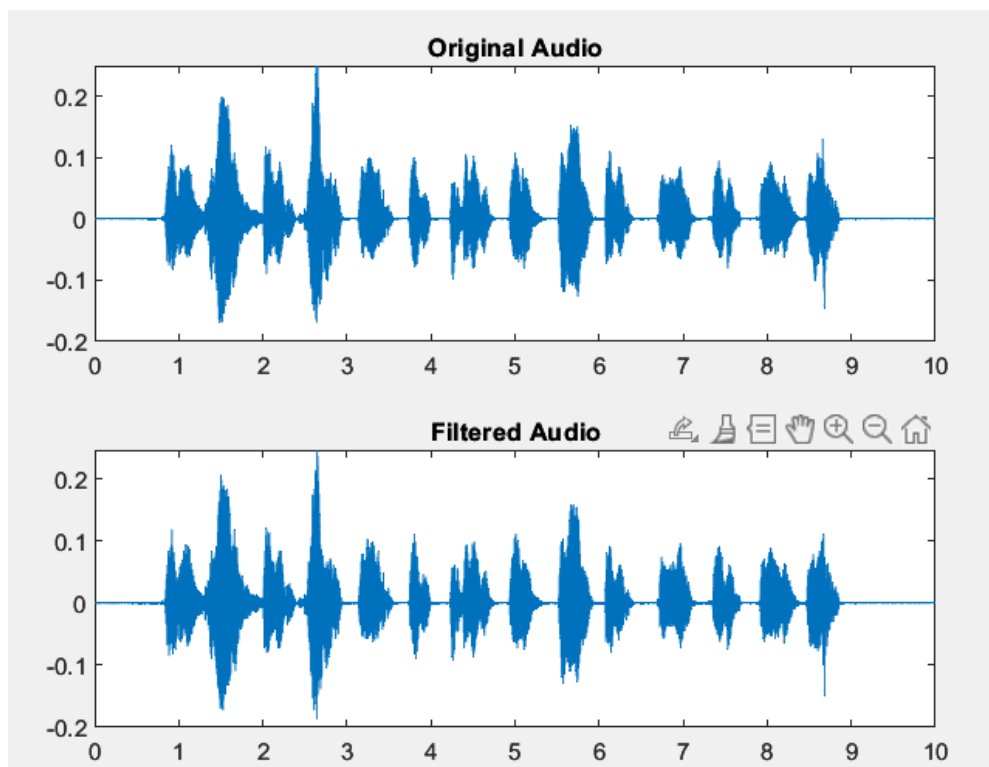


- Sampling frequency : 16000 Hz

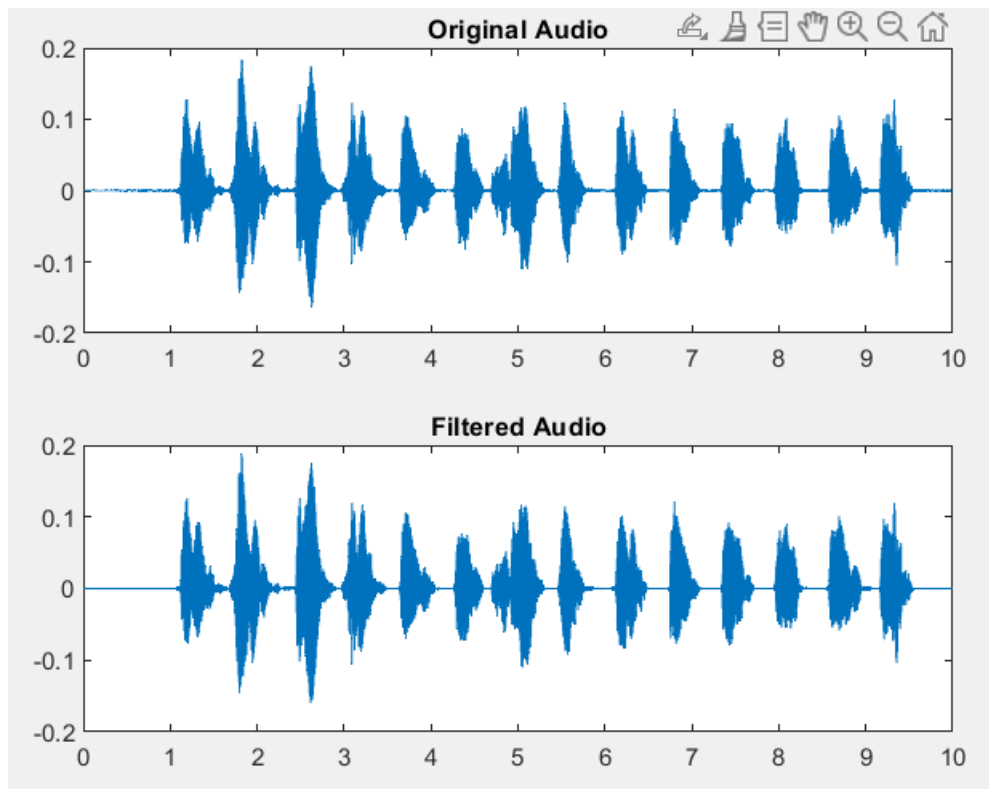


Sentence:- 4

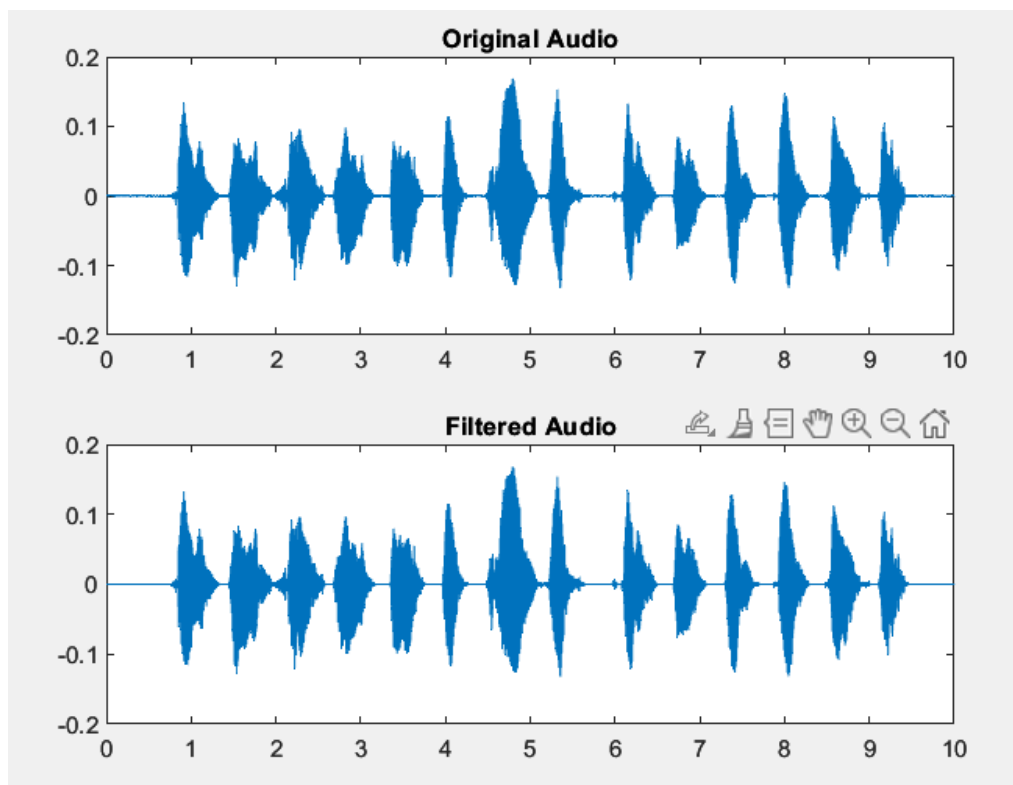
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz



- Sampling frequency: 16000 Hz



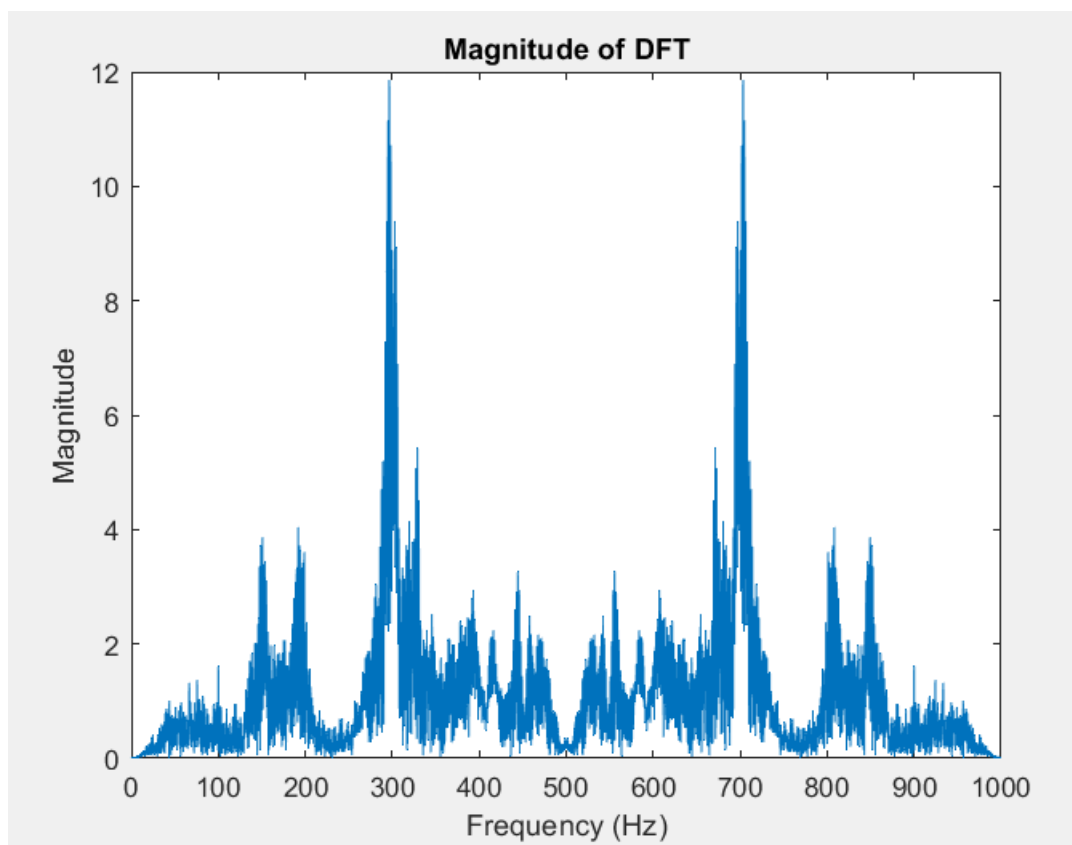
- Prince Kumar Jain:-

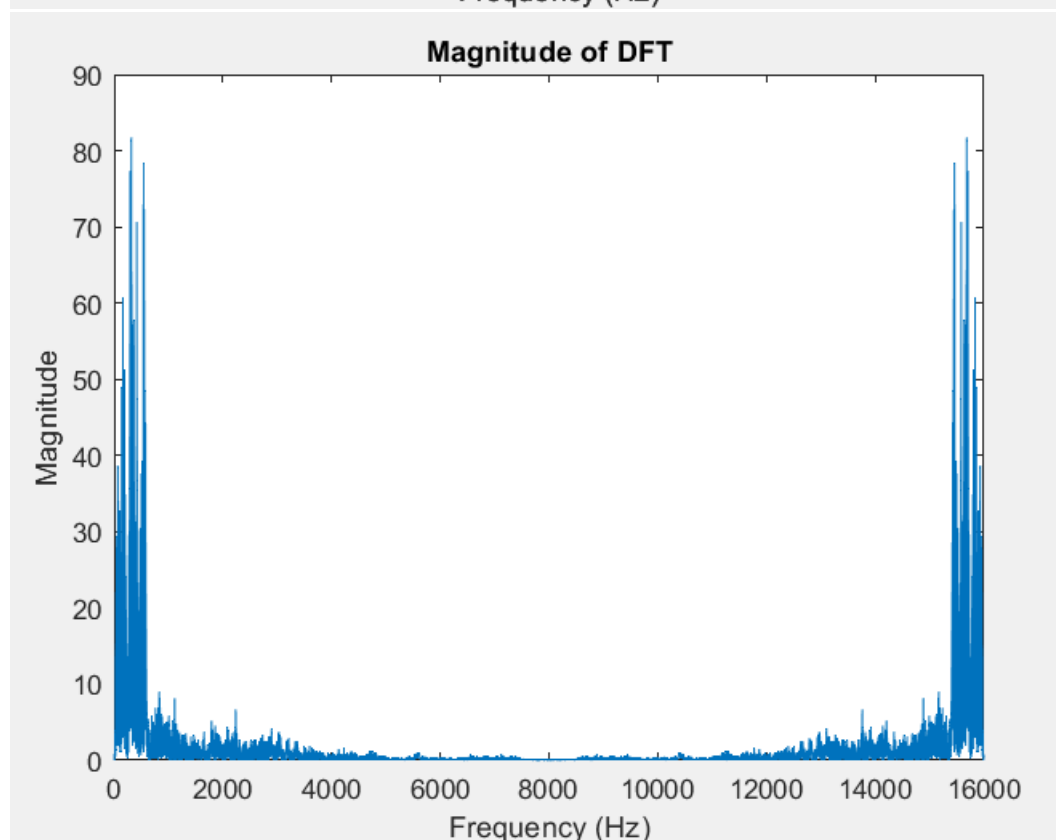
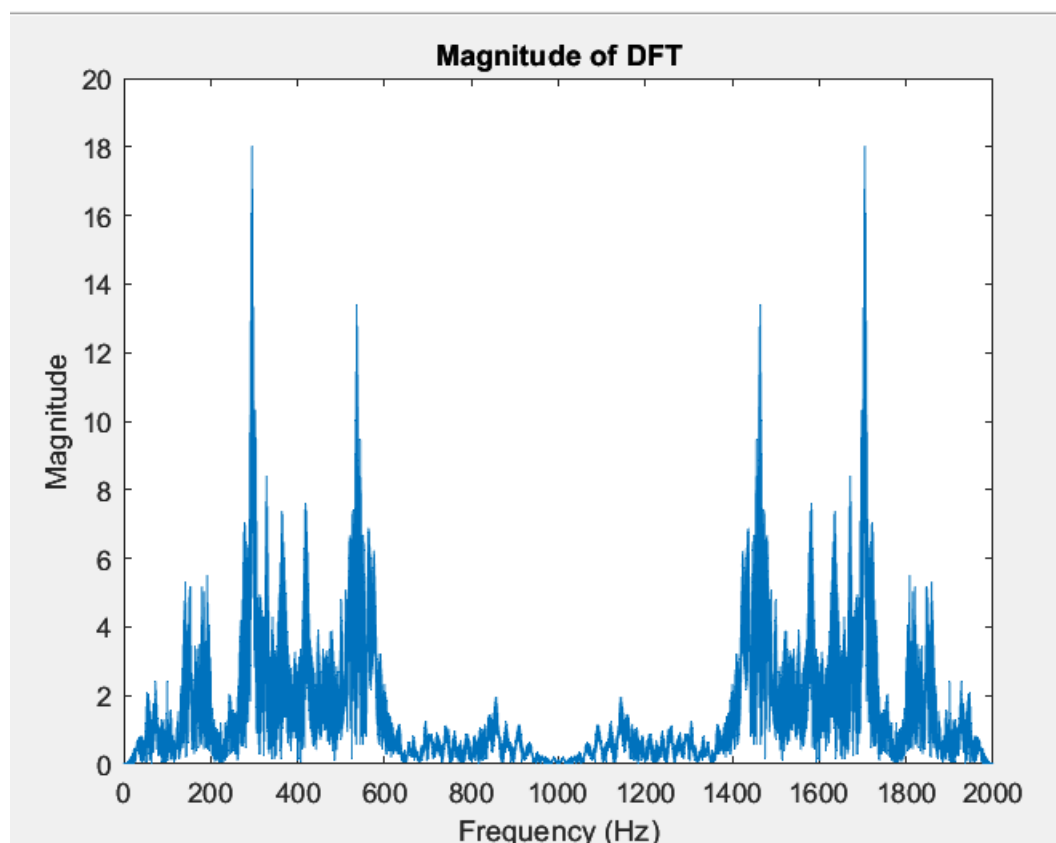
Frequencies present in audio signals:-

	1000(Hz)	2000(Hz)	16000(Hz)
Sentence: 1	296.6	295.0	317.4
Sentence: 2	303.6	302.4	329.6
Sentence: 3	294.38	304.88	312.88
Sentence: 4	297.0	111.80	280.30

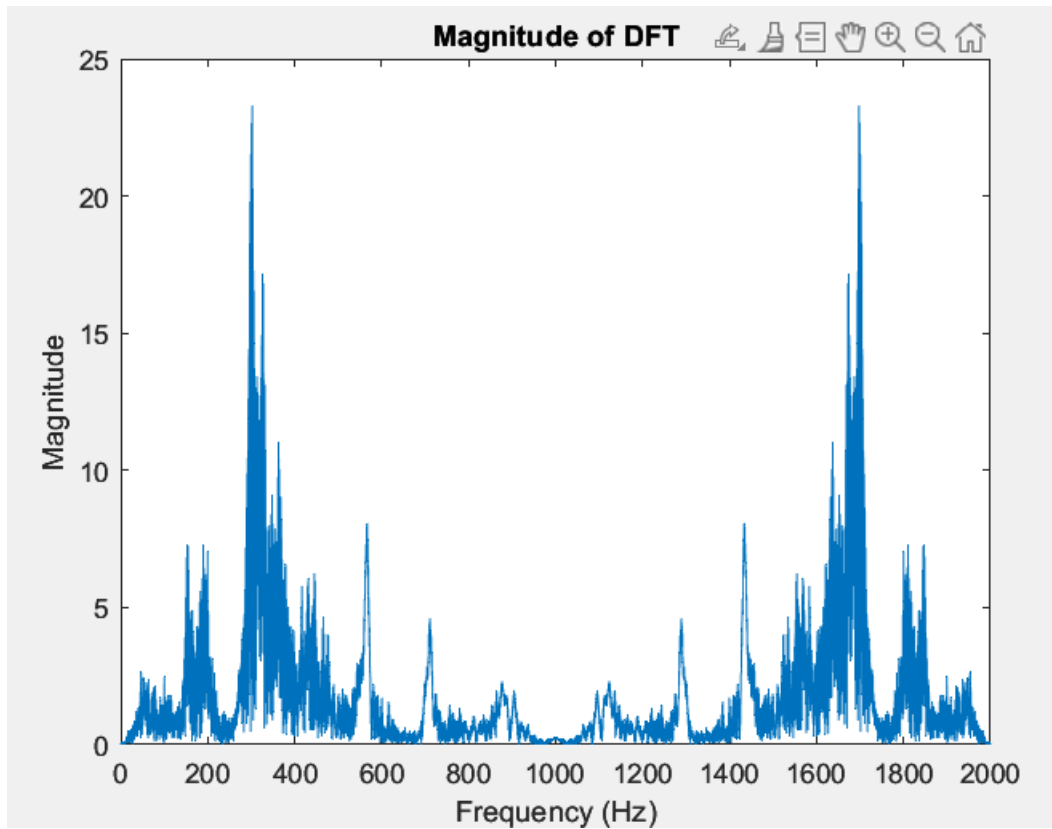
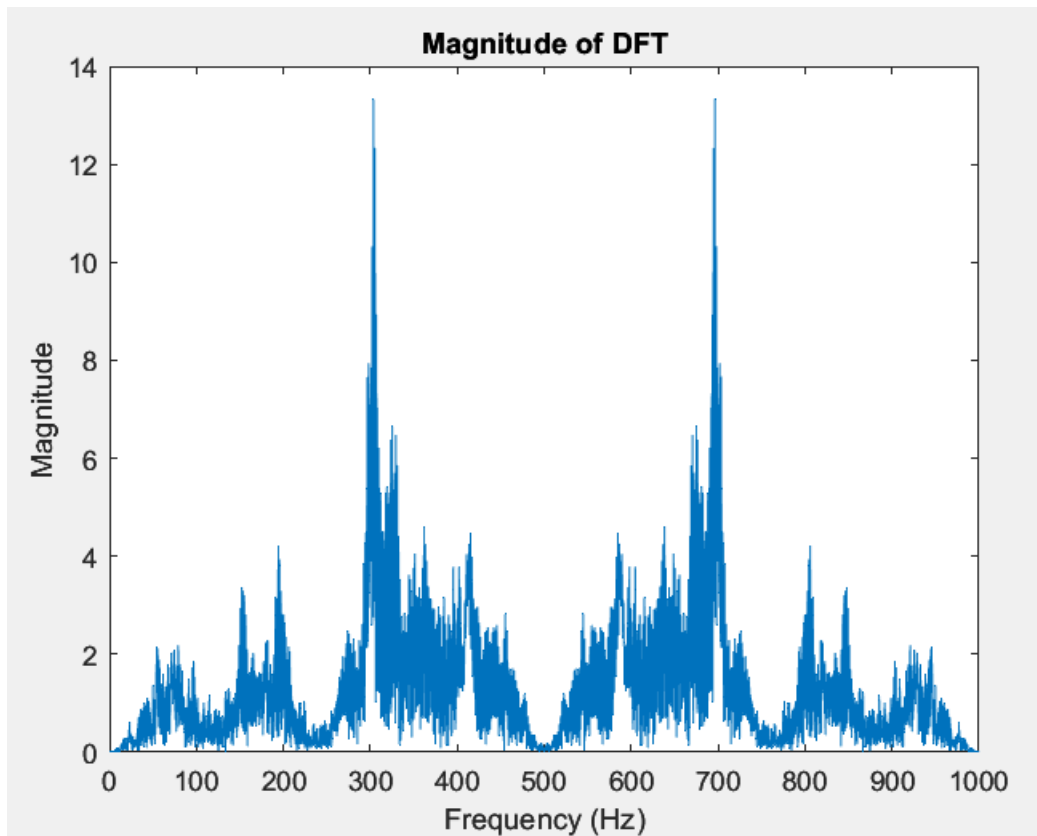
Graph between frequency and magnitude of Discrete Fourier Transform :-

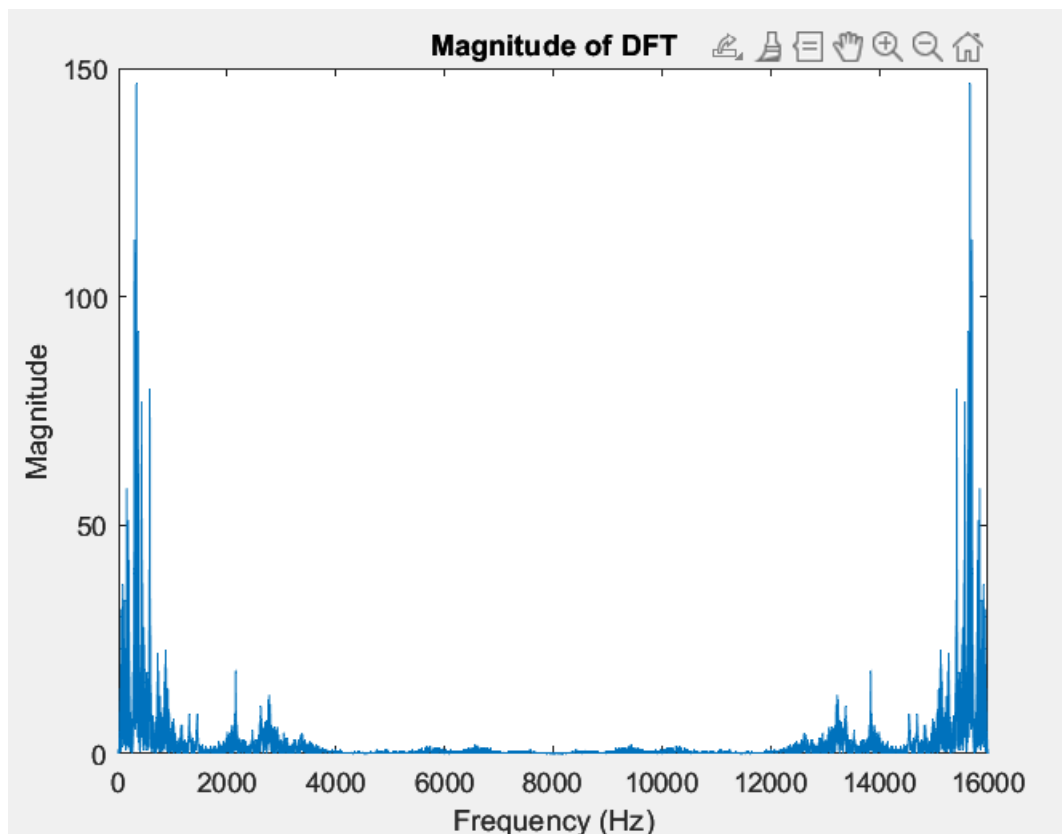
Sentence:- 1



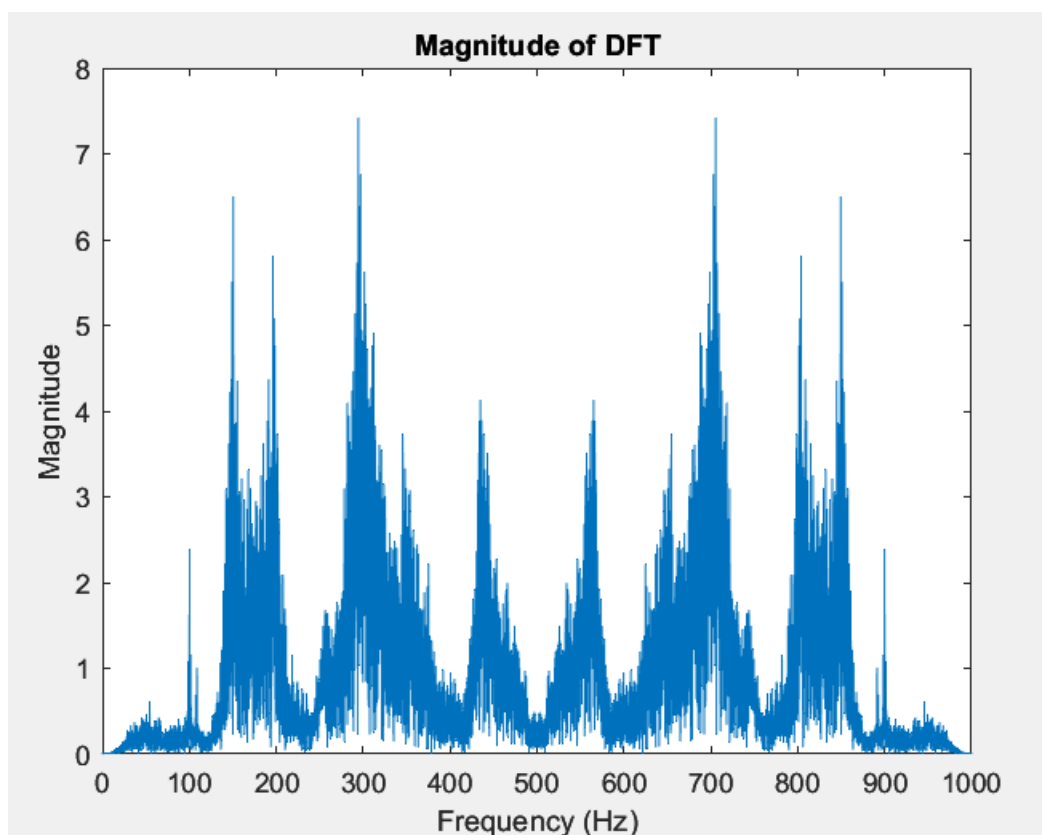


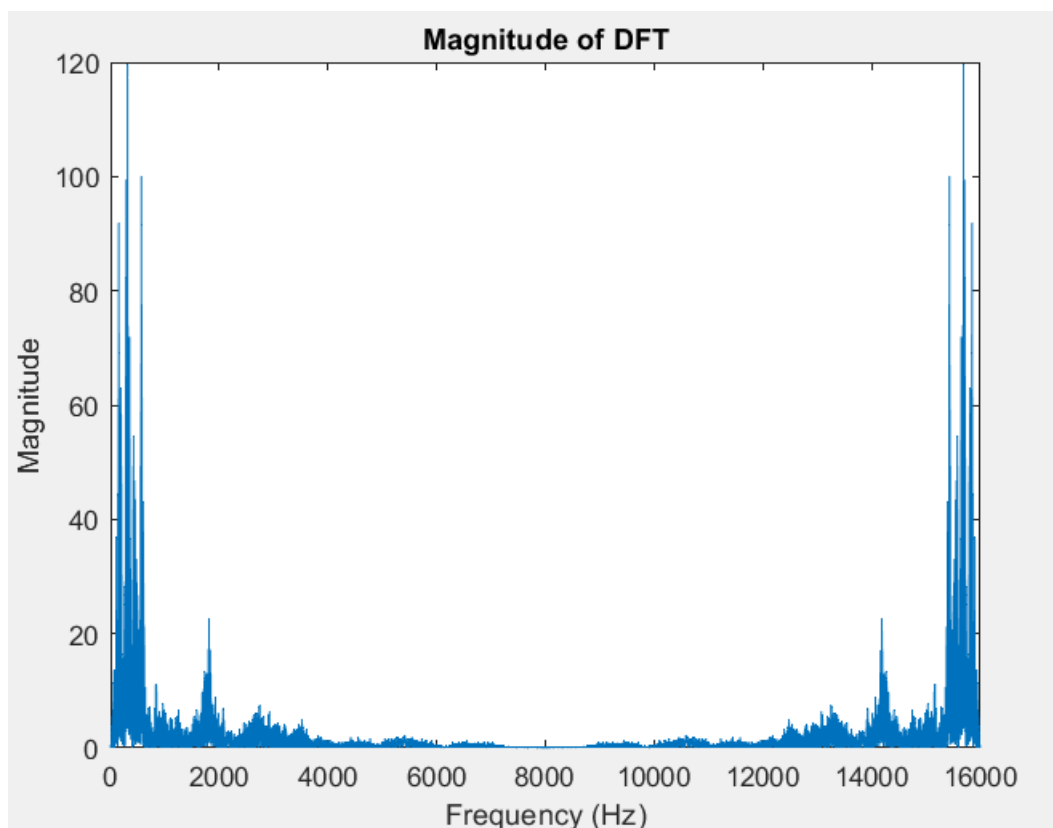
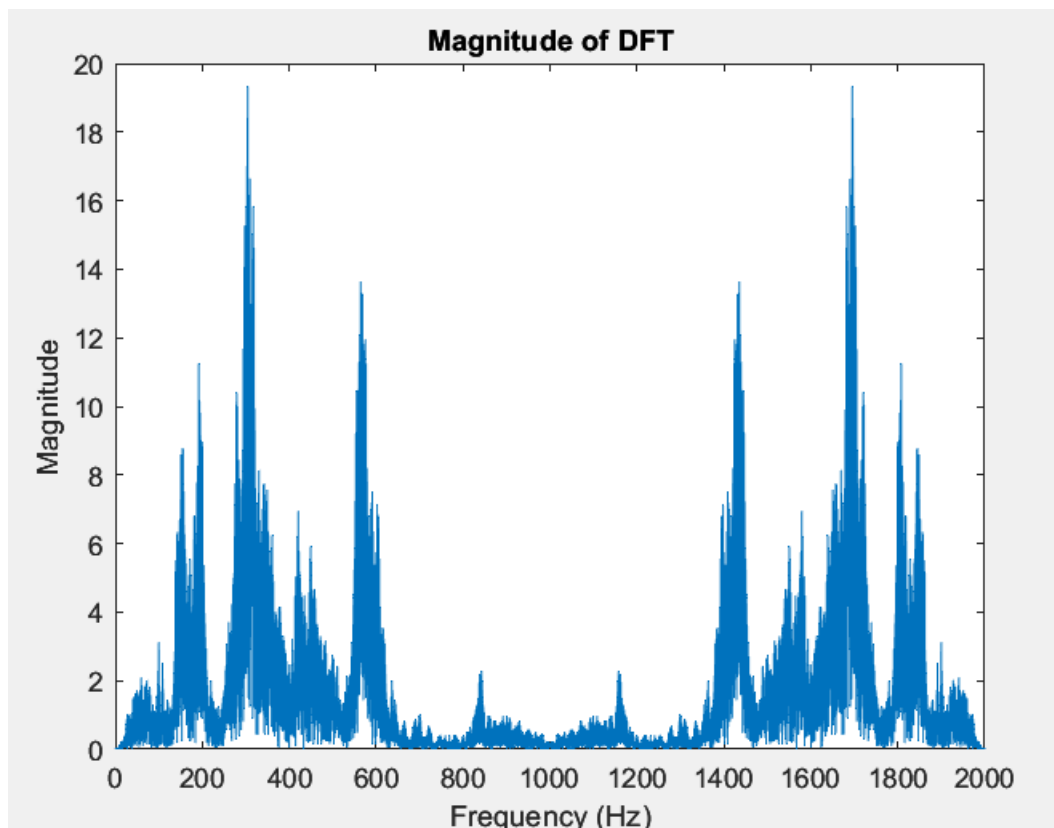
Sentence:- 2



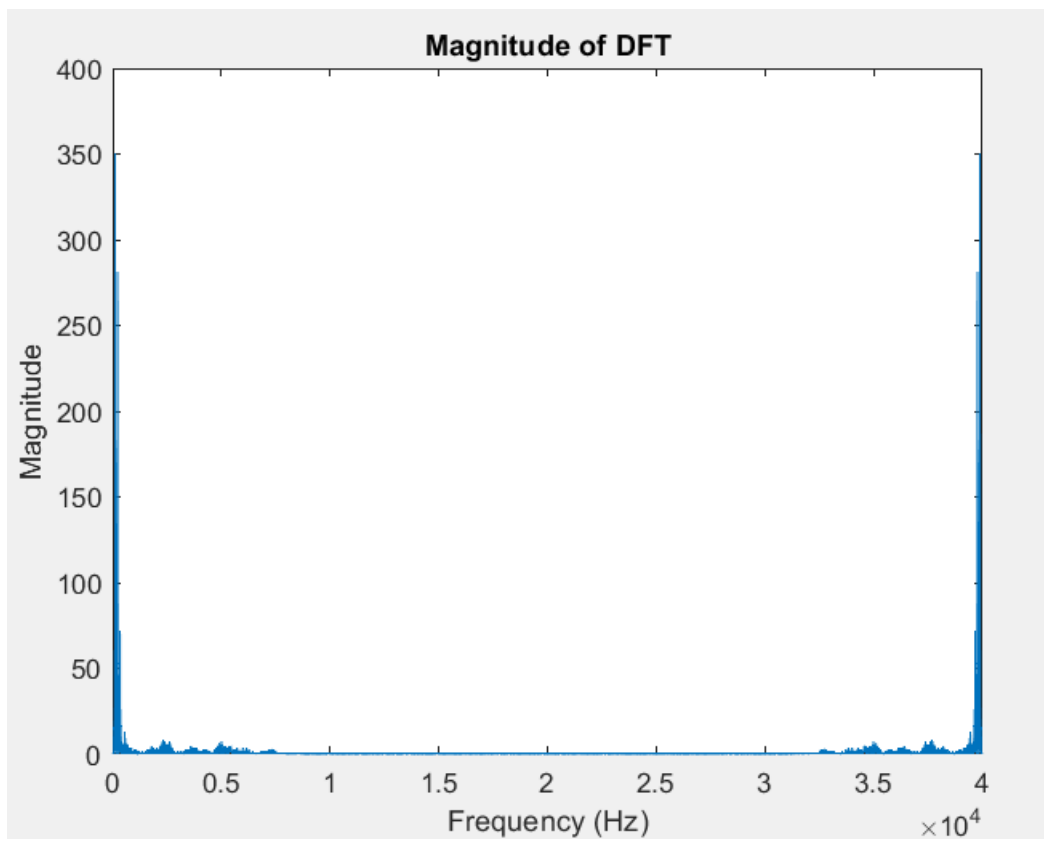
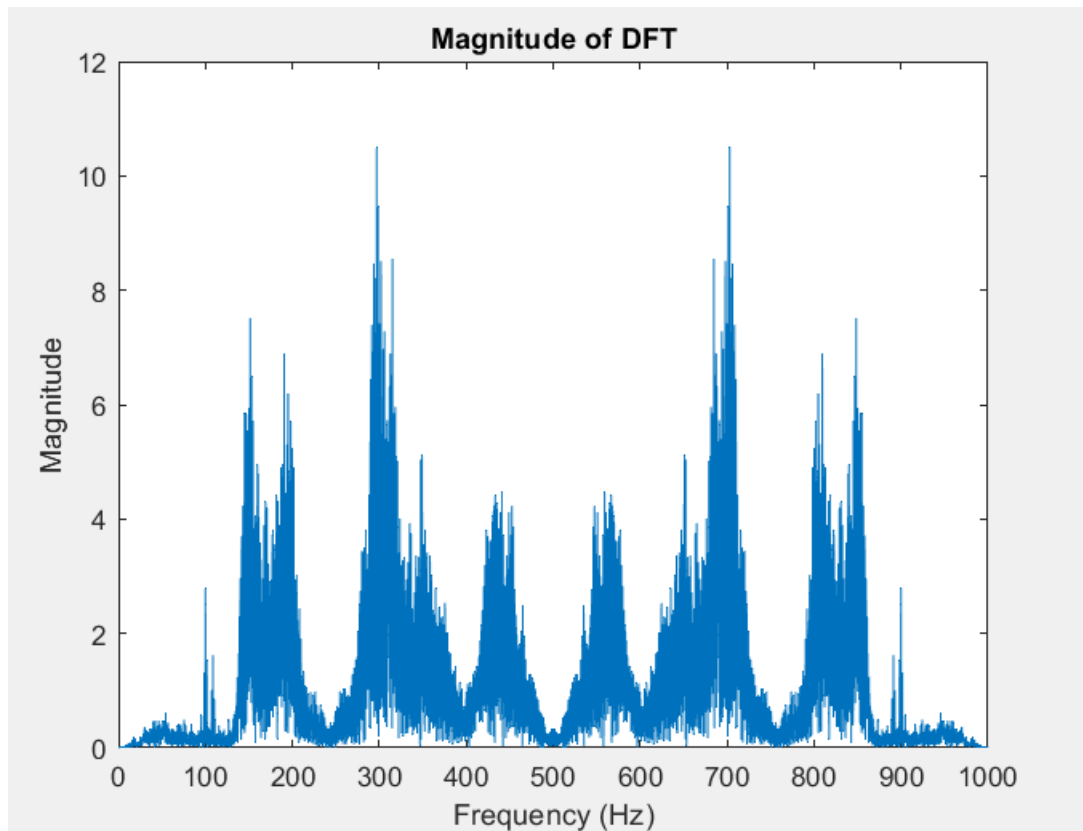


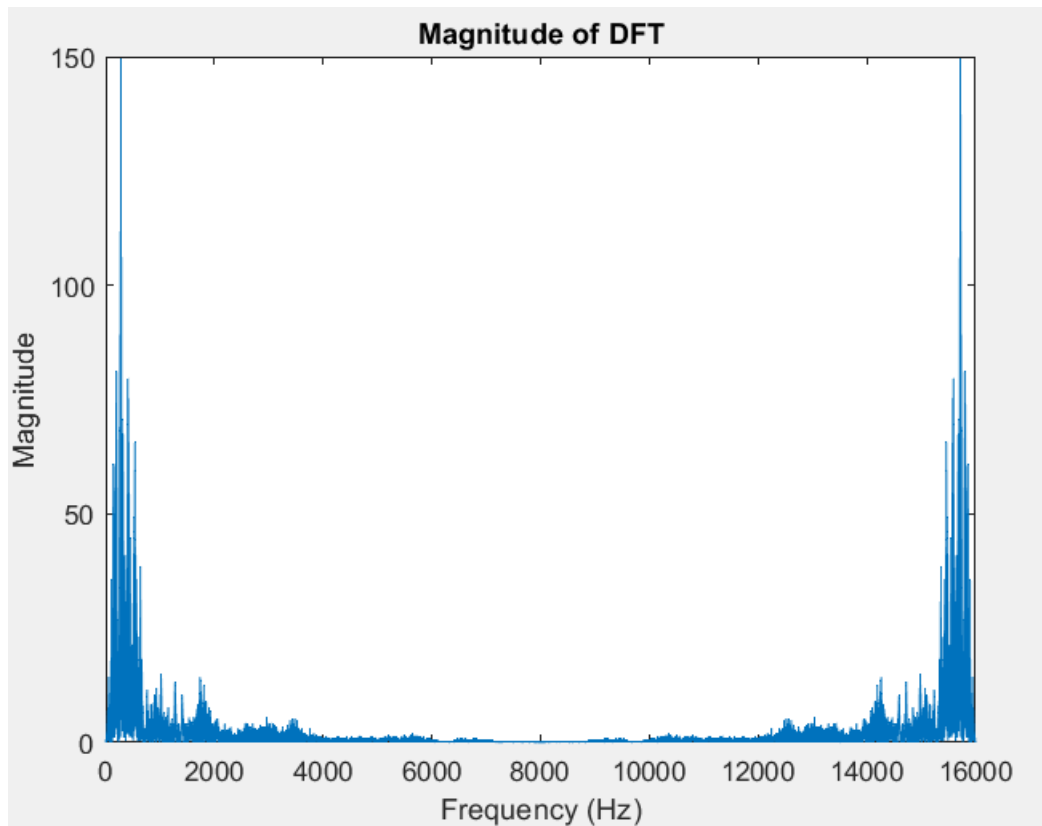
Sentence:- 3





Sentence:- 4

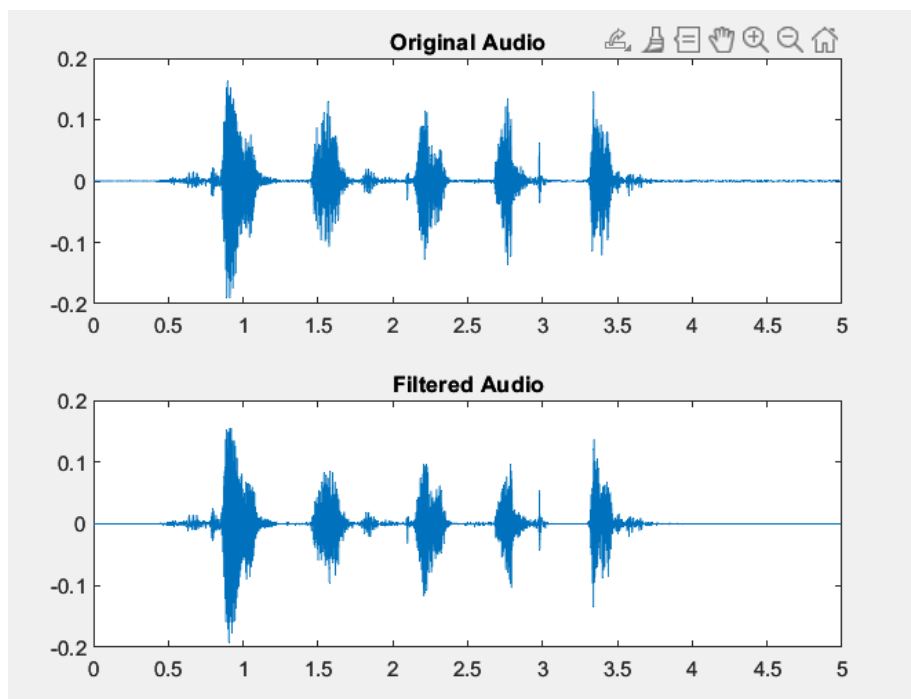




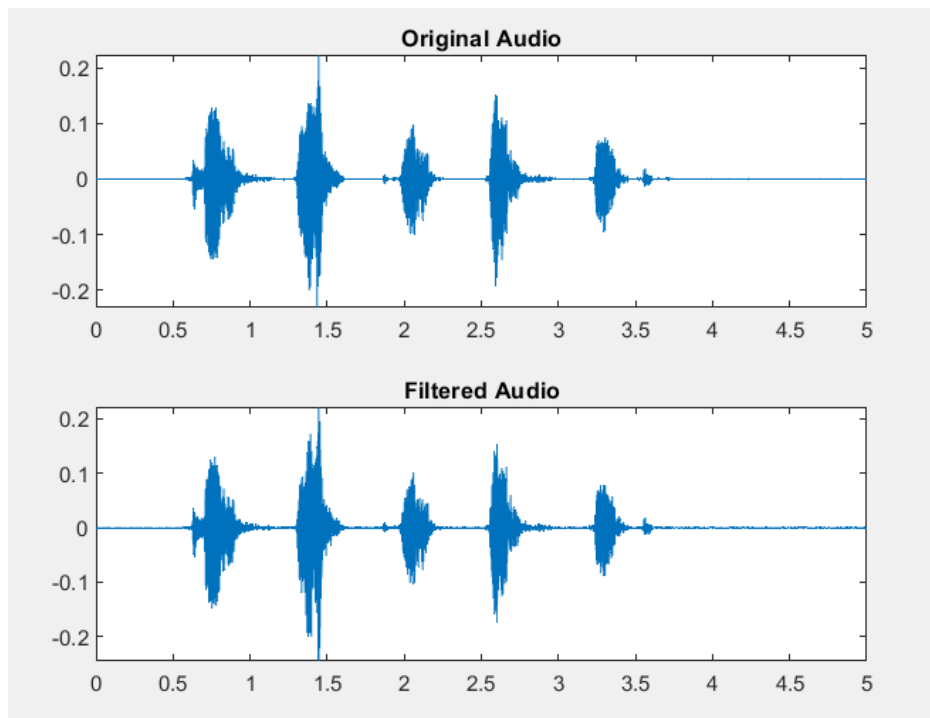
Graph of Original audio and Filtered audio:-

Sentence:- 1

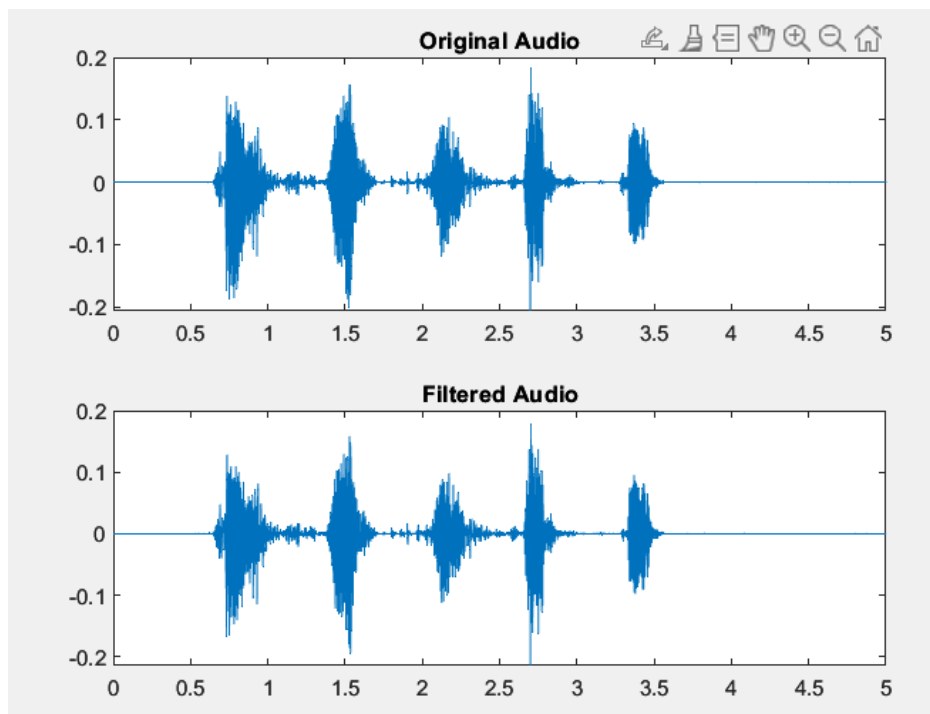
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz

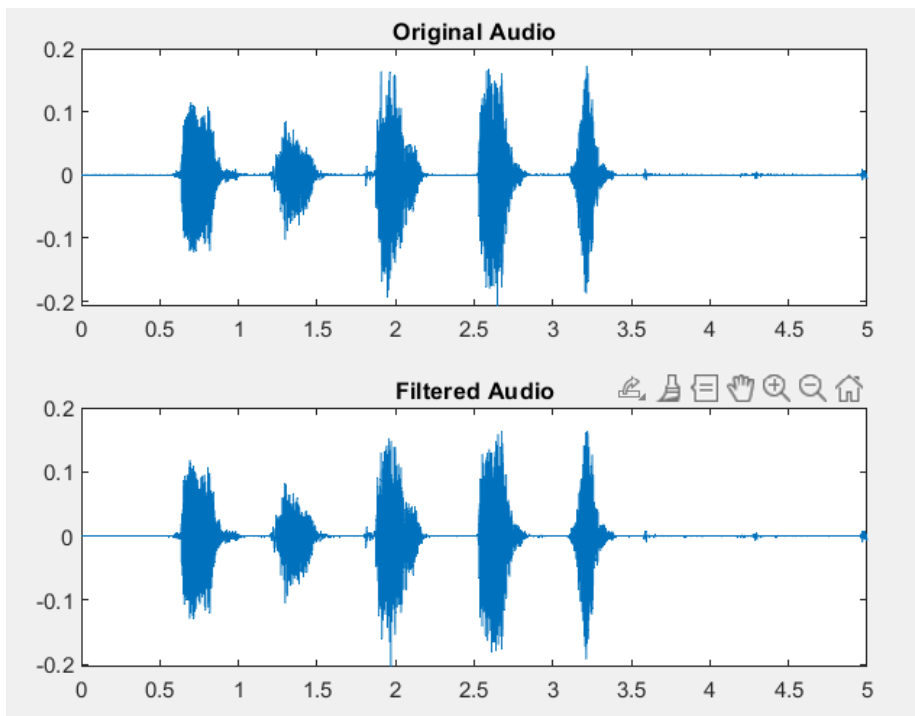


- Sampling frequency: 16000 Hz

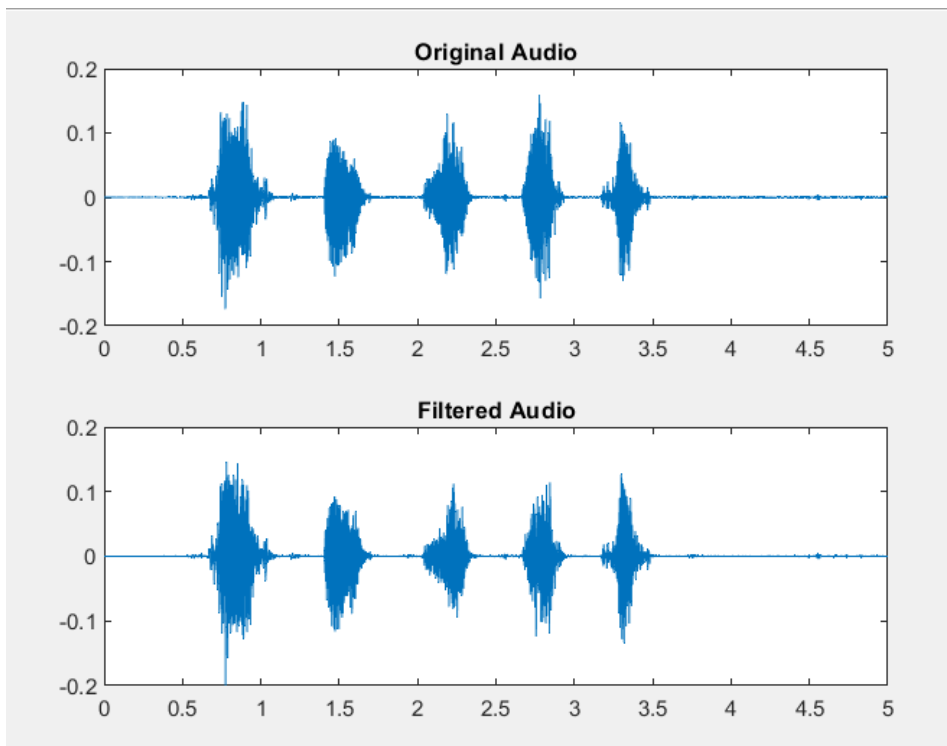


Sentence:- 2

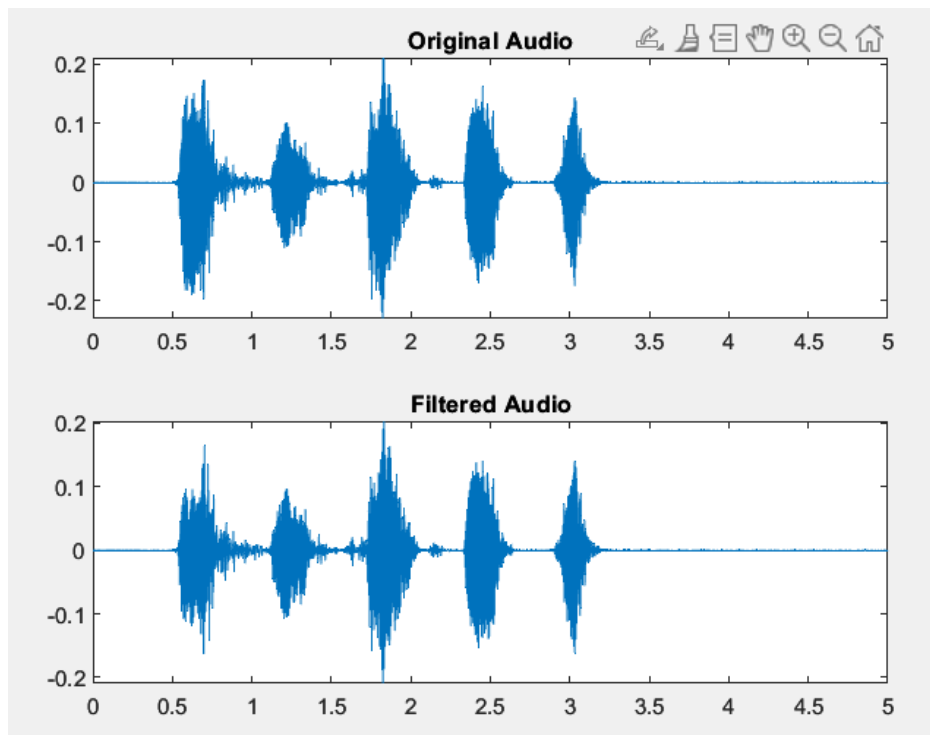
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz

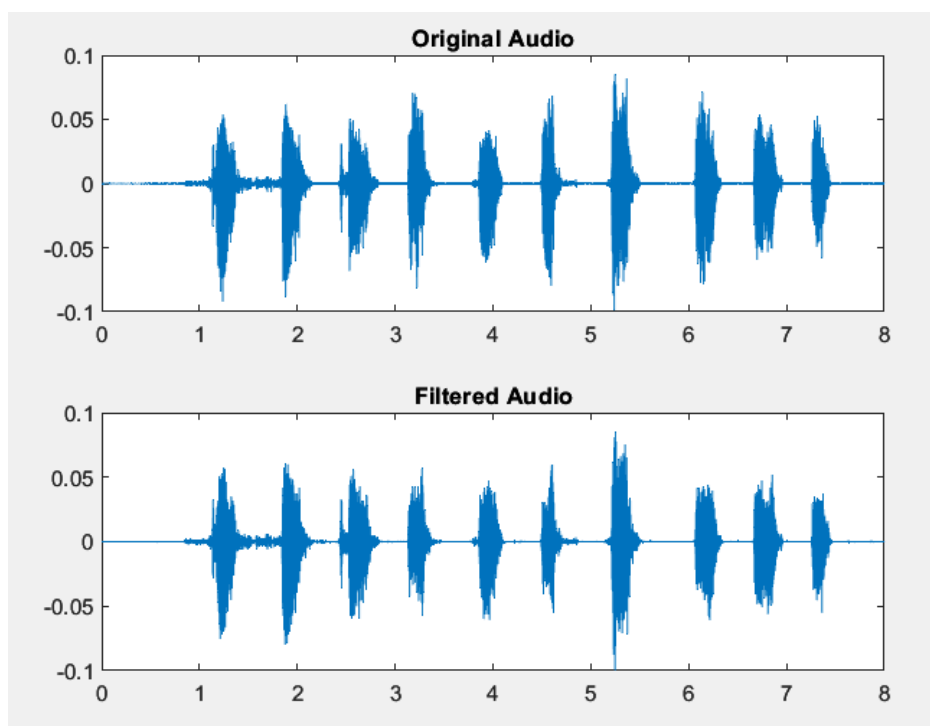


- Sampling frequency: 16000 Hz

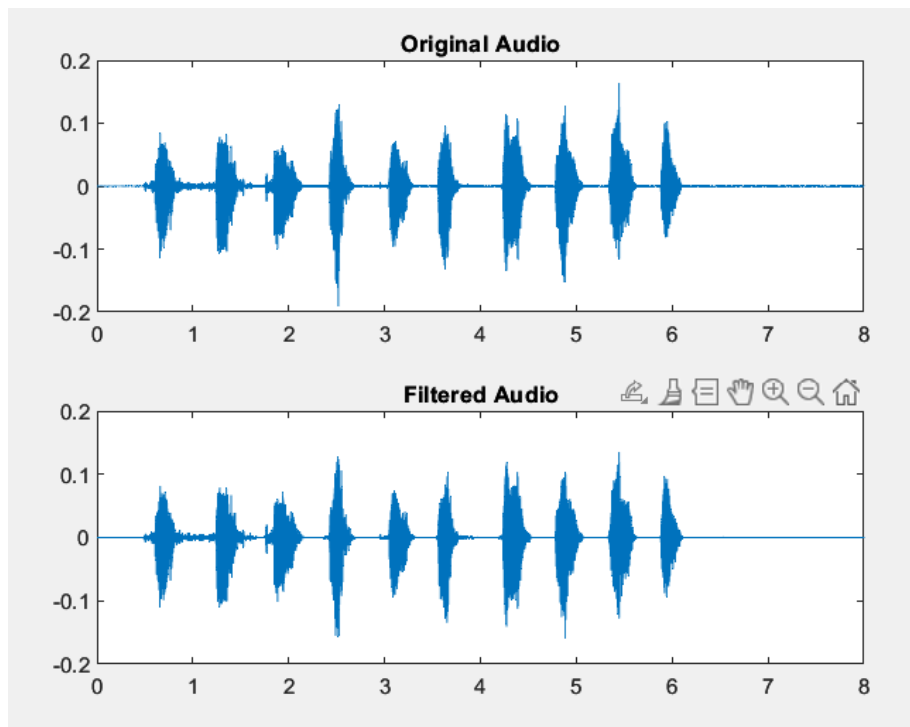


Sentence:- 3

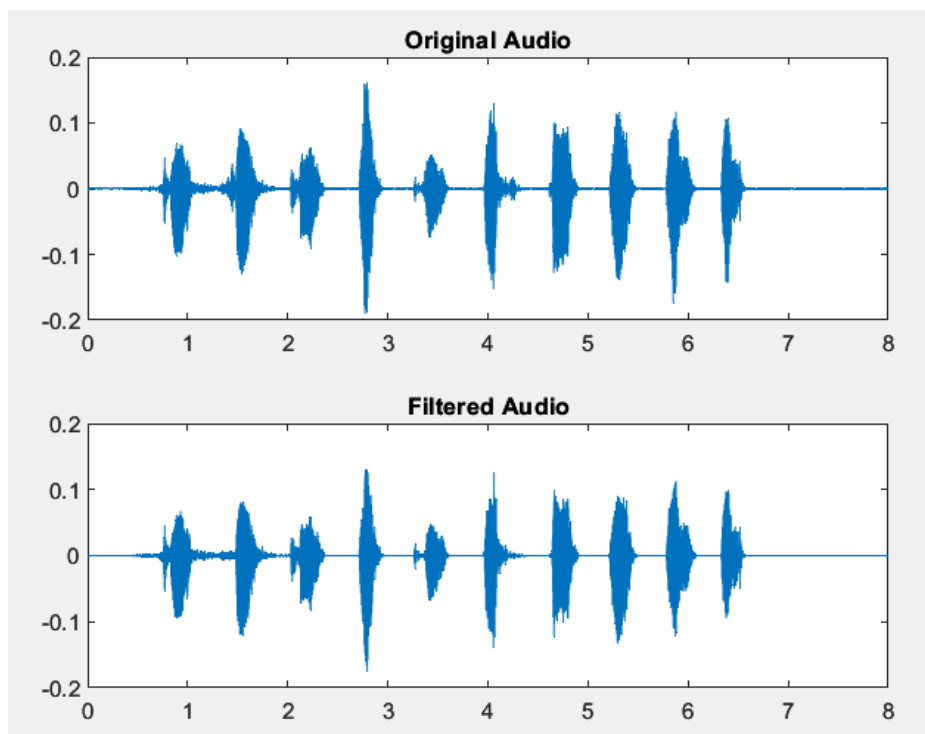
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz

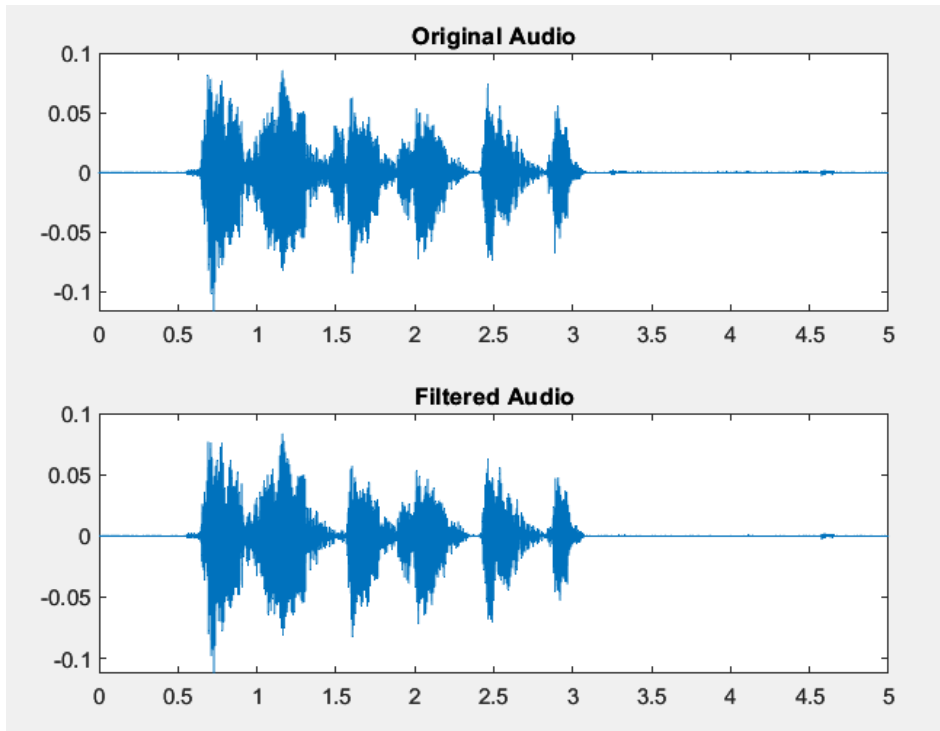


- Sampling frequency: 16000 Hz

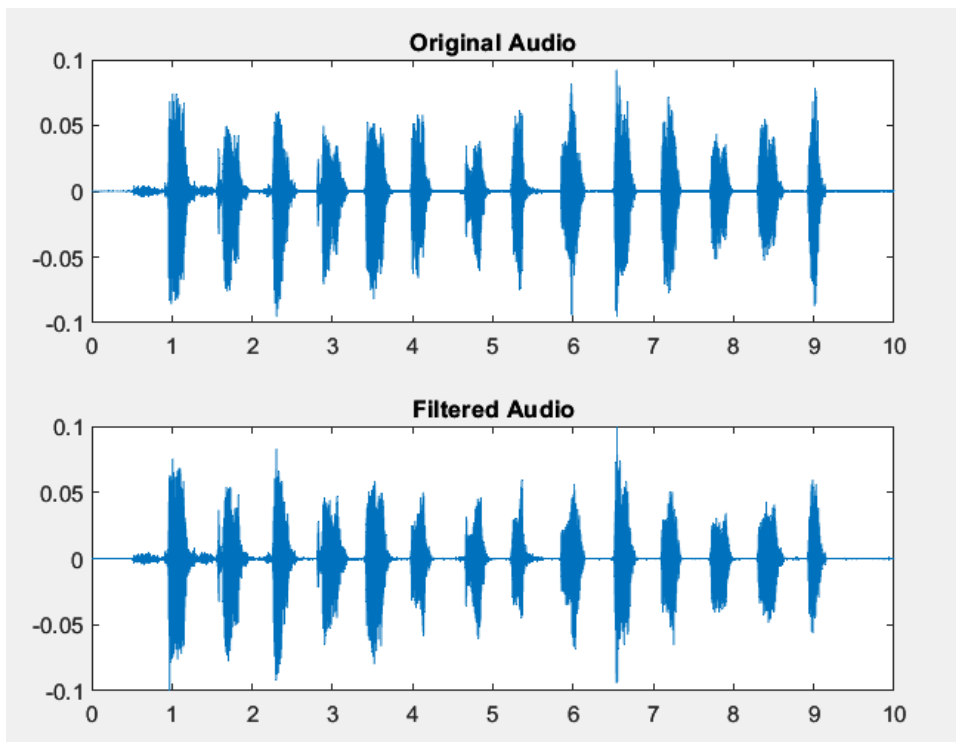


Sentence:- 4

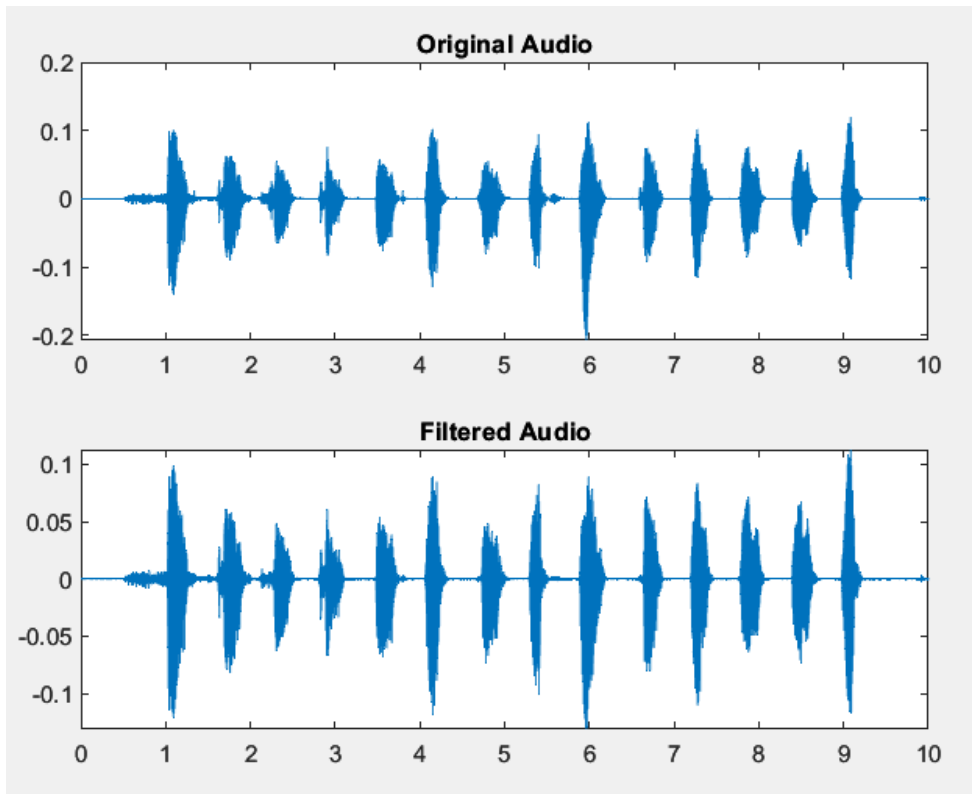
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz



- Sampling frequency: 16000 Hz



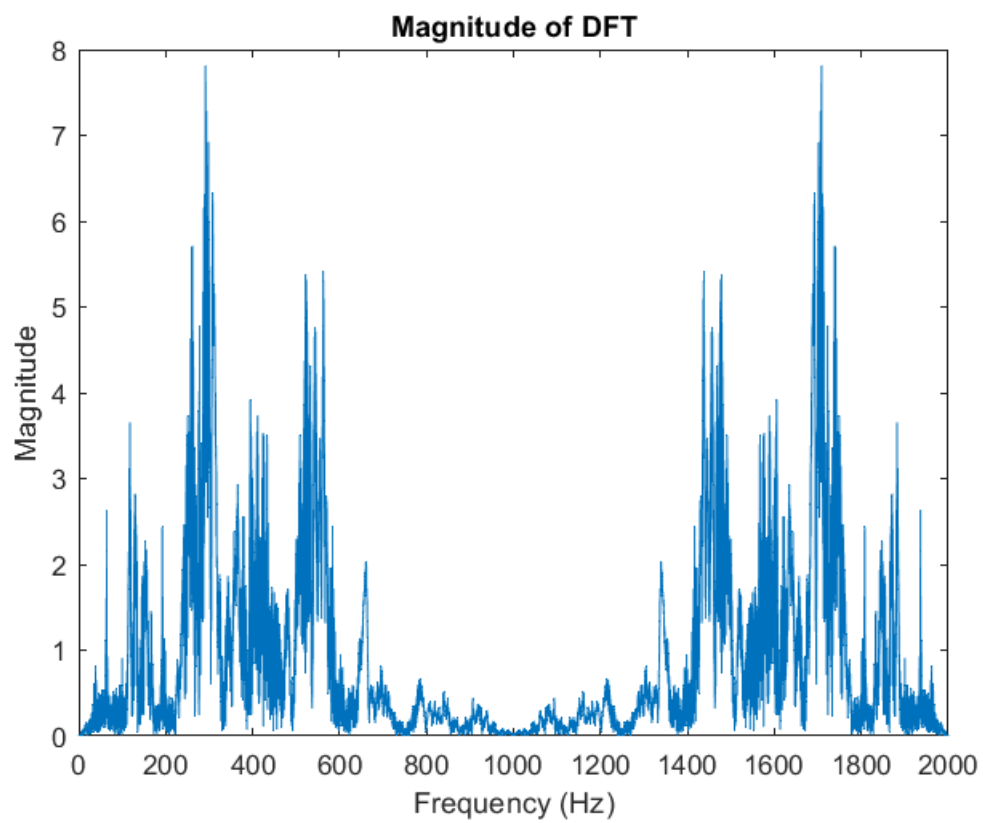
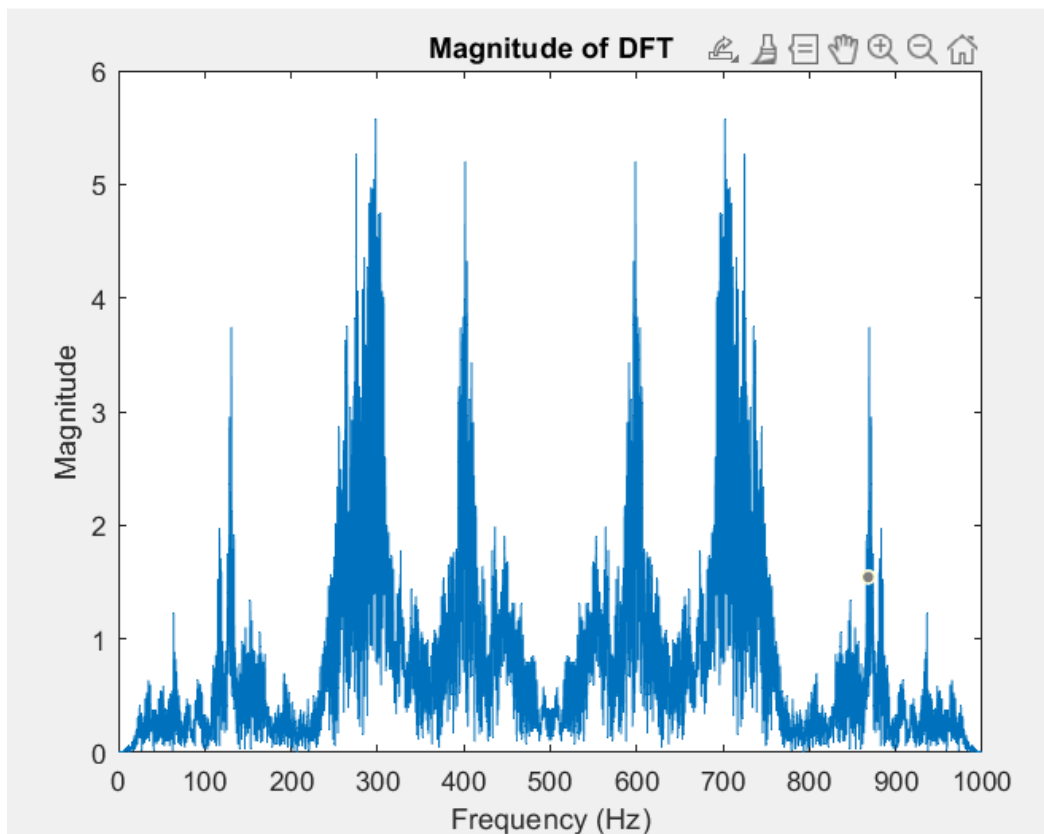
- Mayank Raj:-

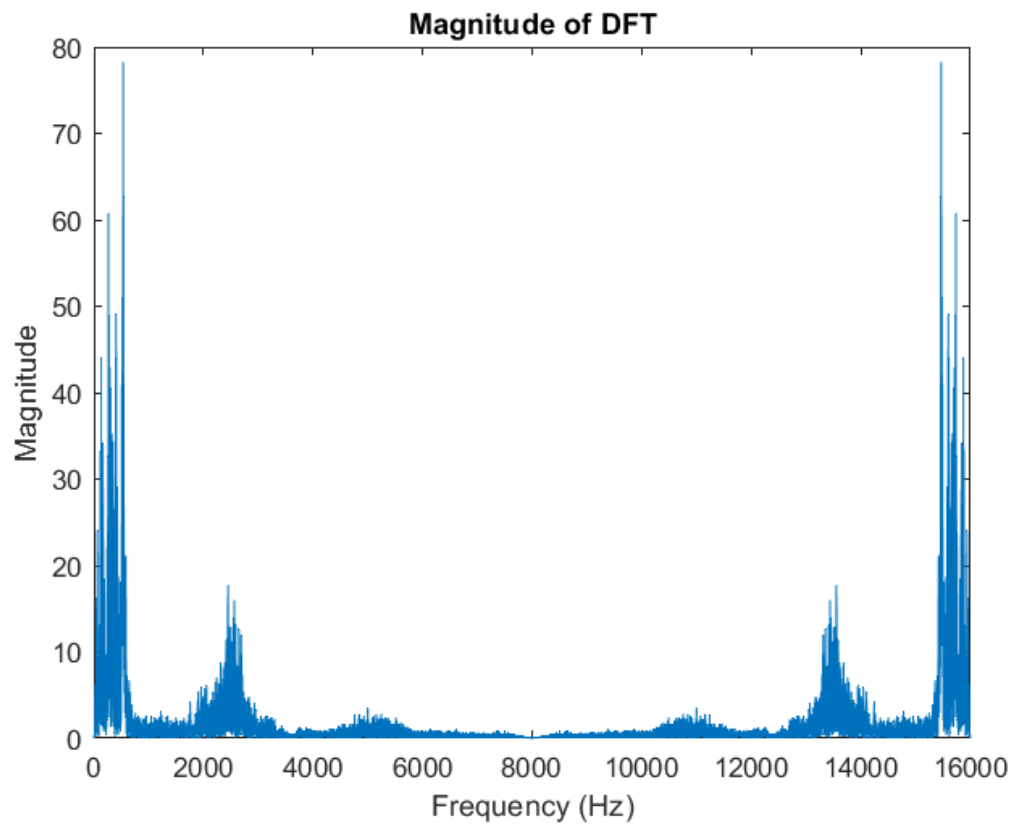
Frequencies present in audio signals:-

	1000(Hz)	2000(Hz)	16000(Hz)
Sentence: 1	297.8	291.6	532.8
Sentence: 2	378.40	117.4	377.8
Sentence: 3	261.12	118.12	397.50
Sentence: 4	118.2	117.10	117.20

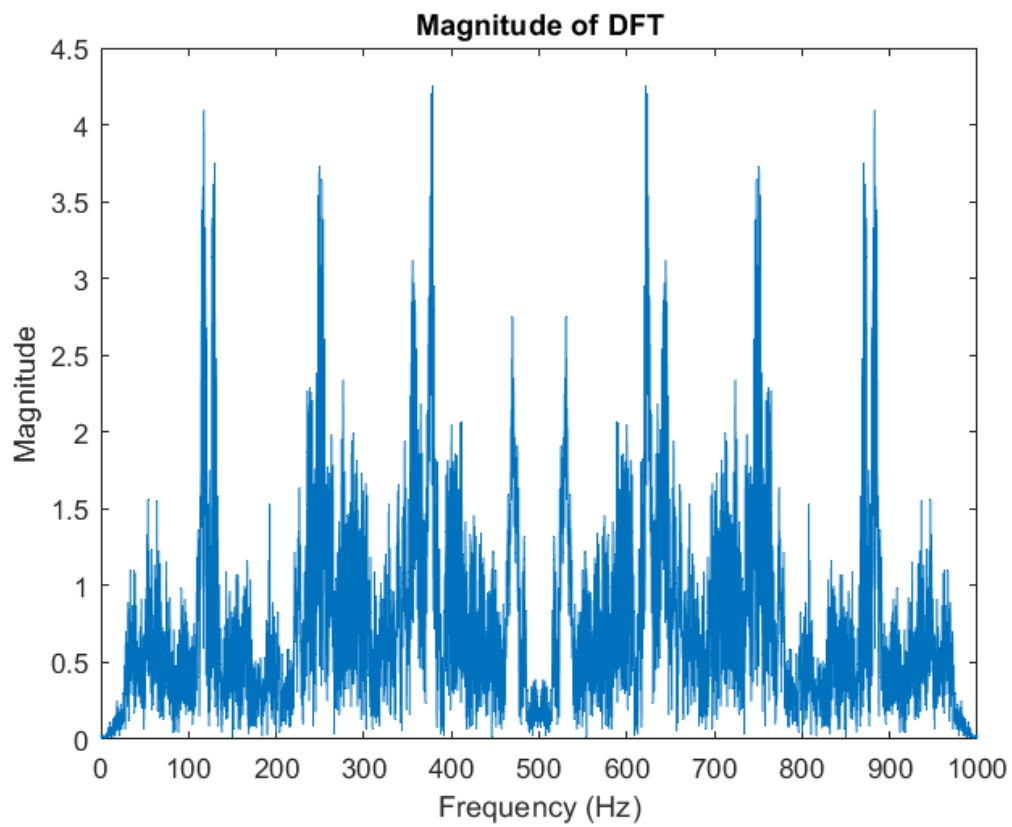
Graph between frequency and magnitude of Discrete Fourier Transform :-

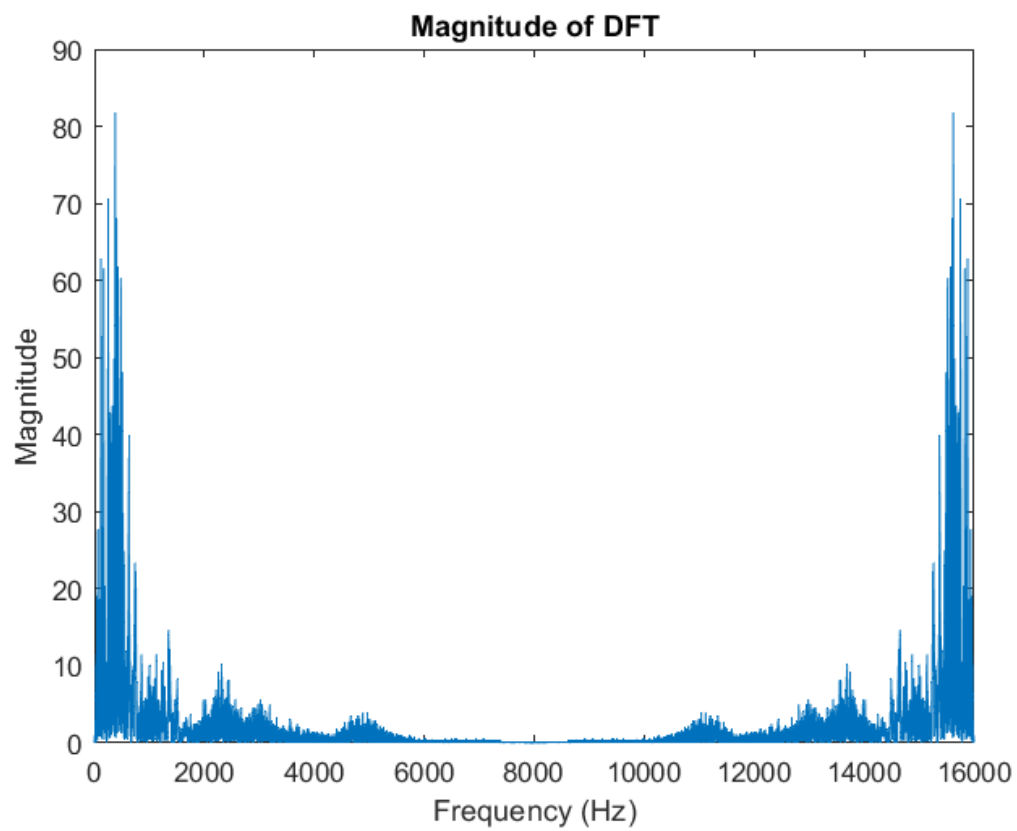
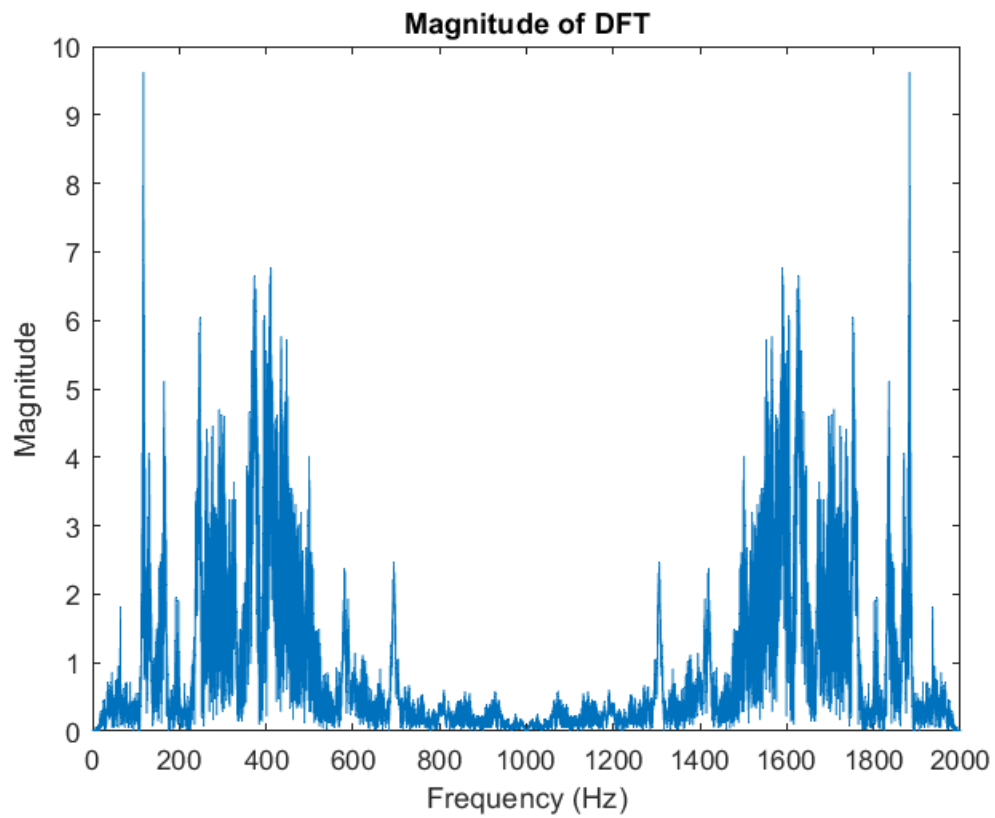
Sentence:- 1



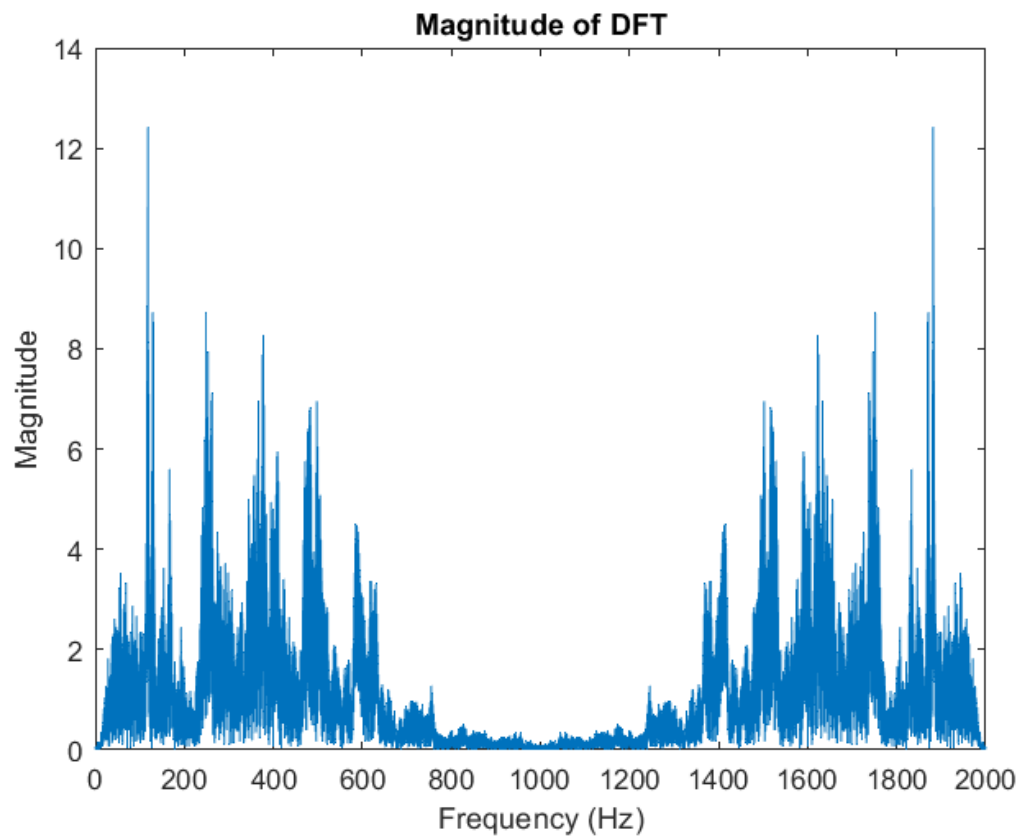
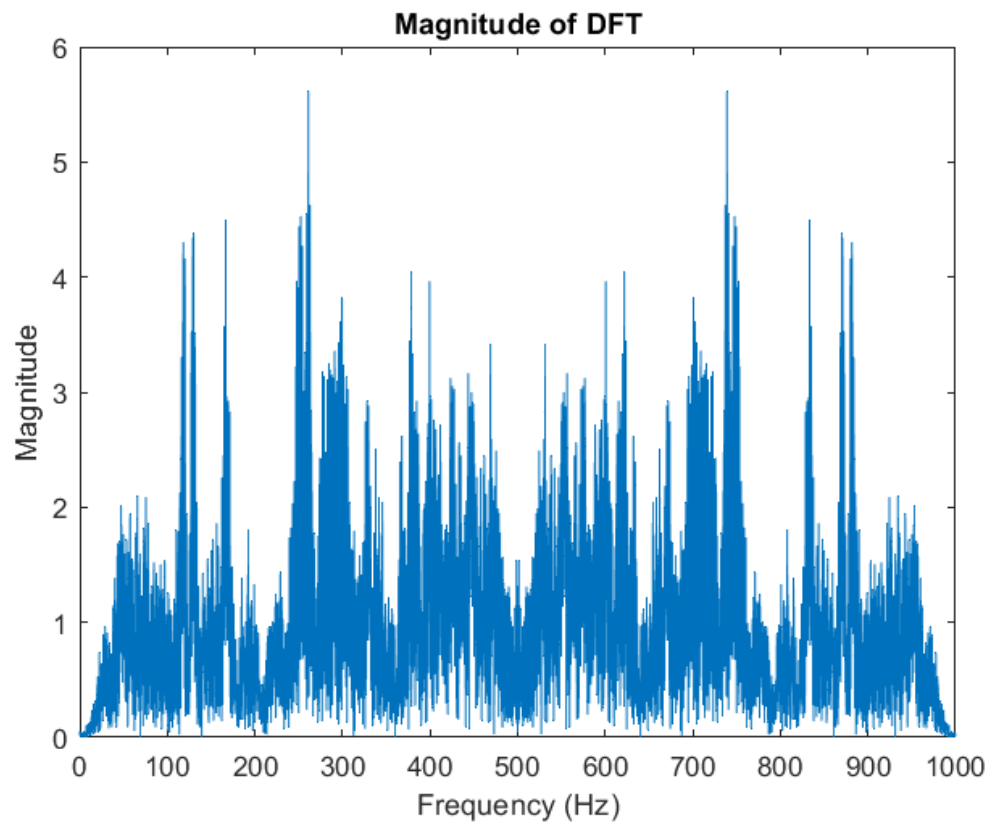


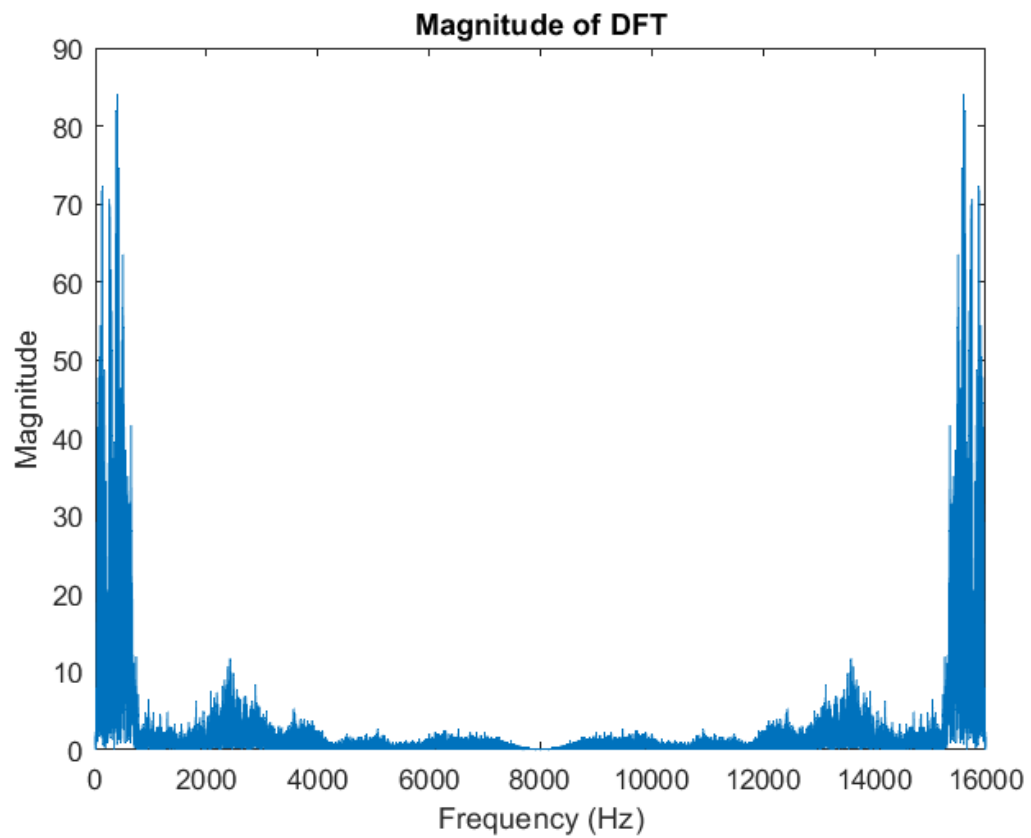
Sentence:- 2



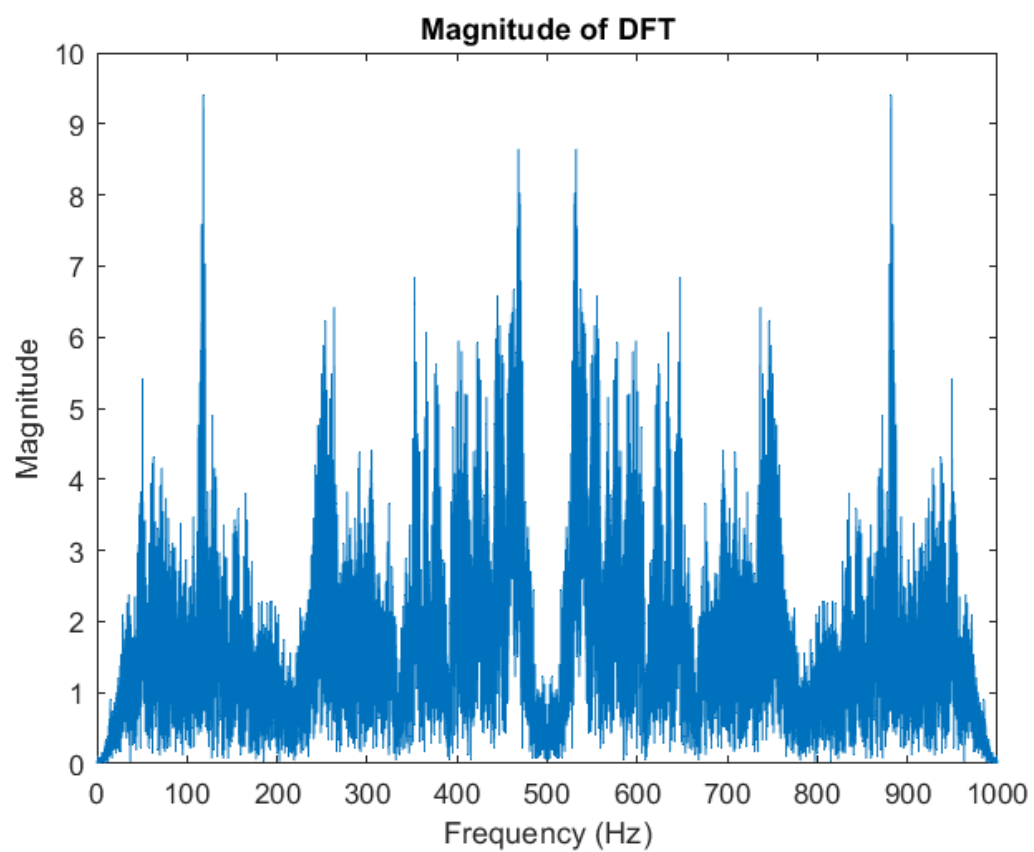


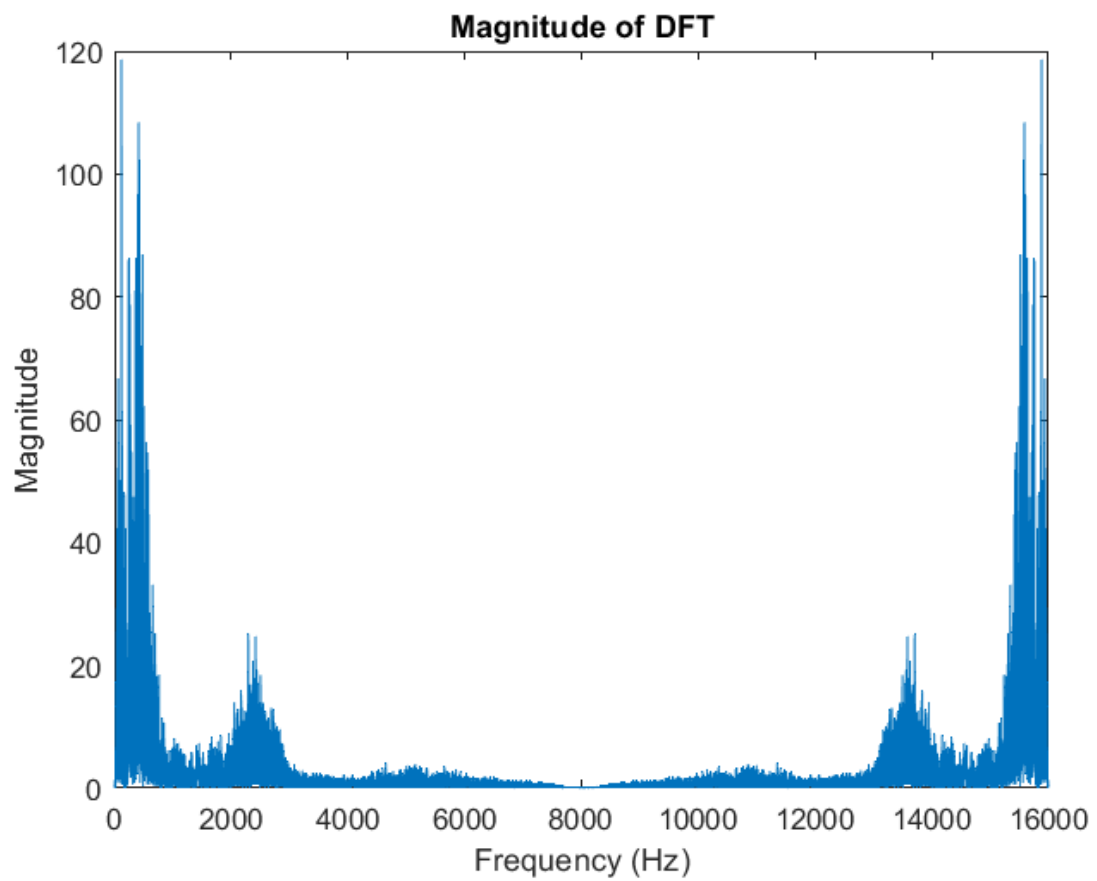
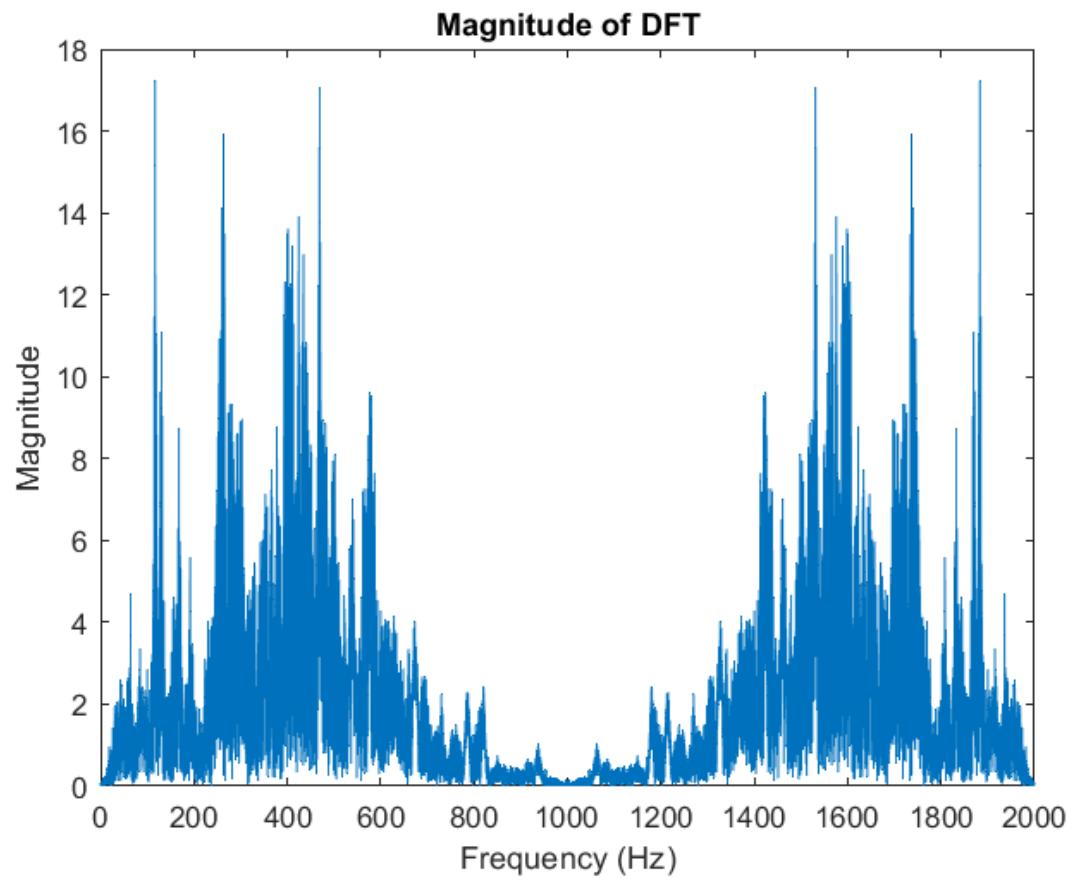
Sentence:- 3





Sentence:- 4

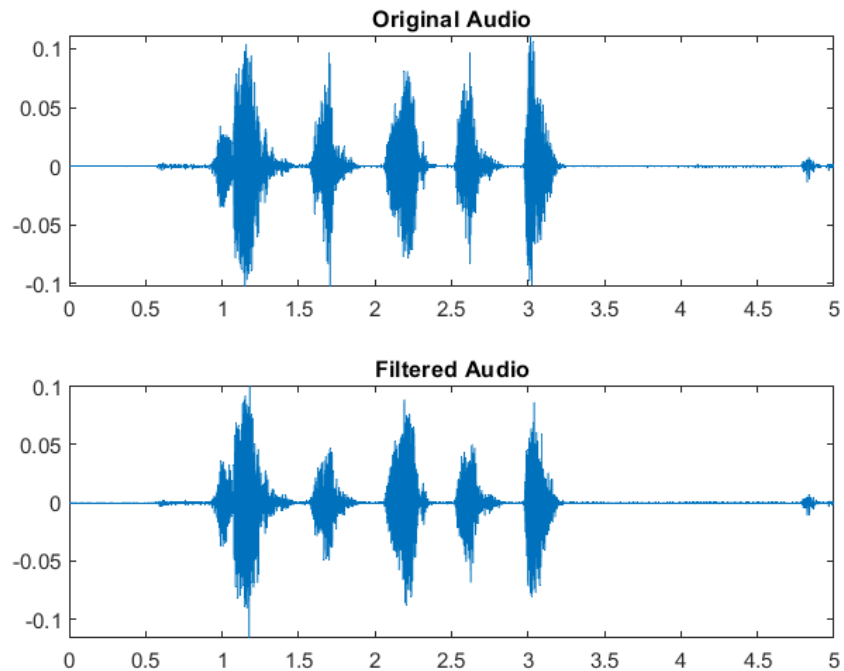




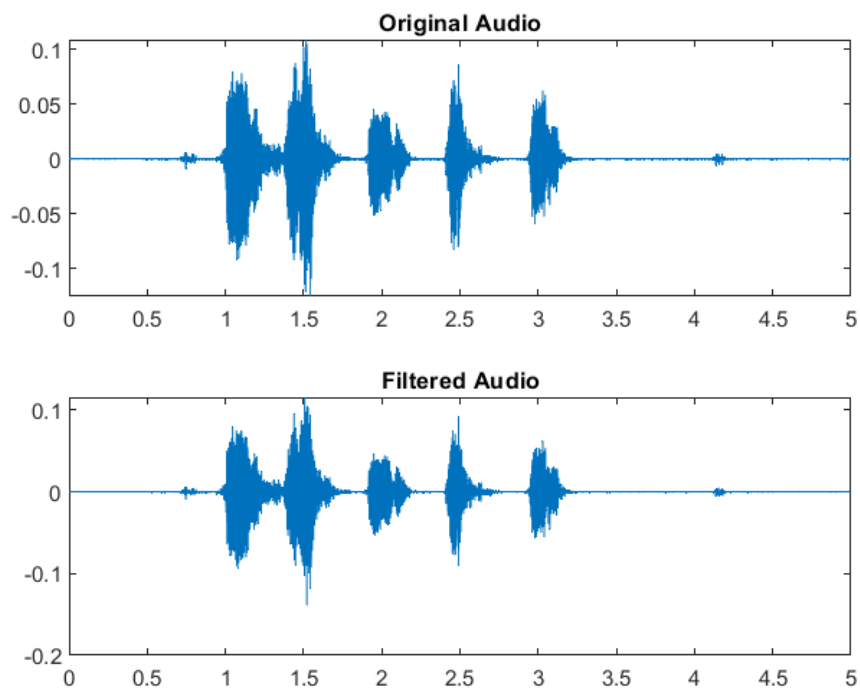
Graph of Original audio and Filtered audio:-

Sentence:- 1

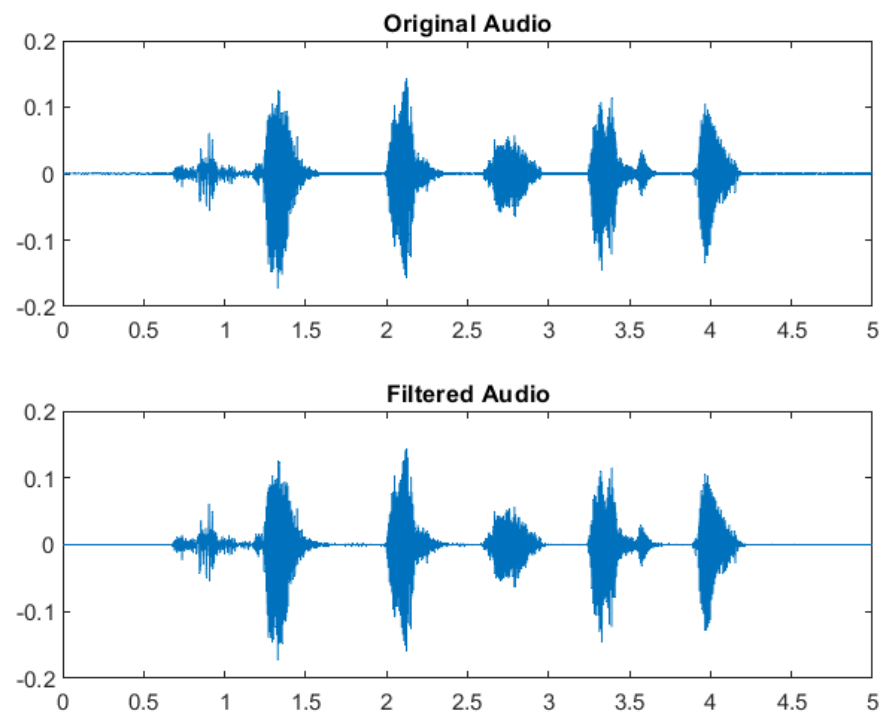
- Sampling frequency: 1000 Hz



- Sampling frequency : 2000 Hz

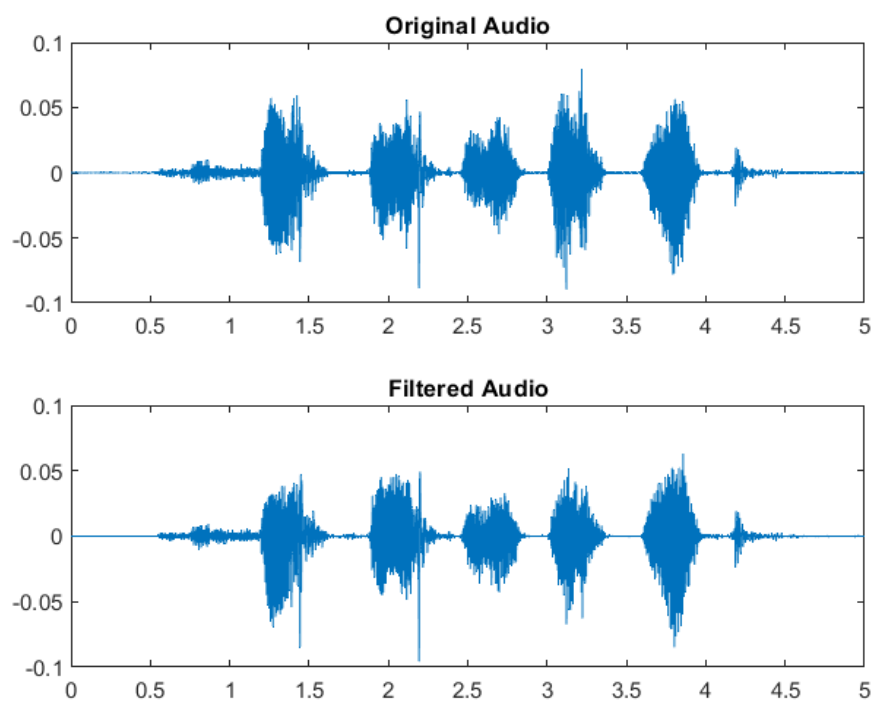


- Sampling frequency: 16000 Hz

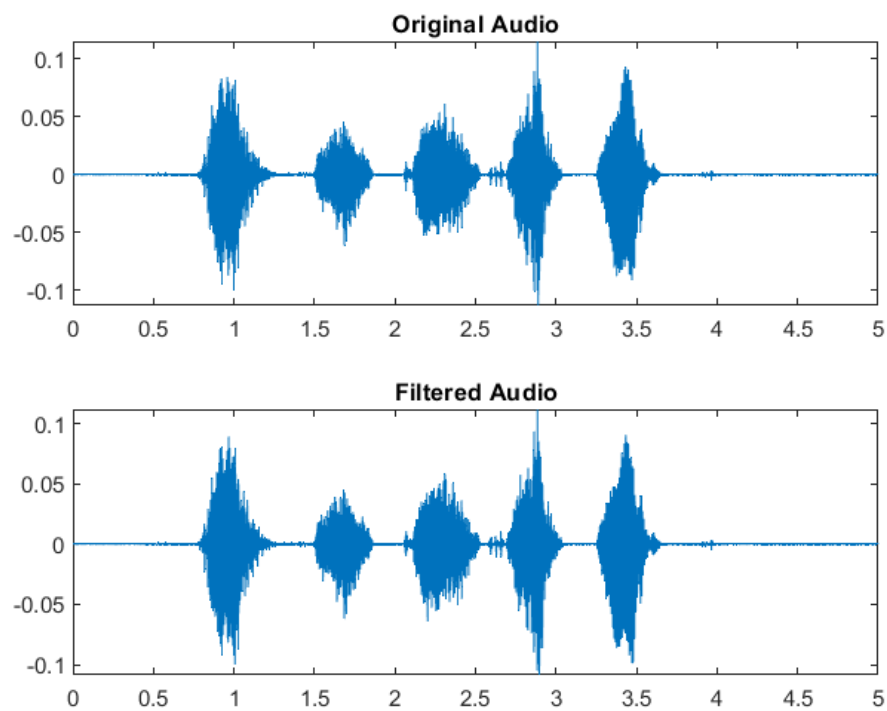


Sentence: - 2

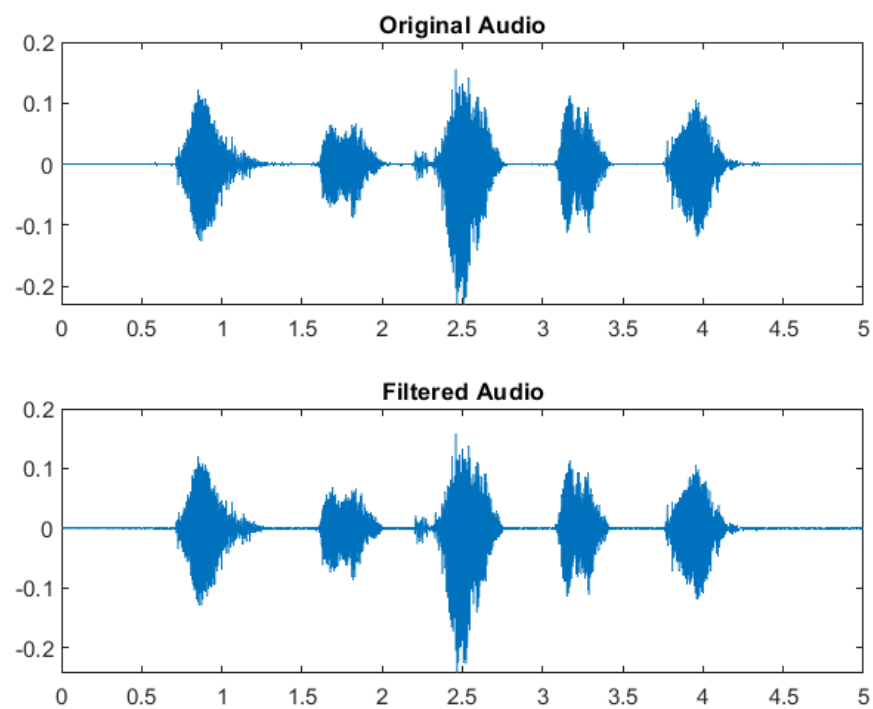
- Sampling frequency: 1000 Hz



- Sampling frequency: 2000 Hz

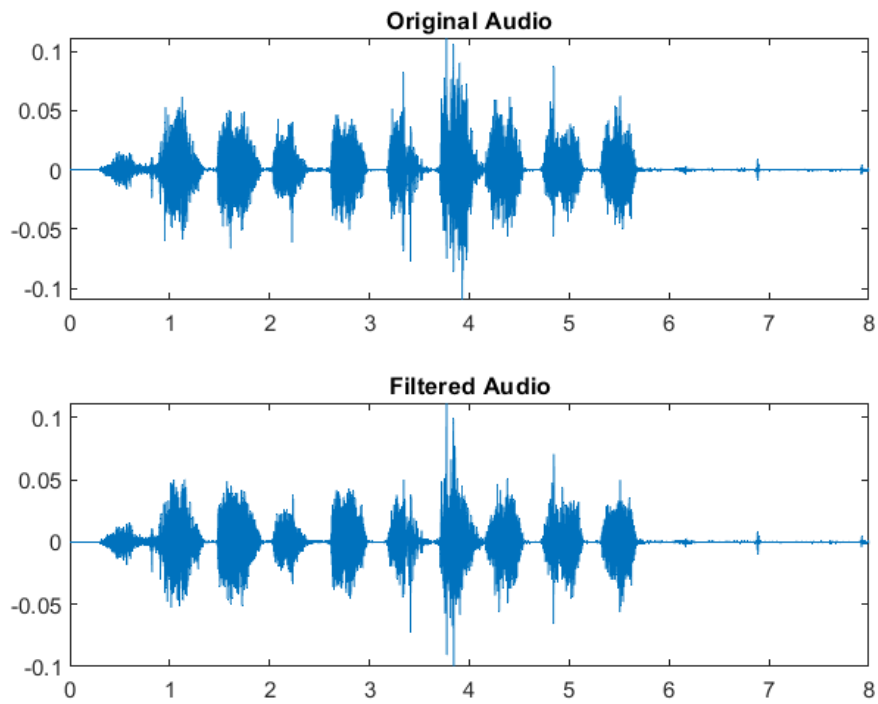


- Sampling frequency: 16000 Hz

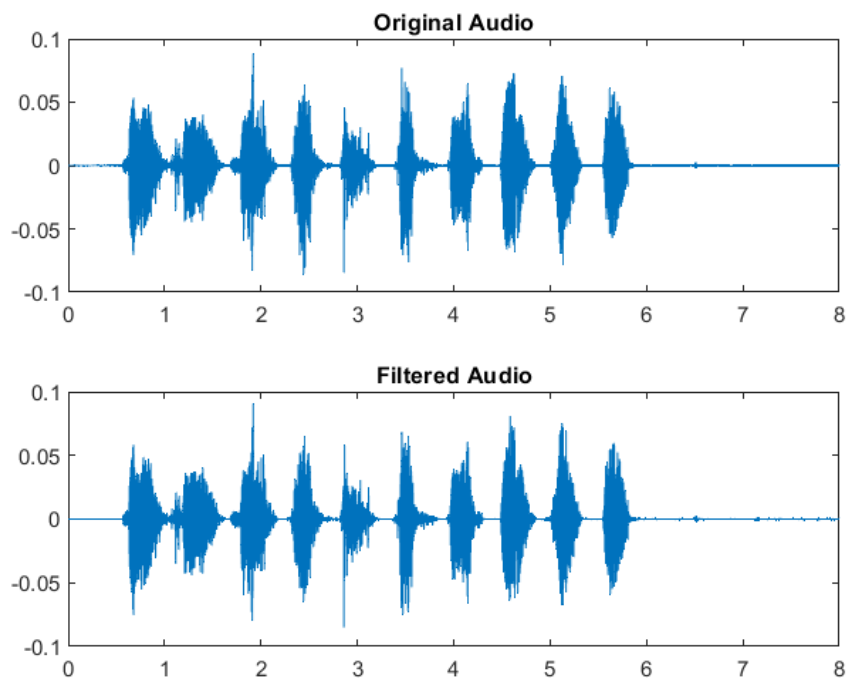


Sentence: - 3

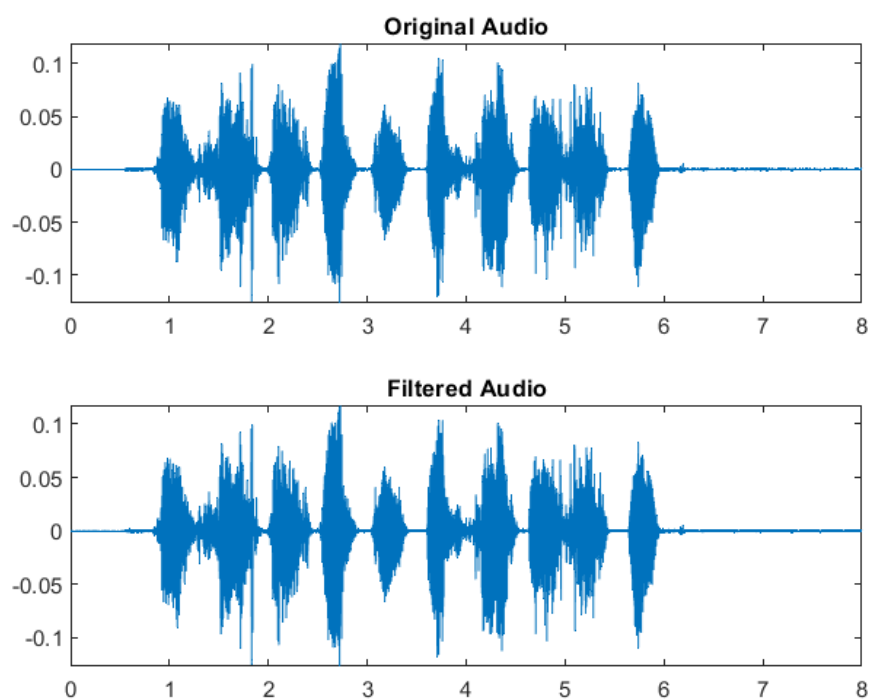
- Sampling frequency : 1000 Hz



- Sampling frequency : 2000 Hz

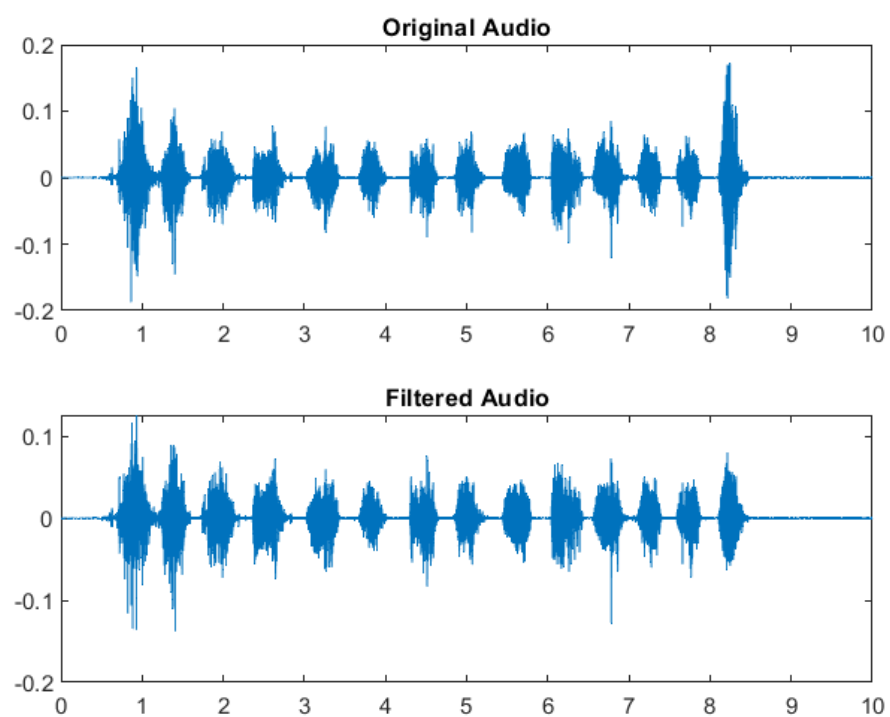


- Sampling frequency: 16000 Hz

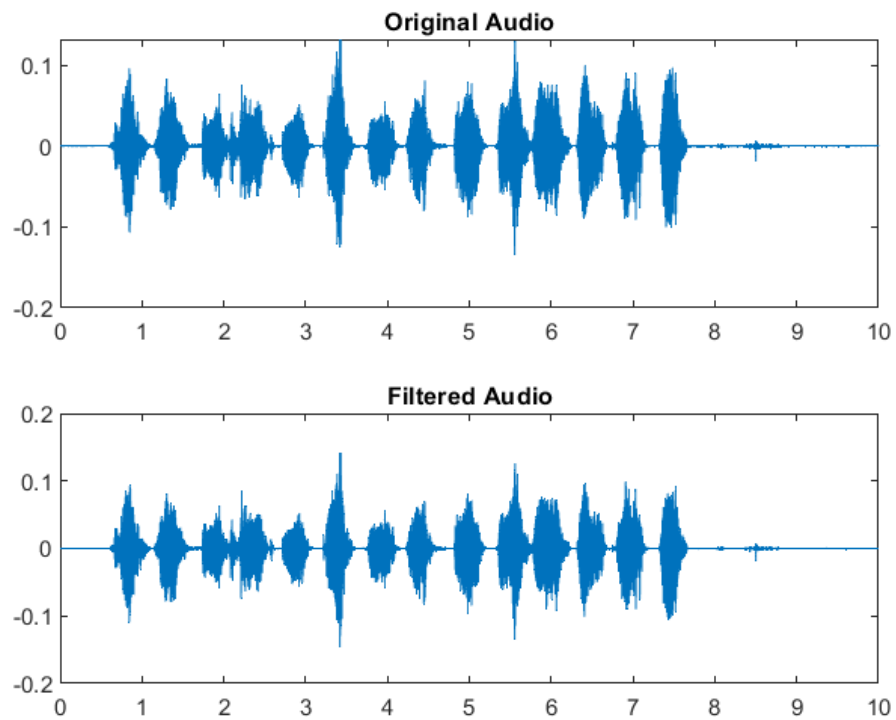


Sentence: 4

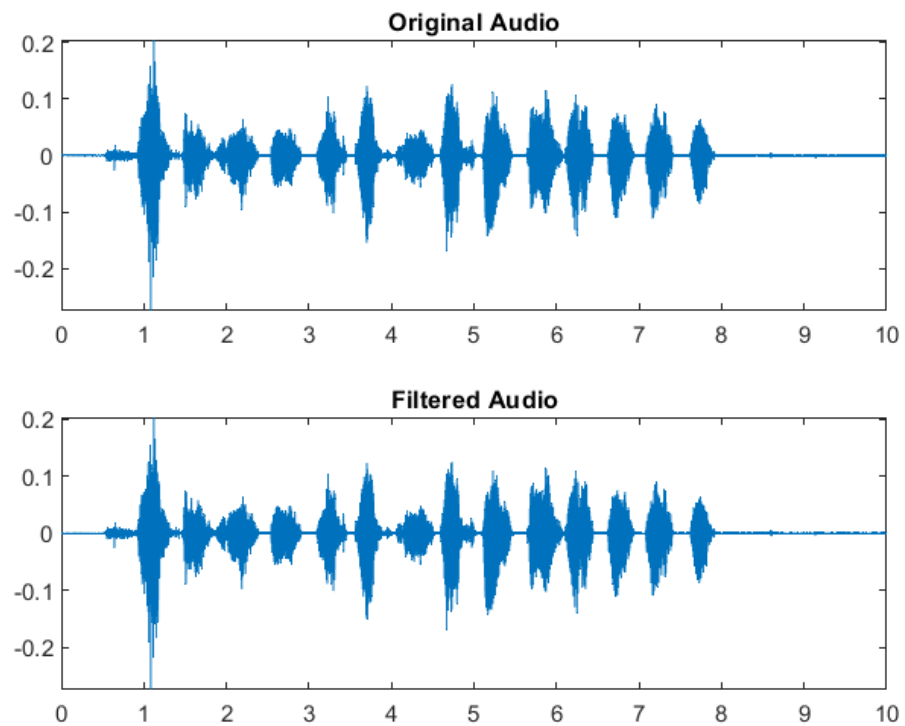
- Sampling frequency: 1000 Hz



- Sampling frequency : 2000 Hz



- Sampling frequency : 16000 Hz



Comments on frequency vary across the sampling frequency:-

Observing the frequency of Mota Ram we can see that as sampling frequency is increasing the frequency of signal is decreasing. Across the sentences there is no common trend that is following, frequency is varying randomly across sentences.

Mota Ram's frequency is low as compared to Mayank Raj and Prince.

Frequency of Mayank and Prince is mostly similar.

Frequency is low at 1000 Hz then decreases at 2000 Hz again increases at 16000 Hz in a sentence for both Mayank and Prince.

Contribution of each group member:-

Mota Ram :- audio recording code

Prince Kumar Jain:- DFT and frequency code

Mayank Raj :- Noise cancellation code

After writing code each member recorded their audio and found DFT, frequency and filtered signal and mentioned in report.

In short we can say that each member contributed 33%.