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TCIT
Section A

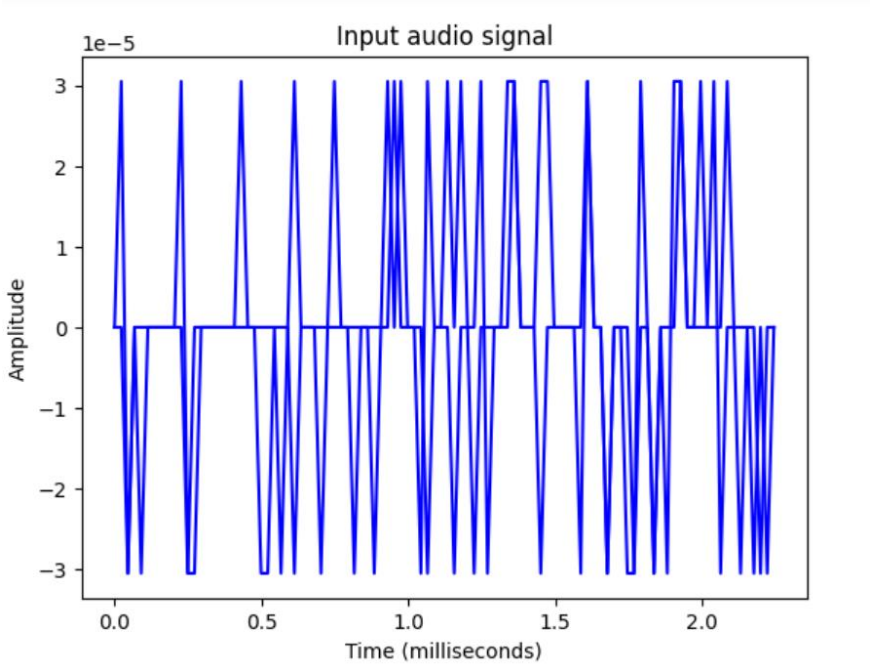
AI&ES LAB #6

TASK 1: Generate the output for the above code.

Code:

```
import numpy as np
import matplotlib.pyplot as plt
from scipy.io import wavfile
frequency_sampling, audio_signal=wavfile.read("C:\\Users\\Work-
pc\\Downloads\\harvard.wav")
print('Signal shape:',audio_signal.shape)
print('Signal Datatype:',audio_signal.dtype)
print('Signal
Duration:',round(audio_signal.shape[0]/float(frequency_sampling),2),
'seconds')
audio_signal=audio_signal/np.power(2,15)
audio_signal=audio_signal[:100]
time_axis=1000*np.arange(0,
len(audio_signal),1)/float(frequency_sampling)
plt.plot(time_axis, audio_signal, color='blue')
plt.xlabel('Time (milliseconds)')
plt.ylabel('Amplitude')
plt.title('Input audio signal')
plt.show()
```

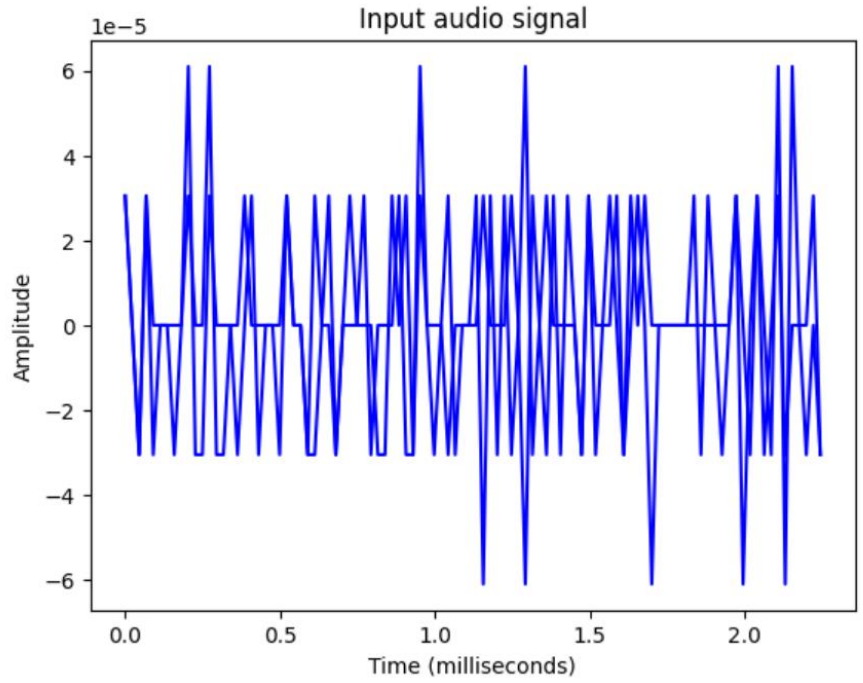
```
Signal shape: (809508, 2)
Signal Datatype: int16
Signal Duration: 18.36 seconds
```



TASK 2: Generate the output for other audio files as well and see the difference.

Output for car audio:

```
Signal shape: (1398528, 2)
Signal Datatype: int16
Signal Duration: 31.71 seconds
```



EXERCISE:

1. **How did different accents or languages impact the transcription process?**
   It worked alright for me accent-wise. I tried it in both English and Urdu and it detected both correctly.

2. **Did background noise affect the accuracy of speech recognition? If so, how?**
   Background noise didn't affect the accuracy at all for me. All my input audios were accurately transcribed.

3. **How did the speech recognition system perform when presented with different audio files (e.g., "Eagle" vs. "Elephant")?**
   The frequencies of different audio files, especially of different animals, would differ greatly so the accuracy may not always be 100%.

4. **What differences were observed in recognition accuracy when recording voices with different characteristics (e.g., "shrill" vs. "grave")?**
   Again, since shrill voices have a higher frequency as compared to grave voices, there could be a difference in accuracy. However, it transcribed all my audio files perfectly.

5. **Introduce yourself and recognized it in spoken word. Analyze the background noise affect.**

```
import speech_recognition as sr
recording = sr.Recognizer()
with sr.Microphone() as source:
    recording.adjust_for_ambient_noise(source)
    print("Please Say something:")
    audio = recording.listen(source)
try:
    print("You said: \n" + recording.recognize_google(audio))

except Exception as e:
    print(e)
```

```
Please Say something:
You said:
hello my name is Amna Khalid I am a 20 years old computer science undergraduate student
```

No effects of background noise.