Kod do instrukcji nr 4:

from scipy.io import wavfile

import os

import numpy as np

from scipy.fft import fft

import matplotlib.pyplot as plt

path = 'voices'

files = os.listdir(path)

fs = 16000

seconds = 3

max\_length = fs \* seconds

X\_raw = np.zeros((len(files), fs\*seconds))

for i, file in enumerate(files):

    file\_path = os.path.join("voices", file)

    sample\_rate, data = wavfile.read(file\_path)

    X\_raw[i, :len(data)] = data[:max\_length]

X\_fft = np.abs(fft(X\_raw, axis=-1))/X\_raw.shape[1]

low\_cut = int(50\*seconds)

high\_cut = int(280\*seconds)

X\_fft\_cut = X\_fft[:, low\_cut:high\_cut]

fig, ax = plt.subplots(2, 1)

ax[0].plot(np.arange(max\_length), X\_raw[0, :])

ax[1].scatter(np.arange(low\_cut, high\_cut), X\_fft\_cut[0, :], s=0.5)

fig.tight\_layout()

plt.show()