Report

The code will run according to the following steps

1. At the beginning **numPy, matplotlib.pyplot and soundevice** modules are imported. **NumPy** module will be used to generate our t-axis (Time axis) and will be used also to store the different frequencies (tones) of our song . **matplotlib.pyplot** will be used to plot our continuous final signal (Song). **Sounddevice** module will be used to generate the sound by using the generated signal.
2. We start by define t axis(Time axis) form 0s to 3 and divide the axis into 12*1024 divisions using the function linspase which is defined in numpy module.
3. Then we store the different frequencies (different tones) = 9 frequencies in an array (frec array)
4. After that we start by initialize our signal (x) by 0 and then initialize (ti) by zero which represents the the start of each tone and then initialize (tf) by 0.33 which represents the time at which the tone will stop.

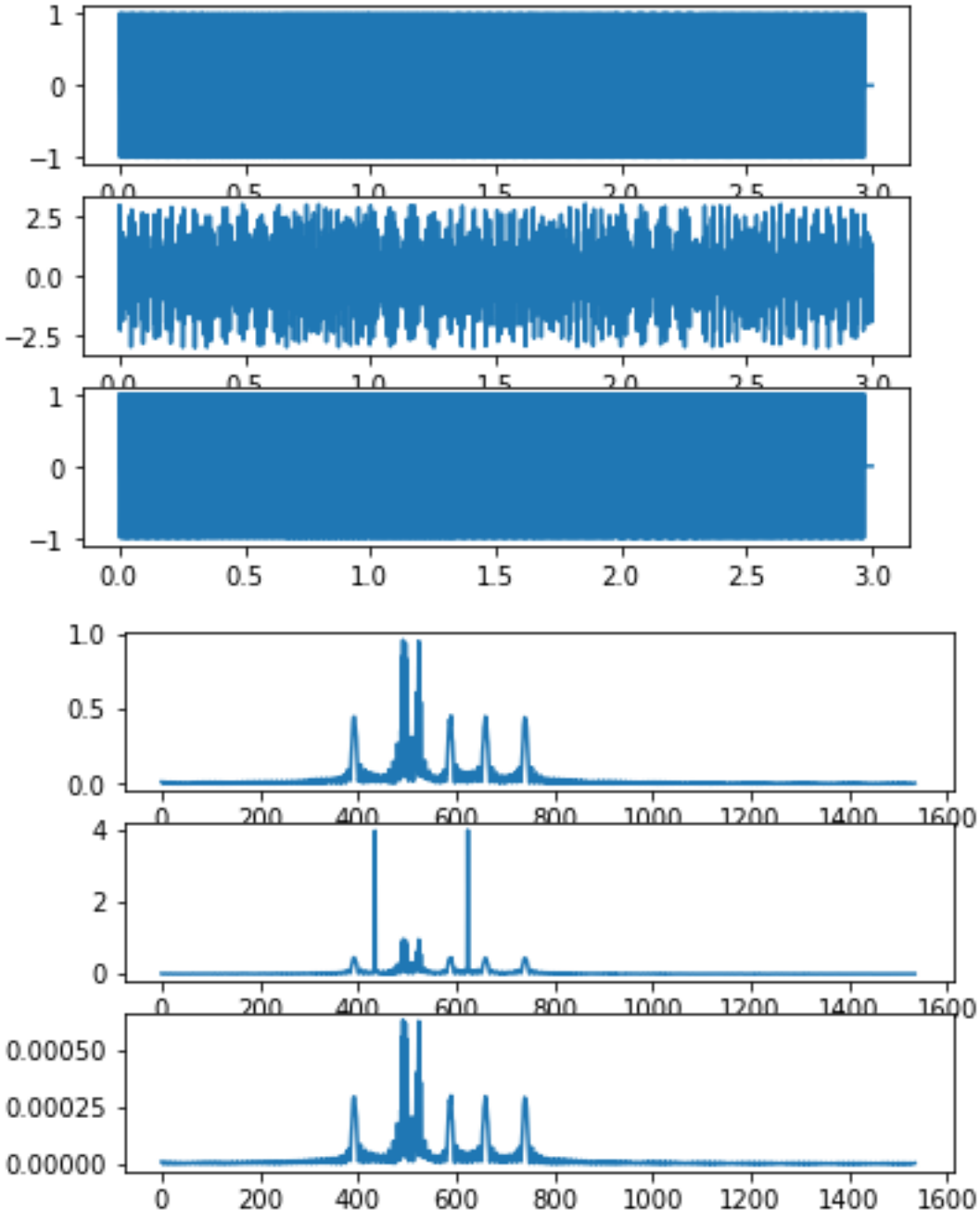
5. We start by looping on the frec array and in each iteration, we generate a new tone(frequency) using reshape method which is defined in numpay module in a speficifc interval from which is the interval at which t>=ti and t<=tf and then accumulate the tone to the final signal (x) and then increment the (ti) and (tf) by 0.33, hence each tone will have the duration 0.33 the only different will the the initial time the the final time of the tone.

6. Finally, draw the final song (x) using plot function which is defined in matplotlib.pyplot, then generate the sound using play function which is defined in sounddevice module.

Milestone 2

- At the beginning a two different random frequencies are created and then add them to the original signal to create a signal with noise
- Then we get the Fourier transform for the signal with noise so that we can search and find the frequencies for the noise after that we extract the highest two frequencies from the signal using find_peaks function.
- Finally the highest two frequencies are removed from the signal which contain noise ,and then we will have a new signal which is similar to the original signals which means that we removed the noise from the signal

Photo for the generated signals



Students Names:

Mohamed Hassan Samy Abdelafttah ID:52-21601

Omar Wael Mohamed Ramy ID:52-21187

Tutorial :T-8