Assignment 1. Modeling voice via sinusoidal modeling

Submission deadline: Sunday, 5 February 2023, 23:59

Submission format:

- .ipynb file with code,
- .wav files with synthesized audio;

Grading criteria:

- code is functional, some results are achieved: +5 points,
- at least 3 different basic signals are used (For example sinusoidal, quadratic, and sawtooth): +2 points,
- no audio references for single letters, you use only one audio reference for the full word: +2 points,
- well commented and structured code: +1 points;

Task

In this assignment, you will have to use basic signals for voice synthesis. The word you have to model is your first name. If the full version of your first name is 7 letters or more, you can use the short version of your name.

Example: *Instead of "Tatyana" you are allowed to model "Tanya".*

The assignment consists of two parts. In the first part, you have to synthesize audio for each letter separately.

Example: *Your word is "Tanya". For part one, you submit 5 audio .wav files for letters "T", "a", "n", "y" and "a"* separately.

In part two you will have to "glue" your audio files as one to synthesize the whole word. Your job here is to smoother transitions between different signals. Your submission will consist of a .ipynb file with code, one .wav file for each letter in your word, and one .wav file for the whole word.

Example: *Your word is "Tanya". You submit 1 .ipynb file and 6 .wav files.*

Constraints:

- No machine learning, except for linear regression, logistic regression, or polynomial regression,
- No Inverse Fourier Transformation applied to the original spectrum;

References:

- https://github.com/AllenDowney/ThinkDSP
- https://ieeexplore.ieee.org/abstract/document/599668
- https://ieeexplore.ieee.org/abstract/document/1660161
- https://greenteapress.com/thinkdsp/html/index.html

P.S. If some parts of the assignment need to be clarified, feel free to contact me via our chat.