

ShS - Homework 2

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2.1 Generating a sound

The sound becomes inaudible in-between 17000 and 17500 Hz.

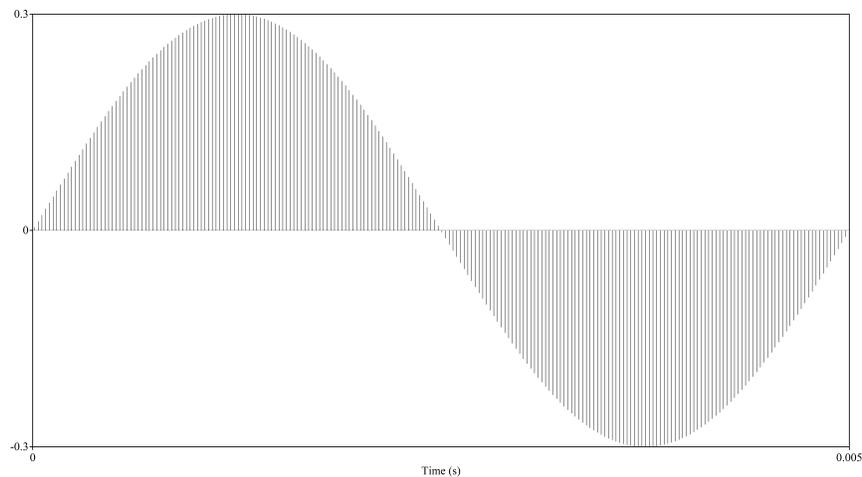
2.2 Amplitude

Changing this number will change the distance between the peaks and the equilibrium position of the sound wave. Increasing this number will increase this distance and vice versa. The increased distance will result in higher peaks in the sound window and a louder tone when listening to the sound. Decreasing the amplitude will have the adverse effect.

2.3 A nasty effect

All sample values above 1 will be set to 1. This effect is called clipping.

2.4 Samples



2.5 Aliasing

43500 Hz with a sampling rate of 44100 Hz results in a tone with a pitch of 600 Hz and 45000 Hz results in a tone with a pitch of 900 Hz. The drawn wave forms show waves with frequencies of 600 and 900 Hz. This is the result sampling the frequencies with a sampling rate which is too low. The wave is still sampled but not often enough to record the true frequency (i.e. at least twice per wave), which results in a phantom frequency.

2.6 Your first program that generates sounds

```
note ["c"] = 261.63
note ["d"] = 293.66
note ["e"] = 329.63
note ["f"] = 349.23
note ["g"] = 392.00
note ["a"] = 440.00

seq# = { note ["c"], note ["d"], note ["e"], note ["c"], note ["c"]
↪  ], note ["d"], note ["e"], note ["c"], note ["e"], note
↪  ["f"], note ["g"], note ["e"], note ["f"], note ["g"],
↪  note ["g"], note ["a"], note ["g"], note ["f"], note ["e"]
↪  ], note ["c"], note ["g"], note ["a"], note ["g"], note
↪  ["f"], note ["e"], note ["c"], note ["c"], 196.00, note ["c"]
↪  ["c"], note ["c"], 196.00, note ["c"] }

for i from 1 to size (seq#)
  Create Sound as pure tone: "tone", 1, 0, 0.4, 44100, seq#
    ↪ [i], 0.2, 0.01, 0.01
  Play
  Remove
endfor
```

2.7 Your second program that generates sounds

```
from pysine import sine

n = {}
n['g3'] = 196.00
n['c'] = 261.63
n['d'] = 293.66
n['e'] = 329.63
n['f'] = 349.23
n['g'] = 392.00
n['a'] = 440.00

seq = [n["c"], n["d"], n["e"], n["c"], n["c"], n["d"], n["e"], n[
    ↪ "c"], n["e"], n["f"], n["g"], n["e"], n["f"], n["g"], n["g
    ↪ "], n["a"], n["g"], n["f"], n["e"], n["c"], n["g"], n["a"
    ↪ ], n["g"], n["f"], n["e"], n["c"], n["c"], n["g3"], n["c"
    ↪ ], n["c"], n["g3"], n["c"]]

for f in seq:
    sine(frequency=f, duration=0.5)
```