xgonce00_e

December 13, 2022
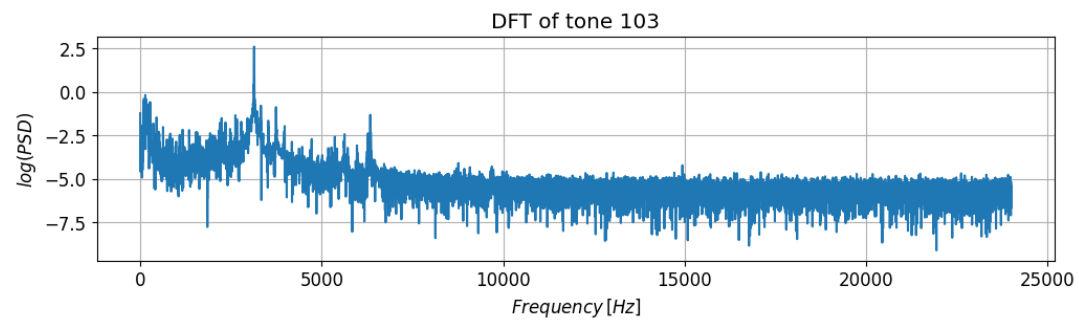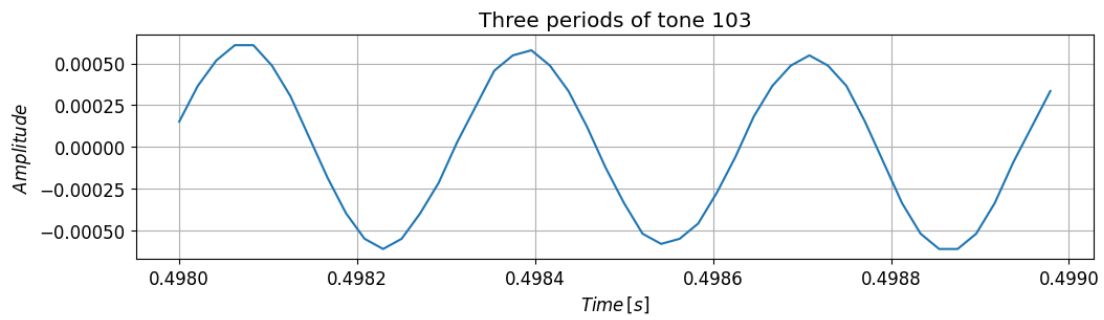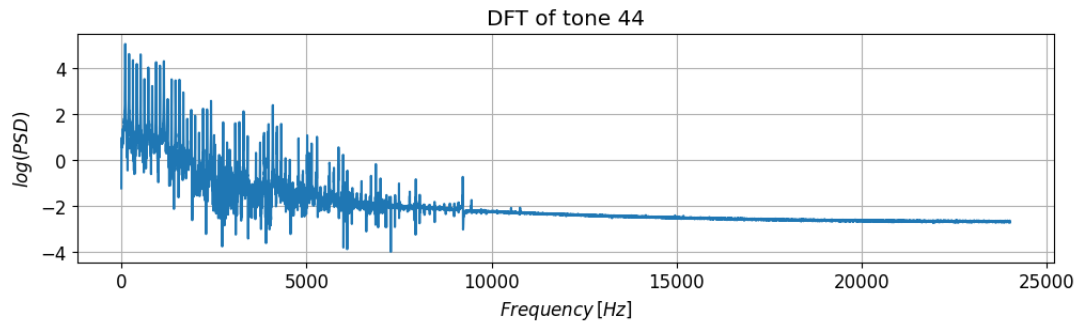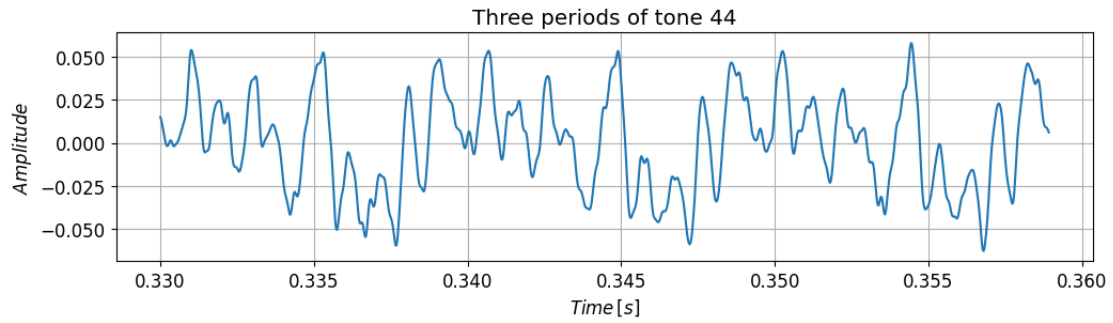
`[1]:`

```
Cell In [1], line 1
    python -m pip install nbconvert
              ^
SyntaxError: invalid syntax
```
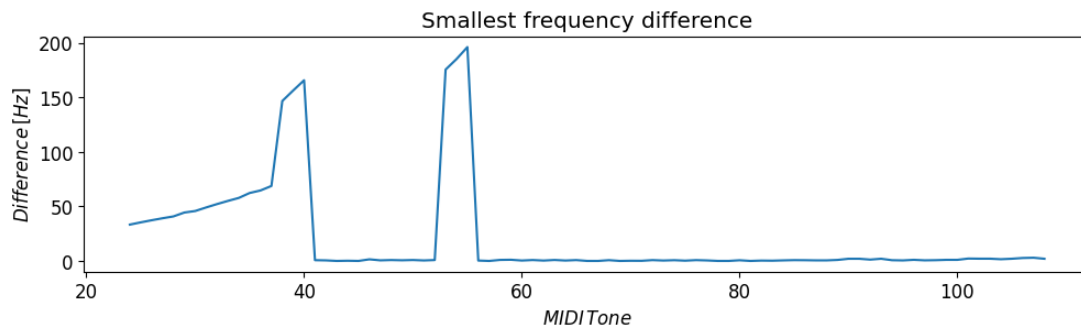
`[1]:`
```python
from task1 import task1
task1()
```

Three periods of tone 44

DFT of tone 44

Three periods of tone 103

DFT of tone 103
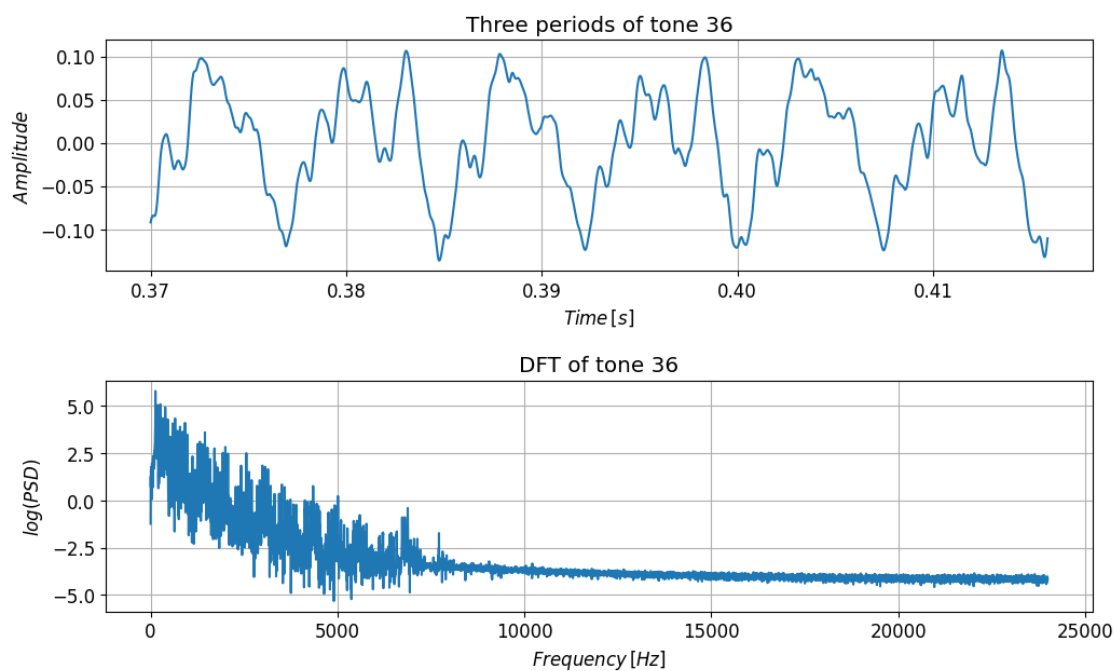
```
[1]: from task2 import task2
     task2()
```

DFT(blue) and autocorrelation(orange) difference

DFT freq. estimation vs MIDI freq.
Autocorrelation freq. estimation vs MIDI freq.

Smallest frequency difference
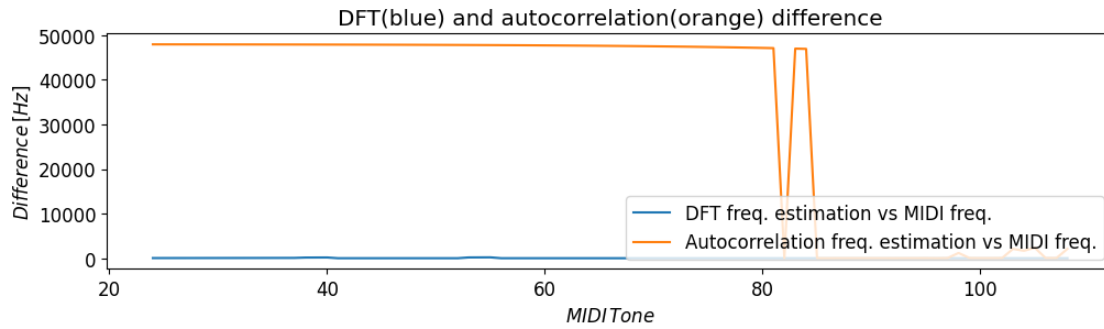
```
[3]:  from task3 import task3
      task3(200, 3, 100)
```

DTFT vs DFT/autocorr. difference

DTFT vs MIDI freq. difference

3
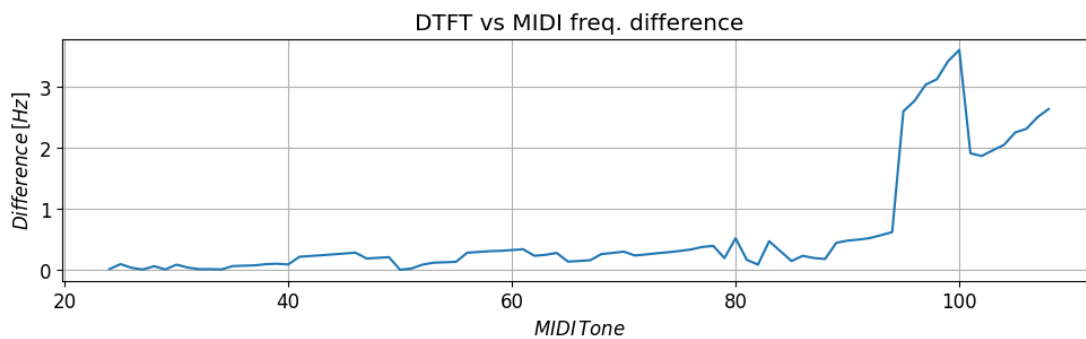
```
[2]: from task4 import task4
     task4(200, 10, 600)
```

Tone 36 harmonics on spectrum

Tone 44 harmonics on spectrum

Tone 103 harmonics on spectrum

4
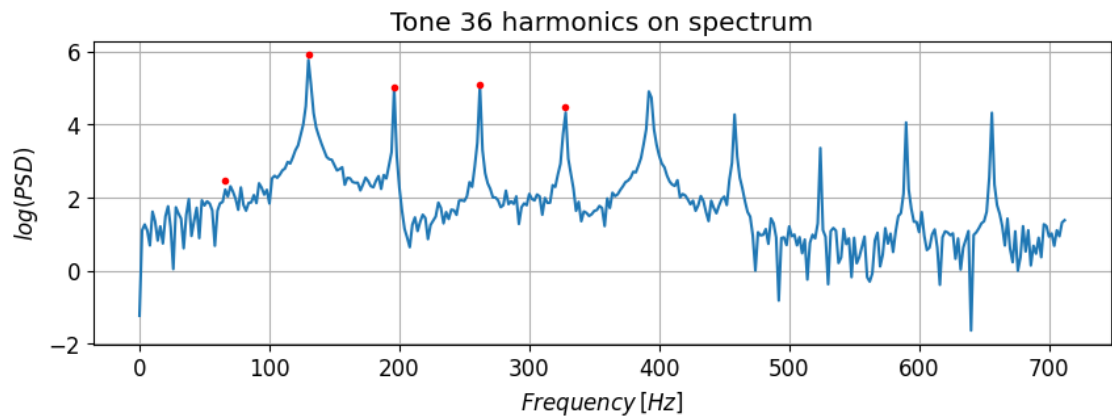
```
[1]: from task5 import task5
     task5(1, 200, 10, 200)
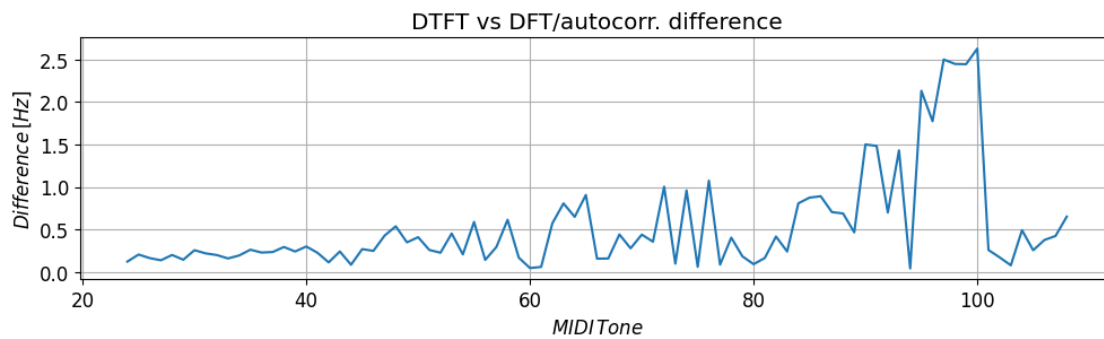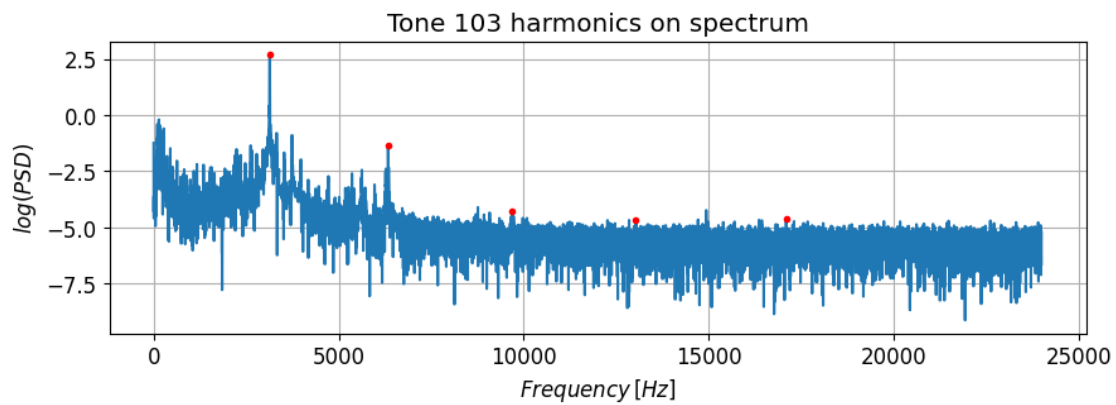```



Tone 36 original



Tone 44 original



Tone 103 original
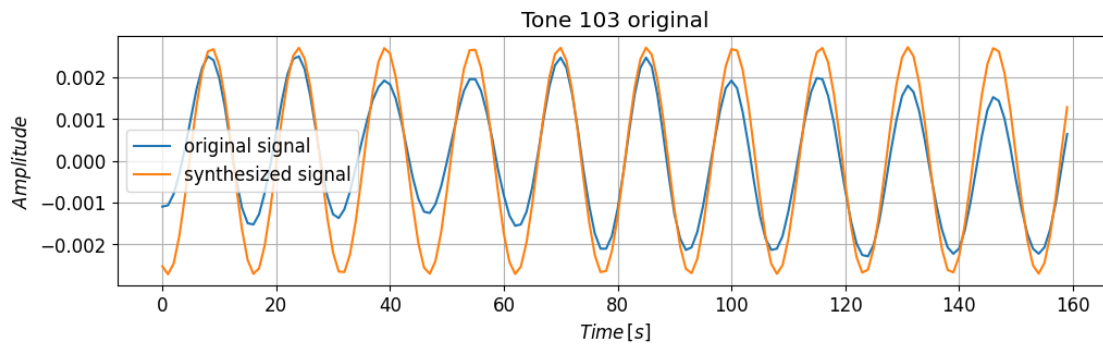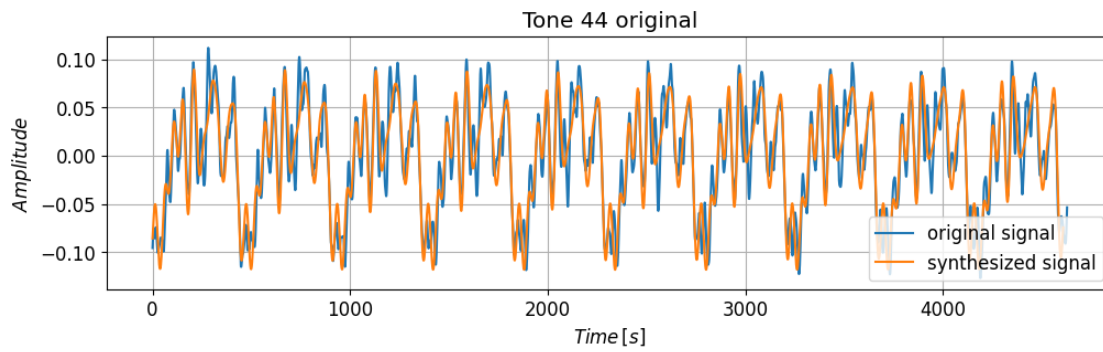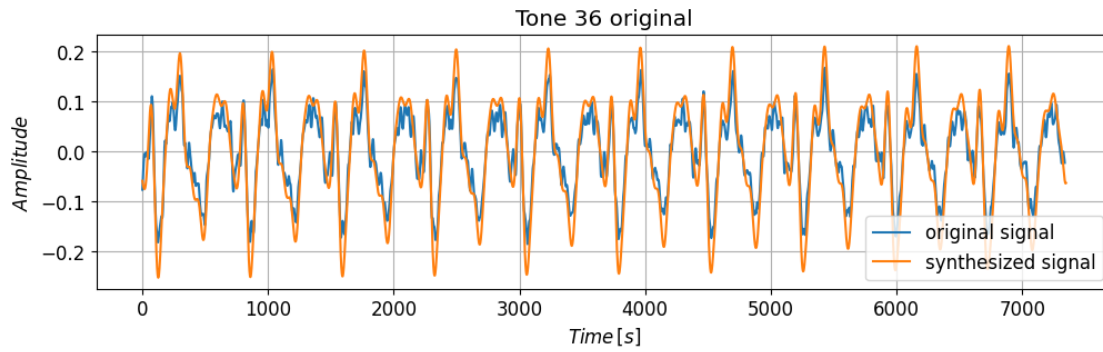
```
[6]: from task6 import task6
     task6(200, 10, 200)
```

LibsndfileError   Traceback (most recent call last)

```
Cell In [6], line 2
      1 from task6 import task6
----> 2 task6(200, 10, 200)

File d:\FIT\ISS\proj-repo\src\task6.py:42, in task6(cent, mult, dtftres)
     39 def task6(cent, mult, dtftres):
     40     tones, midif, _, _, bigN = Init()
---> 42     generate_music(cent, mult, dtftres, tones, midif, 8000 , bigN)
     43     generate_music(cent, mult, dtftres, tones, midif, 48000, bigN)

File d:\FIT\ISS\proj-repo\src\task6.py:27, in generate_music(cent, mult,
 dtftres, tones, midif, Fs, bigN)
     24 for i in range(tonefrom, toneto):
     25     freqs, mods, genx, synt[i] = generate_tone(
     26         tones[i], midif[i], maxtonelen_s, cent, mult, dtftres, Fs, bigN
---> 27     sf.write('../audio/tmp/'+str(int(Fs))+'/'+str(i)+'.wav', synt[i], F )
     28 out = np.zeros(outlen_n)
     29 skladf.seek(0)

File ~\AppData\Roaming\Python\Python310\site-packages\soundfile.py:340, in
 write(file, data, samplerate, subtype, endian, format, closefd)
    338 else:
    339     channels = data.shape[1]
--> 340 with SoundFile(file, 'w', samplerate, channels,
    341               subtype, endian, format, closefd) as f:
    342     f.write(data)

File ~\AppData\Roaming\Python\Python310\site-packages\soundfile.py:655, in
 SoundFile.__init__(self, file, mode, samplerate, channels, subtype, endian,
 format, closefd)
    652 self._mode = mode
    653 self._info = _create_info_struct(file, mode, samplerate, channels,
    654                                  format, subtype, endian)
--> 655 self._file = self._open(file, mode_int, closefd)
    656 if set(mode).issuperset('r+') and self.seekable():
    657     # Move write position to 0 (like in Python file objects)
    658     self.seek(0)

File ~\AppData\Roaming\Python\Python310\site-packages\soundfile.py:1213, in
 SoundFile._open(self, file, mode_int, closefd)
   1210 if file_ptr == _ffi.NULL:
   1211     # get the actual error code
   1212     err = _snd.sf_error(file_ptr)
-> 1213     raise LibsndfileError(err, prefix="Error opening {0!r}: ".
 format(self.name))
   1214 if mode_int == _snd.SFM_WRITE:
   1215     # Due to a bug in libsndfile version <= 1.0.25, frames != 0
   1216     # when opening a named pipe in SFM_WRITE mode.
```

```
1217        # See http://github.com/erikd/libsndfile/issues/77.
1218        self._info.frames = 0

LibsndfileError: Error opening '../audio/tmp/8000/39.wav': System error.
```
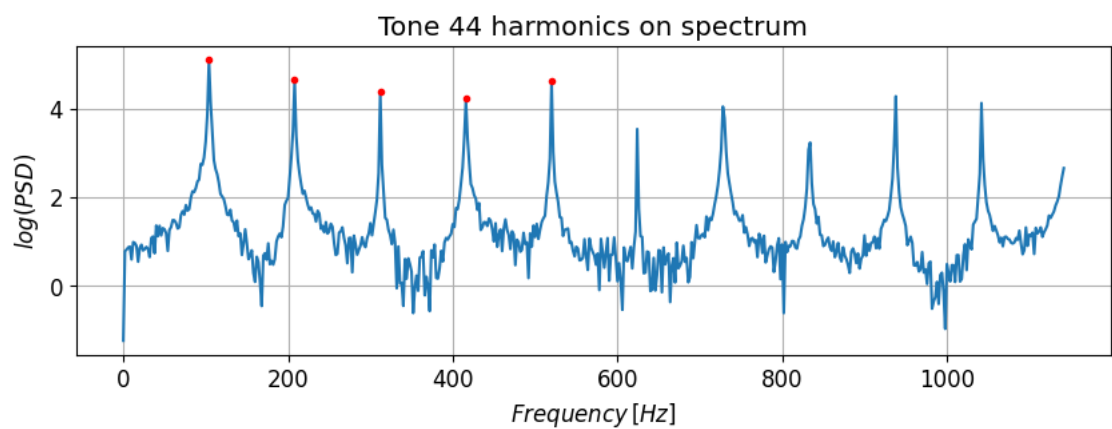
```
[ ]:  from task7 import task7
      task7()
```


Spectrogram of out_48k.wav

Spectrogram of out_8k.wav