fft_test

July 4, 2023

```python
[ ]: import numpy as np # numpy
     import matplotlib.pyplot as plt # matplotlib
```

```python
[ ]: ###   ( ) ###
     f_s = 44100 #       f_s[Hz] ( )
     t_fin = 1 #      [s] ( )
     dt = 1/f_s #        dt[s]
     N = int(f_s * t_fin) #     [ ]
```
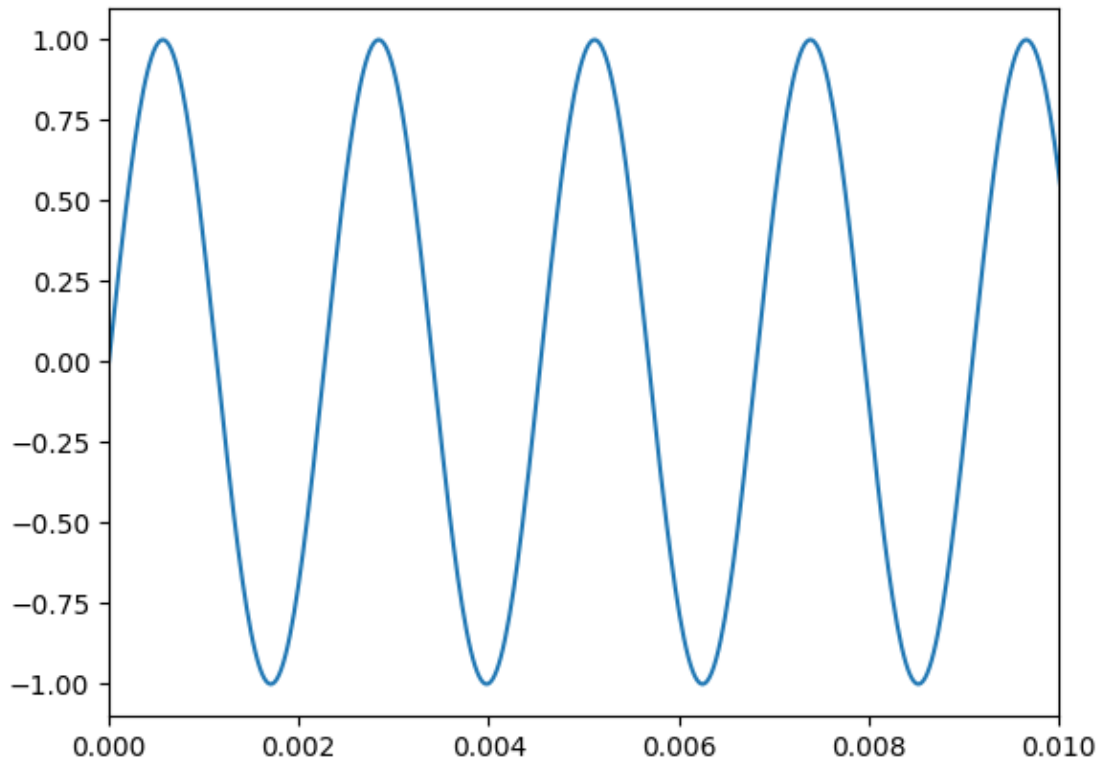
```python
[ ]: ###     y(t) ###
     f0 = 440 #    f0[Hz]
     t = np.arange(0, t_fin, dt) #    t[s]
     y = np.sin(2*np.pi*f0*t) # y(t)
```

```python
[ ]: ### y(t)      ###
     plt.plot(t, y) # y-t
     plt.xlim(0, 10*10**-3) #
     plt.show() #
```

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```
### FFT: t   f     ###
y_fft = np.fft.fft(y) #
freq = np.fft.fftfreq(N, d=dt) #        *
Amp = abs(y_fft/(N/2)) #
```

```
###        ###
plt.plot(freq[1:int(N/2)], Amp[1:int(N/2)]) # A-f
# plt.xscale("log") #
plt.xlim([400,500]) #x    1~5
plt.show()
```

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