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#!/usr/bin/env python2
# -*- coding: utf-8 -*-
"""
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Returns the FFT amplitude and the frequency vector for a given signal

Input:  singal  -----  signal in time domain
        Fns     -----  sample frequency

Output  frq     -----  frequency vector
        ampl    -----  vector with amplitude
        phase   -----  vector with the phase
        H       -----  vector with complex frequency domain
"""
import numpy as np

def get(signal, Fns):

    # ----- get FFT
    n = signal.size
    H = np.fft.fft(signal)
    amplH = abs(H)

    # get frequency vector and normalize frequency domain
    fn = Fns/2
    df = Fns/n
    frq = np.arange(0,fn,df)
    ind = int(np.round(n/2))
    ampl = np.append(amplH[0]/n, amplH[1:ind]/(n/2))
    H = np.append(H[0]/n, H[1:ind]/(n/2))
    phase = np.angle(H)
    return (frq, ampl, phase, H)

```