Practice No 2 part 2

The exercise marquee with (*) are only for graduate students.

1. Training on FFT
    1. Let's start playing with FFT to understand the way it works on python. First, just to check we understand, let's work in 1-d. Generate de function of eq (1) for x between 0 and 7 and plot it.

$$f(x) = 1 \, si \, 3 \leq x \leq 4$$
$$f(x) = 0 \, sino$$

    2. Apply FFT (np.fft.fft) on this and plot it (real part) verify it gives the equation (2). In order to get the array of values `k` you have to use the function np.fft.fftfreq(). If your array in x space is x_arr, you get the k array k_arr as:

        np.fft.fftfreq(arr_x.shape[-1])

$$\hat{f}(k) \propto \frac{\sin(k\pi)}{k\pi}$$

    3. Finally apply IFFT (np.fft.ifft) and verify you recover the original function.