Exercise Fourier Transform in PPG application

Please download the sampled PPG signal $x(n)$ ppg_train8.xlsx. This dataset is attached to publication 'Real-world PPG dataset'. https://data.mendeley.com/datasets/yynb8t9x3d/1

Each PPG signal contains 300 samples (6 seconds recording) with 50 sample/second sampling rate.

Please analyze the signal as follows using MATLAB:

- Plot the signal x(n) and add high frequency Gaussian noises

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Hint:

% Generate and add high-frequency noise

noise_amplitude = 200; % Amplitude of the high-frequency noise

high_freq_noise = noise_amplitude * rand(length(x),1);

x_noisy = x + high_freq_noise;

- Perform a discrete frequency analysis on the signal and determine the amplitudes and frequencies of the signal.

- Remove high frequencies that are assumed to be noise (by setting high frequency components to 0)

- Perform an inverse Fourier Transform to reconstruct $\tilde{x}(n)$.