Low Pass Filter Simulation in Python

Objective:
To simulate and analyze the behavior of a Low Pass Filter (LPF) using Python.

Description:
This project demonstrates how a digital low-pass filter can remove high-frequency noise from a signal. A noisy sine wave (5Hz + 50Hz noise) is generated, and a 4th-order Butterworth low-pass filter with a 10Hz cutoff is applied using SciPy.

Tools Used:
- Python 3 (Spyder / Anaconda)
- NumPy, SciPy, Matplotlib

Results:
The filter successfully removes high-frequency components from the noisy signal, leaving a smooth waveform representing the low-frequency content.

Conclusion:
This simulation illustrates the effectiveness of digital filtering in signal processing.
It can be extended to real sensor data in embedded systems or IoT applications.

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