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What have we learned?

The discrete Fourier series is simply a different name for the DFT, when the inherent periodicities are considered explicitly: N -periodic sequences in the time domain are mapped onto N -periodic sequences in the frequency domain. Furthermore, the definition of the DFS retrospectively better justifies the use of circular shifts as the natural extension of shifts for finite-length sequences.

We also remarked that, if we take the DFT of L repetitions of a finite-length sequence of length N , we obtain a series that is non-zero only at multiple integers of L . Moreover, these non zero coefficients are just scaled versions of the DFT coefficients of the original finite-length sequence. Therefore, all the spectral information of an N -periodic sequence is entirely captured by the DFT coefficients of one period.

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