

6th Exercise in Digital Information Processing

1. Calculate the DFT ($N=4$) of a sampled sine signal $x(n) = \sin(2\pi\frac{f}{f_s}n)$. The frequency of the sine signal is one fourth of the sampling frequency.
2. What is the name of the smallest unit within a signal flow diagram of a FFT? Plot the graphical symbol for it!
3. A prerequisite for using the FFT-Algorithm is that the number of sampled values must be a power of 2. What can you do if this is not the case? Can you use the FFT nonetheless?
4. A signal contains frequencies of 1010Hz and 1020Hz. How many FFT-coefficients are required to resolve the two frequencies in the spectrum when a sampling frequency of 8Khz is used?