# Lecture 2 assignments

## Exercise 3

The fast Fourier transform (fft) is an algorithm which computes the discrete Fourier transform (dft) of a set of samples, only in a more efficient matter. With a data size ***n***, the computation of dft takes time, while computing a fft takes time. What this means for the fft, is that for a data set of size ***n***, the algorithm must execute amount of operations. The input of a dft is a complex signal – a signal with a real and imaginary component. For computing dft, an amount of complex multiplications are needed.

The fft has a lower runtime than the dft and thus a higher efficiency rate. It is worth mentioning that the fft is not its own operation, but a family of algorithms whose purpose is to calculate the discrete Fourier transform. Examples of fft’s are the Cooley-Turkey algorithm and the Sande-Tukey algorithm.