Computational Astrophysics

Fast Fourier Transfer (FFT)

1. Write a general FFT code for 2^N data points. Make sure of use correct pair of even and odd data point at the 1^{st} stage to begin.

(a). Use the data points A=[0, 0, 1, 0, 0, 0, 0, 0] for N=3. Show the result of FFT. Also do an inverse FFT to get back A.

2. Do a FFT of $f(t) = \cos(6\pi t)$ for Δt=0.5, 0.25, 0.15, 0.1 respectively.

(a) Plot $|f(\omega)|^2$ vs frequency ω.

(b) What could be the optimum choice of Δt and duration T to produce a good FFT?