What this code is about

The C++ code fourth.cpp computes the fourth term in equation (3.55)

$$\sum_{k=0}^{\infty} \frac{(-1)^k \mu_{-(2k+2)}}{\beta^k} = \sum_{k=0}^{\lfloor \frac{d}{2} \rfloor - 1} \frac{(-1)^k}{\beta^k} \left(A_{2k} + B_{2k} + C_{2k}\right) + \sum_{k=\lfloor \frac{d}{2} \rfloor}^{\infty} \frac{(-1)^k}{\beta^k} D_{2k}, \quad (1)$$

where

$$D_k = \sum_{m=0}^{d} c_m m! \sum_{l=0}^{m} \frac{(-1)^l}{(l!)^2 (m-l)!} \int_0^{\infty} \frac{e^{-x/2}}{x^{k+\nu+1-l}} \mathrm{d}x \quad (2)$$

and

$$\int_0^{\infty} \frac{e^{-x/2}}{x^{k+\nu+1-l}} \mathrm{d}x = \frac{(-1)^{k-l+1} \left(\frac{1}{2}\right)^{k-l+1+\nu} \pi}{\Gamma(k-l+1+\nu) \sin(\pi\nu)}. \quad (3)$$

The code requires the $d+1$ numbers c_m's as inputs. These are read-in from the file Constant.txt. The code outputs values for for $\beta = 10^{-2} - 10^{25}, 0.2$ and $\beta = 4$ and writes to the file FOURTH.txt. In the applications we considered here, we typically compute the term (1) up to $k = 2d$.

The file compile.job is a SLURM script to compile the code in an HPC and generate an executable.

The file together.job is a SLURM script to run the executable in an HPC.