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## What this code is about

The C++ code first.cpp computes the first term in equation (3.10)

$$\sum_{k=0}^{\infty} \frac{(-1)^k \mu_{-(k+1)}}{\beta^k} = \sum_{k=0}^d \frac{(-1)^k}{\beta^k} (A_k + B_k + C_k) + \sum_{k=d+1}^{\infty} \frac{(-1)^k}{\beta^k} D_k, \quad (1)$$

where

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

and

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

The code requires the  $d+1$  numbers  $c_m$ 's as inputs. These are read-in from the file Constants.txt. The code outputs values for  $\beta$  contained in the file FIRST.txt.

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.

The file mpfr.sh is a shell script used to compile and run the code in an Ubuntu 22.04 local machine.