What this code is about

The C++ code moments.cpp computes the perturbation expansion coefficients ϵ_k

$$E(\beta) = -\frac{1}{2}\sum_{k=0}^{\infty} \epsilon_k (-\beta)^k, \qquad \epsilon_0 = 1 \tag{1}$$

for the ground-state energy of the funnel potential. They are given by

$$\epsilon_k = 6\, a_2^{(k)} \tag{2}$$

the coefficients are given by

$$a_2^{(k)} = \frac{1}{2}\left(5a_3^{(k)} + \sum_{l=2}^{k-2}\sum_{p+q=j} a_p^{(l)} a_q^{(k-l)}\right), 1 < j \leq k-2, \tag{3}$$

and $a_2^{(1)} = -1$, $a_{k-1}^{(k)} = 0$, $a_1^{(k)} = 2a_2^{(k)}$. The coefficients $-\epsilon_k$ are written to the file moments.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.