What this code is about

The `c++` code `third.cpp` computes the third term in equation (4.26) in the paper,

$$\sum_{k=0}^{\infty} \frac{(-1)^k}{\beta^{k-1}} \mu_{-(2k+2)} = \sum_{k=0}^{\lfloor \frac{d-1}{2} \rfloor} \frac{(-1)^k}{\beta^{k-1}} \left(I_k + J_k + L_k\right) + \sum_{k=\lfloor \frac{d-1}{2} \rfloor + 1}^{\infty} \frac{(-1)^k}{\beta^{k-1}} M_k, \quad (1)$$

where

$$L_k = \sum_{m=2k+1}^{d} c_m m! \sum_{l=2k+1}^{m} \frac{(-1)^l \, (l-2k-1)! \, 2^{l-2k}}{(l!)^2 (m-l)!}, \quad (2)$$

and

$$\int_0^{\infty} \frac{e^{-x/2}}{x^{2k+1-l}} \mathrm{d}x = \frac{(-1)^{1-l} \left(\frac{1}{2}\right)^{2k-l}}{(2k-l)!} \left(\ln\left(\frac{1}{2}\right) - \psi(2k+1-l) \right). \quad (3)$$

The code requires the $d+1$ numbers c_m's as inputs. These are read-in from the file `../Constants/Constant.txt`. The code outputs values for $\beta = 10^{-5} - 10^{23}, 0.2$ and $\beta = 4$ to the file `..results/THIRD.txt`.

The file `run.sh` encapsulates commands to build and run the application using the `CMakeLists.txt` on local machine running on Ubuntu 24.04.