What this code is about

The `c++` code `function.cpp` computes the highlighted term below appearing in the right-hand side of equation (4.39)

$$f(\kappa) = -\sum_{n=0}^{\infty} \frac{\mu_{-(2n+2)}}{\kappa^{n-1}} - \kappa\Lambda(\kappa) + \frac{i\pi}{2}\kappa^{3/2}\rho\left(\frac{1}{\sqrt{\kappa}}\right), \tag{1}$$

where

$$\Lambda(\kappa) = \frac{\sqrt{\kappa}}{2}\ln\left(\sqrt{\kappa}\right)\left(\rho\left(\frac{1}{\sqrt{\kappa}}\right) - \rho\left(-\frac{1}{\sqrt{\kappa}}\right)\right). \tag{2}$$

where

$$\rho(x) = xg(x) = xe^{-x/2}\sum_{m=0}^{\infty} c_m m! \sum_{k=0}^{m} \frac{(-x)^k}{(k!)^2(m-k)!}. \tag{3}$$

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

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