What this code is about

The `c++` code `delta.cpp` computes the nonlinear sequence transformation,

$$\delta_n = \frac{\sum_{j=0}^{n}(-1)^j \binom{n}{j} \frac{(1+j)_{n-1}}{(1+n)_{n-1}} \frac{s_j}{\mu_{j+1}}}{\sum_{j=0}^{n}(-1)^j \binom{n}{j} \frac{(1+j)_{n-1}}{(1+n)_{n-1}} \frac{1}{\mu_{j+1}}}, \tag{1}$$

of an infinite series whose partial sums are $s_n = \sum_{j=0}^{n} \mu_j$. The factors of the form $(1+j)_{n-1} = \Gamma(j+n)/\Gamma(j+1)$ are the Pochhamers symbol. The code computes the nonlinear sequence transformation of the divergent nonalternating weak field expansion of the Heisenberg-Euler Lagrangian in the case of a purely electric background given in equation (3.3)

$$f(\kappa) = \sum_{n=2}^{\infty} a_n \kappa^n, \qquad a_n = (-1)^n (2n-3)! c_n, \qquad c_n = \frac{2-2^{2n}}{(2n)!} B_{2n}, \tag{2}$$

as $\kappa \to 0$, where B_{2n} are the Bernoulli numbers.

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. The results are written to a file say `delta_100.txt` when $n = 100$. Each line of the file corresponds to the value of $f(\kappa)$ for $\kappa = 10^{-5} - 10^{23}$, $\kappa = 0.5$ and $\kappa = 4.0$.