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## What this code is about

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

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

of an infinite series whose partial sums are  $s_n = \sum_{j=0}^n a_j$ . 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 alternating weak field expansion of the Heisenberg-Euler Lagrangian in the case of a purely magentic background given in equation (3.3)

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

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

The file `run.sh` encapsulates commands to build and run the application using the `CMakeLists.txt` on 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  $f(\beta)$  for  $\beta = 10^{-5} - 10^{23}$ ,  $\beta = 0.5$  and  $\beta = 4.0$