The map-based neuron model introduced in [Chialvo, *Generic excitable dynamics on a two-dimensional map*, Chaos, Solitons, & Fractals 5, 1995] takes the following form

$$x_{n+1} = f(x_n, y_n) = x_n^2 \exp(y_n - x_n) + k, \tag{1a}$$

$$y_{n+1} = g(x_n, y_n) = a y_n - b x_n + c, \tag{1b}$$

where x is a membrane voltage-potential and y is a recovery variable. The parameters $a \in (0,1)$, $b \in (0,1)$, $c > 0$ and $k \in \mathbb{R}$ (often $k \geq 0$) are interpreted, respectively, as the time-constant, the activation-dependence, the offset and the input current (perturbation of the voltage). The 1-dimensional subsystem

$$x_{n+1} = f(x_n, r) = x_n^2 \exp(r - x_n) + k, \tag{2}$$

where $r \in \mathbb{R}$ is a parameter, is called 1D or reduced Chialvo model. The model is given by iterating the map $f_r(x) := x^2 \exp(r - x) + k$.

In the forthcoming work [Llovera, Signerska-Rynkowska, Bartłomiejczyk, *Periodic and chaotic dynamics in a map-based neuron model*] we establish the following result:

Theorem 0.1. *If the 1D Chialvo map f_r satisfies the condition*

$$f_r^2(c) < f_r^3(c) < c < f_r(c) \quad (c = 2 \textit{ is the critical point}), \tag{3}$$

then it is chaotic in the sense of Li and Yorke, Block and Coppel, and Devaney.

The output of the program contained in the dataset is the (discretized) set of (r, k) values in a given parameter range for which the condition (3) holds.