Discrete-time Dynamic Systems: numerical solution, dimension 2

Time horizon $T := 5$

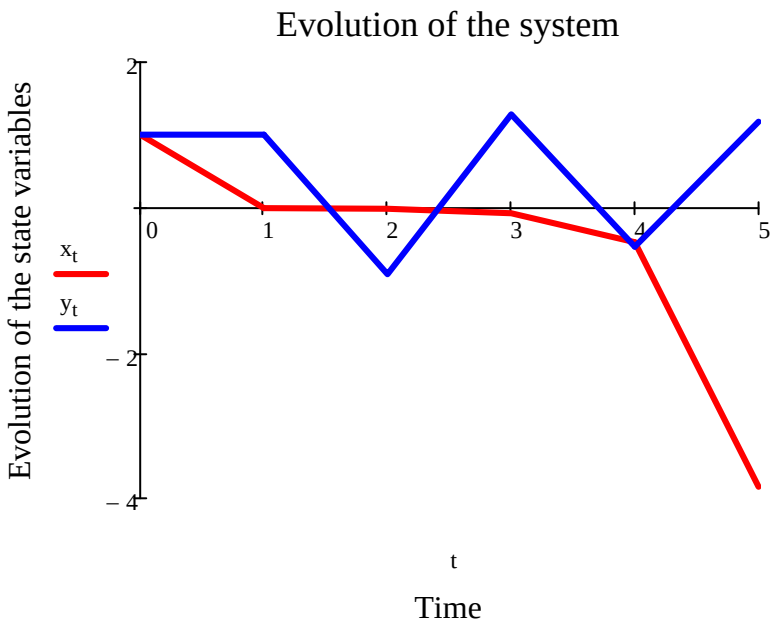
Evolution function $f(x, y, t) := \begin{pmatrix} 2 \cdot t \cdot x - \frac{x^2}{100} \\ 2 \cdot x - y + \frac{t^2}{10} \end{pmatrix}$

Boundary condition $x_0 := 1 \qquad y_0 := 1$

time counter $t := 0 .. T$

Motion law $\begin{pmatrix} x_{t+1} \\ y_{t+1} \end{pmatrix} := f\left(x_t, y_t, t\right)$

$t =$	$x_t =$	$y_t =$
0	1	1
1	-0.01	1
2	-0.02	-0.92
3	-0.08	1.28
4	-0.48	-0.54
5	-3.843	1.18


Evolution of the system
Evolution of the state variables
2
– 2
– 4
0
1
2
3
4
5
x_t
y_t
t
Time