Scheme 3 (note the nuances of this from the above):

Given x_0 and y_0, start iterations.

$$\begin{cases} y_{n+1} = y_n \underbrace{-y_n(\alpha_y - \beta_y y_n)}_{y_n'} \Delta t \\ x_{n+1} = x_n \underbrace{+x_n(\alpha_x - \beta_x y_{n+1})}_{x_n' \text{ with new } y_{n+1}} \Delta t \end{cases}$$

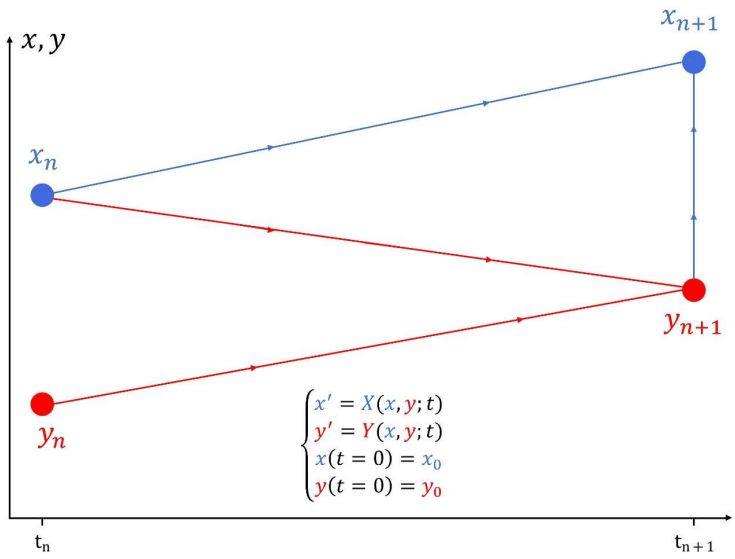

Figure 3. Like Scheme 2, this Scheme 3 advances "y" before "x".

These are Euler's method. All methods for single DE can be generalized to systems! You look them up when you need them.