

The scheme we just derived is known as Runge's (~ 1895) or modified Euler's or explicit midpoint method (EM).

We write it as

$$k_1 = f(t_j, y_j)$$

$$k_2 = f(t_j + h/2, y_j + h/2 \cdot k_1)$$

$$y_{j+1} = y_j + h \cdot k_2$$

← slope approx.!

$\tilde{y}_{j+1/2}$

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Another possibility is Heun's method

$$k_1 = f(t_j, y_j)$$

$$k_2 = f(t_j + h, y_j + h \cdot k_1)$$

$$y_{j+1} = y_j + \frac{h}{2} (k_1 + k_2)$$

or the explicit trapezoidal method (ET)

