Métodos numéricos

Euler 1er Orden

$$y_{i+1} = y_i + h.y'_i$$

Runge Kutta 4to orden

$$f(x_i, y_i) = y'_i = y'(x_i, y_i)$$

$$k_1 = h.f(x_i, y_i)$$
$$k_2 = h.f\left(x_i + \frac{h}{2}, y_i + \frac{k_1}{2}\right)$$
$$k_3 = h.f\left(x_i + \frac{h}{2}, y_i + \frac{k_2}{2}\right)$$
$$k_4 = h.f\left(x_i + h, y_i + k_3\right)$$

$$y_{i+1} = y_i + \frac{1}{6}\left(k_1 + 2k_2 + 2k_3 + k_4\right)$$

Método Predictor-Corrector 4to orden

$$y_{i+1}^{p} = y_i + \frac{h}{24}\left(55.f\left(x_i, y_i\right) - 59.f\left(x_{i-1}, y_{i-1}\right) + 37.f\left(x_{i-2}, y_{i-2}\right) - 9.f\left(x_{i-3}, y_{i-3}\right)\right)$$

$$y_{i+1}^{c} = y_i + \frac{h}{24}\left(9.f\left(x_{i+1}, y_{i+1}^{p}\right) + 19.f\left(x_i, y_i\right) - 5.f\left(x_{i-1}, y_{i-1}\right) + f\left(x_{i-2}, y_{i-2}\right)\right)$$

$$\left|y_{i+1}^{c} - y_{i+1}^{p}\right| < \varepsilon$$