TITULO

FECHA

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Método de Runge-Kutta

$h = 0.25 \quad x = 1 \quad \frac{dy}{dx} = x + 1 - y$

$y(0) = 1$

$x_{n+1} = x_n + h$

$y_{n+1} = y_n + \frac{1}{6} \cdot (K_1 + 2K_2 + 2K_3 + K_4)$

$K_1 = h \cdot f(x_n, y_n)$

$K_2 = h \cdot f\left(x_n + \frac{h}{2}, y_n + \frac{K_1}{2}\right)$

$K_3 = h \cdot f\left(x_n + \frac{h}{2}, y_n + \frac{K_2}{2}\right)$

$K_4 = h \cdot f(x_n + h, y_n + K_3)$

$n = 0$

$x_0 = 0 \quad y_0 = 1$

$n = 1$

$x_1 = 0.25 \quad y_1 = y_0 + \frac{1}{6} \cdot (K_1 + 2K_2 + 2K_3 + K_4) = 1.0288$

$K_1 = h \cdot f(x_0, y_0) = 0$

$K_2 = h \cdot f\left(x_0 + \frac{h}{2}, y_0 + \frac{K_1}{2}\right) = 0.03725$

$K_3 = h \cdot f\left(x_0 + \frac{h}{2}, y_0 + \frac{K_2}{2}\right) = 0.02734$

$K_4 = h \cdot f(x_0 + h, y_0 + K_3) = 0.05566$

$n = 2 \quad x_2 = 0.5$

$y_2 = y_1 + \frac{1}{6} \cdot (K_1 + 2K_2 + 2K_3 + K_4) = 1.1065$

$K_1 = h \cdot f(x_1, y_1) = 0.0552$

$K_2 = h \cdot f\left(x_1 + \frac{h}{2}, y_1 + \frac{K_1}{2}\right) = 0.0796$

$K_3 = h \cdot f\left(x_1 + \frac{h}{2}, y_1 + \frac{K_2}{2}\right) = 0.0765$

$K_4 = h \cdot f(x_1 + h, y_1 + K_3) = 0.0986$

TITULO

Metodo de Runge-Kutta

FECHA

$n=3 \qquad x_3 = 0.75$

$y_3 = y_2 + \frac{1}{6}\cdot(K_1 + 2K_2 + 2K_3 + K_4) = 1.2223$

$K_1 = h \cdot f(x_2, y_2) = 0.0980$

$K_2 = h \cdot f\left(x_2 + \frac{h}{2}, y_2 + \frac{K_1}{2}\right) = 0.1173$

$K_3 = h \cdot f\left(x_2 + \frac{h}{2}, y_2 + \frac{K_2}{2}\right) = 0.1149$

$K_4 = h \cdot f(x_2 + h, y_2 + K_3) = 0.1221$

$n=4 \qquad x_4 = 1$

$y_4 = y_3 + \frac{1}{6}\cdot(K_1 + 2K_2 + 2K_3 + K_4) = 1.3678$

$K_1 = h \cdot f(x_3, y_3) = 0.1319$

$K_2 = h \cdot f\left(x_3 + \frac{h}{2}, y_3 + \frac{K_1}{2}\right) = 0.1466$

$K_3 = h \cdot f\left(x_3 + \frac{h}{2}, y_3 + \frac{K_2}{2}\right) = 0.1448$

$K_4 = h \cdot f(x_3 + h, y_3 + K_3) = 0.1587$