Question

What are mesh points in Runge Kutta Fehlberg method?(Define mesh points)

Solution

To approximate the solution to the 1st order IVP using the Runge-Kutta-Fehlberg method:

$$y' = f(x, y), \qquad y(x_0) = y_0$$

we seek:

$$y_{n+1} = y_n + h \sum_{i=1}^{s} b_i k_i + O(h^{s+1})$$

and calculate the optimal step size h. The points $x_{n+1} = x_n + h$ are mesh points.

The Runge-Kutta-Felberg method consists in the fact that at each step of the method the accuracy of the function is determined by the difference in values between the results of the methods RK-4 and RK-5. If they differ by no more than ε- the required accuracy, then the value is considered an approximate value of the function y_{n+1} at the point x_{n+1} at the considered step. Otherwise, in the considered step, the new step value and the new value of the function are recomputed with the subsequent error estimate.