计算方法 作业报告9

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计算方法编程练习：常微分方程数值解

源程序：

Adams.c

程序的输入：

无

程序的输出：

```
Runge-Kutta
h = 0.100000, err = 1.780000e-05, ok = 4.094117
h = 0.050000, err = 1.042241e-06, ok = 4.050320
h = 0.025000, err = 6.290718e-08,ok = 4.025861
h = 0.012500, err = 3.861850e-09, ok = nan
Adams
h = 0.100000, err = 9.996353e-05, ok = 3.329629
h = 0.050000, err = 9.943139e-06, ok = 3.184940
h = 0.025000, err = 1.093354e-06, ok = 3.099311
h = 0.012500, err = 1.275779e-07, ok = nan
```

误差阶的计算

当 $h(k) = \frac{0.1}{2^k}$ 时，误差阶定义为

$$o_k = \frac{\log e_{h(k)} / \log e_{h(k+1)}}{\log(2)}$$

故当 $k = 3,\ h = 0.0125$ 时，$e_{h(k+1)}$ 未定义，因此手动将 ok 设置为 NAN