

#include <stdio.h>

#include <math.h>

#define EPS .00000001

#define A -0.02

#define B -1

double func\_f(double, double, double);

double func\_g(double, double, double);

int main()

{

double t = 0.0, x = 1.0, y = 1.0;

double h = 0.005, dt = 0.2, tmax = 30.0;

double r, ddt = 0.0;

double b1, b2, b3, b4;

double c1, c2, c3, c4;

printf("%5s %10s \n", "t", "x");

do

{

if (t >= ddt - EPS)

{

ddt += dt;

r = 2.0 \* exp(t) + exp(2.0 \* t);

printf("%10.4lf, %10.4lf\n", x, y);

}

b1 = func\_f(t, x, y);

c1 = func\_g(t, x, y);

b2 = func\_f(t + h / 2.0, x + h \* b1 / 2.0, y + h \* c1 / 2.0);

c2 = func\_g(t + h / 2.0, x + h \* b1 / 2.0, y + h \* c1 / 2.0);

b3 = func\_f(t + h / 2.0, x + h \* b2 / 2.0, y + h \* c2 / 2.0);

c3 = func\_g(t + h / 2.0, x + h \* b2 / 2.0, y + h \* c2 / 2.0);

b4 = func\_f(t + h, x + h \* b3, y + h \* c3);

c4 = func\_g(t + h, x + h \* b3, y + h \* c3);

x += (h / 6.0) \* (b1 + 2.0 \* b2 + 2.0 \* b3 + b4);

y += (h / 6.0) \* (c1 + 2.0 \* c2 + 2.0 \* c3 + c4);

t += h;

} while (t <= tmax);

return 0;

}

double func\_f(double t, double x, double y)

{

return (A \* x + B \* y) / sqrt(x \* x + y \* y);

}

double func\_g(double t, double x, double y)

{

return (A \* x - B \* y) / sqrt(x \* x + y \* y);

}