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//Program for Runge-Kutta method 4th order
//Coded by Ashwini Kumar Singh on 20-Apr-2021

#include<stdio.h>
#include <math.h>

double fn(double x,double y){
    double f=0.0;
    f=-y;
    return f;
}

int main(void)
{
    double x0,y0,h,x,y,xn,k1,k2,k3,k4,k;
    int i,n;

    printf("\nProgram for Modified Euler Method\n");
    printf("\nCoded by Ashwini Kumar Singh on 20-Apr-2021\n");
    printf("\nF(x,y)= dy/dx = -y\n");

    printf("\nEnter the value of x0,y0,h,xn: ");
    scanf("%lf,%lf,%lf,%lf",&x0,&y0,&h,&xn);

    x=x0;
    y=y0;
    n=(xn-x0)/h;
    printf("\nThe value of n: %d",n);

    printf("\nThe required solution
is:\n\tIter(i)\tx\t\tty\t\ttk1\t\ttk2\t\ttk3\t\ttk4\t\t\tk\tty(i+1)\n");

    for(i=0;i<n;++i)
    {
        k1=fn(x,y);
        k2=fn(x+0.5*h,y+0.5*k1*h);
        k3=fn(x+0.5*h,y+0.5*k2*h);
        k4=fn(x+h,y+k3*h);
        k=(h/6)*(k1+2*k2+2*k3+k4);
        y+=k;

        printf("\n\t%d\t\t%lf\t\t%lf\t\t%lf\t\t%lf\t\t%lf\t\t%lf\t\t%lf\t\t%lf\n",i,x,y-k,k1,k2,k3,k4,k,y);
        x+=h;
    }

    printf("\nThe required solution is: y(%lf) = %lf\n",xn,y);
    return 0;
}
```