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1: // C-Program for solving a differential equation using Euler's Method.
2:
3: #include<stdio.h>
4: #include<math.h>
5:
6: //Definition of a function. dy/dx = f(x,y) = x^2 - y
7: float f(float x, float y){
8:     float result = (x*x) - y;
9:     return result;
10: }
11:
12: //Program
13: int main(){
14:     //Variables
15:     float x0, y0, slope, h, xn, yn;
16:     int n, i;
17:
18:     //Inputs
19:     printf("Enter the initial conditions.\n");
20:     printf("Initial point x0 : ");
21:     scanf("%f", &x0);
22:     printf("Initial value of y[x = %.2f] : ", x0);
23:     scanf("%f", &y0);
24:     printf("Final value xn : ");
25:     scanf("%f", &xn);
26:     printf("Enter the value of no. of steps n : ");
27:     scanf("%d", &n);
28:
29:     //Calculation of width of intervals.
30:     h = (xn-x0)/n;
31:
32:     //Output
33:     printf("\nx\t\ty\n");
34:     printf("-----\n");
35:     for(i=0; i<=n; i++){
36:         yn = y0+h*f(x0,y0);
37:         y0 = yn;
38:         x0 = x0+h;
39:         printf("x(%d) = %.2f y(x=%.2f) = %.2f\n",i,x0,x0,yn);
40:     }
41: }

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