|  |
| --- |
| #include <math.h> |
|  | #include <stdio.h> |
|  |  |
|  | /\* Defining the function for which the integral is to be calculated \*/ |
|  | double f(double x) { |
|  | return (1 / (1 + x \* x)); |
|  | } |
|  |  |
|  | int main() { |
|  |  |
|  | int i, n; |
|  | double x0, xn, h, y[20], so, se, ans, x[20]; |
|  |  |
|  | // taking input |
|  | printf("\nEnter values of x0(lower limit), xn(upper limit), h(height of each sub interval):\n"); |
|  | scanf("%lf%lf%lf", &x0, &xn, &h); |
|  |  |
|  | // calculating the number of intervals |
|  | n = (xn - x0) / h; |
|  | if (n % 2 == 1) { |
|  | n = n + 1; |
|  | } |
|  | h = (xn - x0) / n; |
|  |  |
|  | printf("%lf interval size ~ %d intervals\n", h, n); |
|  | printf("x\t\ty\n"); |
|  |  |
|  | for (i = 0; i <= n; i++) { |
|  | x[i] = x0 + i \* h; |
|  | y[i] = f(x[i]); |
|  | printf("%lf\t%lf\n", x[i], y[i]); |
|  | } |
|  |  |
|  | so = 0; //sum of add terms |
|  | se = 0; //sum of even terms |
|  |  |
|  | for (i = 1; i < n; i++) { |
|  | if (i % 2 == 1) { |
|  | so = so + y[i]; |
|  | } else { |
|  | se = se + y[i]; |
|  | } |
|  | } |
|  | ans = (h / 3) \* (y[0] + y[n] + 4 \* so + 2 \* se); |
|  |  |
|  | printf("Value of the integral is:: %lf", ans); |
|  |  |
|  | return 0; |
|  | } |