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Week 10 – Classes/Structures

Explanation of the program

This program approximates the value of a definite integral using the trapezoidal method. The default function is f(x) = sqrt(x) but this can be changed to any function that can be created using default libraries (I used cmath).

Important Varibles

1. x0 – lower bound of the integration
2. x1 – upper bound of the integration
3. n – number of subdivisions (degree of precision, higher is more precise)
4. area – value of the integral (area of the trapezoids)

struct IntegralStruct

The struct simply stores values associated with the calculation (upper bound, lower bound, value of n, and area of the integral).

Functions:

1. *IntegralStruct calculateIntegralValues();*

This function gets the value of the lower bound, upper bound, and value of n from the user then returns a structure.

1. *void printIntegralInfo(IntegralStruct tempIntegral);*

This function prints out the members of struct.

1. *void createIntegralSet(IntegralStruct tempApprox[], int tempApproxSize);*

This function creates an array of IntegralStruct. It asks the user for the upper and lower bounds and the size of the array (which is also the number of values of n that will be used to for calculations).

1. *double trapezoidal(double a, double b, double n);*

This function is the trapezoidal method of approximating the definite integral of a function. This is the function that actual calculates the areas using the values of n acquired by function 3.