Ams595_C++_HW2

apporximations.h :

Declare the function to be used in approximations.cpp and HW2main.cpp
This function takes an integer N as input and returns a dynamically allocated array of doubles
The array contains approximations based on the provided value of N

HW2main.cpp :

This C++ program calculates approximations of Pi using two methods. It evaluates Pi for a single value of N (Q1) and multiple intervals (Q2). The results are displayed, including the approximation and error. The code is structured with modular functions, promoting readability and extensibility. Overall, it provides a flexible and informative tool for Pi approximation.

Approximations.cpp

takes a vector of intervals and calculates corresponding Pi approximations using the pi_approx function. The results are stored in a dynamically allocated array, emphasizing the responsibility of the caller to free the allocated memory. The function encapsulates a clear iteration process, making it modular and efficient for computing Pi approximations.

pi_approx.cpp

 f calculates the y-value of a semi-circle at a given x-coordinate, and pi_approx employs the trapezoidal rule to approximate Pi with N intervals. The pi_approx function iterates through intervals, computes the area under a semi-circle curve, and returns both the Pi approximation and the absolute error. Clear comments within the code enhance readability, providing insights into the mathematical computations and their significance for approximating Pi.

pi_approx.h

This C++ header file, "pi_approx.h," defines a structure named PiResults with members approx and. error to encapsulate the results of Pi approximation. The

pi_approx function prototype is also declared, taking an integer N as input and returning a PiResults structure containing the Pi approximation and its corresponding error. The header file serves as an interface for Pi approximation functionality, promoting code modularity and ease of integration with other programs. The clear structure and function declaration enhance code organization and readability, facilitating the implementation of Pi approximation in diverse applications.