2021 Spring CPSC 240

Assignment 2 Quadratic Formula

Preface

This program is based on Algebra II of the tenth grade. There the quadratic formula was taught. Now we build the software solutions for quadratic equations using hybrid programming techniques. Hybrid programming allows use to incorporate calls to modules written in other languages by other people.

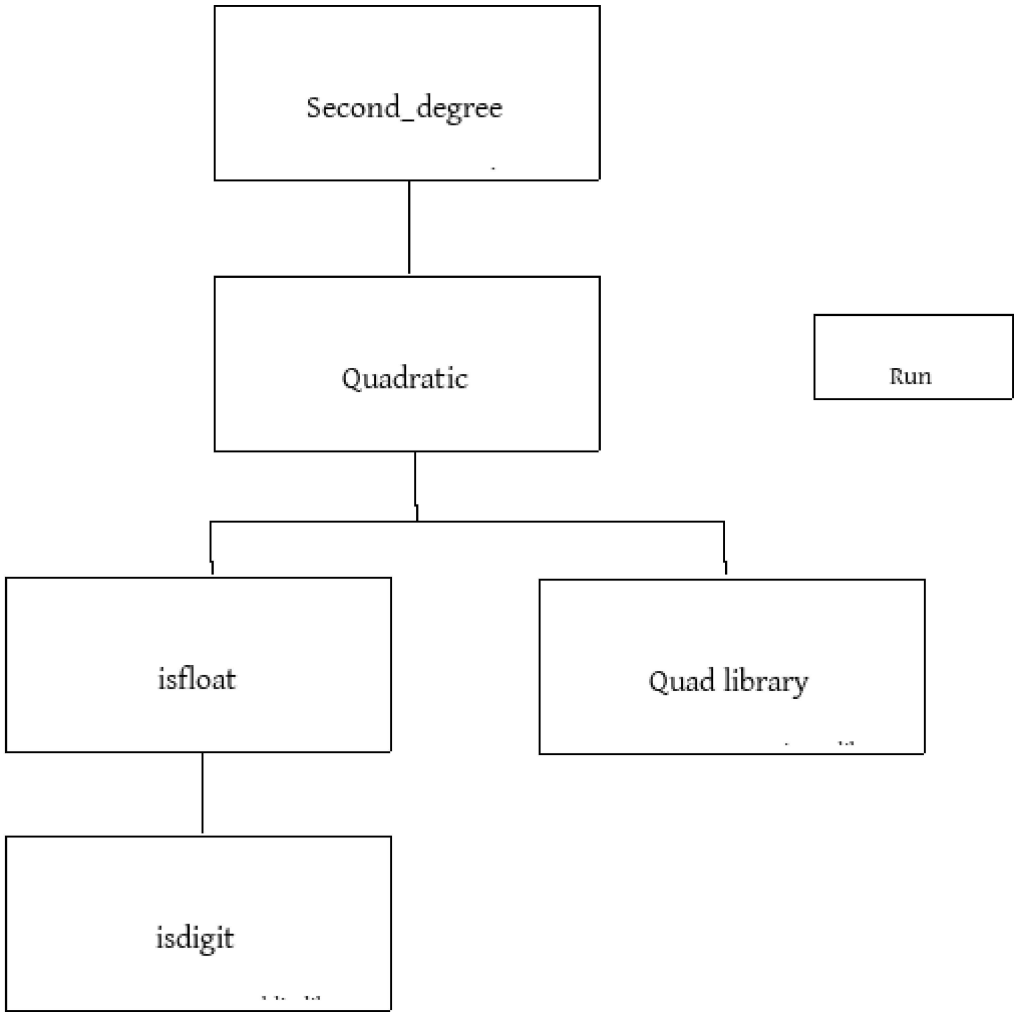
Requirements

A quadratic equation looks like $ax^2 + bx + c = 0.0$ where a, b, and c are the quadratic coefficient, the linear coefficient, and the constant coefficient respectively. The three number are floating point real numbers

Make a program that will input the coefficients and output the roots.

Calling structure

C Language required == >



Quad library is a file containing three functions:

void show_no_root()
void show_one_root(double root)
void show_two_root(double root1, double root2)

yes, I know this violates the rule of one to one correspondence between functions and files. However in this case, the three functions are so trivial we should just put all three in one file.

You're really lucky. Three out of five modules are written in C++.

Sample execution with valid inputs

Welcome to Root Calculator
Programmed by John Paul Jones, Professional Programmer.

This program will find the roots of any quadratic equation.
Please enter the three floating point coefficients of a quadratic equation in the order a, b, c separated by white spaces. Then press enter: 3.7 -2.955 5.14 <enter>

Thank you. The equation is 3.7x^2 + -2.955x + 5.14 = 0.0

The roots are -11.83561 and 5.87893
One of these roots will be returned to the caller function.
The main driver received -11.83561 and has decided to keep.
Now 0 will be returned to the operating system. Have a nice day. Bye.

Color codes:
The text in yellow is produced by the module “Quadratic”.
The text in green is produced by the driver.
The text in pink is produced by a function in the quad library.

Footnote: The displayed roots on this page are not mathematically correct. They are for visual effect only.

Your outputs must be mathematically correct.

Sample execution with invalid inputs

Welcome to Root Calculator
Programmed by John Paul Jones, Professional Programmer.

This program will find the roots of any quadratic equation.
Please enter the three floating point coefficients of a quadratic equation in the order a, b, c
separated by white spaces. Then press enter: 2.6 <enter>
5U4.85 <enter>
3.999 <enter>

Invalid input data detected. You may run this program again.

The main driver received 0.00000 and has decided to keep it.
Now 0 will be returned to the operating system. Have a nice day. Bye.

Finish the assignment

You need to submit five files. There is a sixth function isdigit, but that is part of the C++ library of functions. You don't have to submit copies of functions in public software libraries.

Next, make your software have the appearance of professionalism. Make your source files cosmetically so appealing that you will gladly show your work to the technical interviewer during the job search process.

Make sure your code is licensed by GPL3.

If you use code such as a complete function with an open source license and you make absolutely no changes to the code, then there is no point in adding your own second license to the function. The original license is enough.

Make sure all the professor's comments are removed. You may freely reuse source code instructions. That is the permission given to you by the GPL3.

All numbers in this program are 64-bit float numbers.

When outputting a float number show from 6 to 12 decimal digits on the right of the point. You decide on the exact number of digits.

Replace the fake name in the sample dialog with your own name.

Submission

Make sure you submit all five files the first time. There is no second chance to submit one missing file later. It is best not to zip the files. Simply send 5 attachments.

Send to holliday@fullerton.edu with subject line: "240-x assignment 2 for credit". Replace the 'x' with the number of your own section.

Dates: Submitted programs must be time stamped (Pacific time zone) between February 28, 2021 at 2:00am and March 1, 2021 at 2:00am.