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Programming Assignment 2: Quadratic Equation Solver

How you develop your assignment solution

The way to find out the root(s) of the quadratic equation is find out the discrimination D = b^2 - 4ac and determine if D > 0, there are two real roots. While if D = 0, there are two equal real roots. While if D < 0, there are two complex roots. The key is to find out the discrimination and divided the situation into three different parts. If D > 0, the two different real roots are $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. If D = 0, the two same real root is $x = \frac{-b}{2a}$. If D < 0, the two complex roots are divided into real part $x = \frac{-b}{2a}$ and imaginary part $x = \frac{\sqrt{b^2-4ac}}{2a}$.

How to produce pretty printing format in quadratic equation and solution.

The way I ensure the printing format stay pretty is that I print out the equation step by step in the order ‘a’, ‘b’, ‘c’ and the roots.

To ensure that ‘a’ stay pretty, included ‘a’ would never be zero, I divided the possibility of ‘a’ into different groups. Included a>1, a<-1, a=0, a=1, a=-1, to make sure if I input a>1, it print out aX^2, if a<1, it print out aX^2, if a=1, it print out X^2, if a=-1 it print out -X^2, if a=0, it print out error.

Following by is ‘b’being printed after ‘a’, for the coefficient ‘b’, I also divided into the group of b>1, b<-1, b=1, b= 0 but no need to divide the group b=0, because b=0 is no need to print any thing. If b>1, print out bX, if b<-1, print out bX(but b is a negative number), if b=0, print out b and if b= -1 print out -X, if b=0 there is no X.

After ‘b’ comes in ‘c’, for the constant ‘c’, I divided into the group of c>=1, c<0, two groups only. If the constant is positive, it means that c>=1, the 1 is also allowed to be printed out as the constant, so not only c>1, but c>=1, if the constant is negative, it means c<0, the biggest negative integer is -1, and it is >0, -1 is also allowed to be printed out as the constant.

In order to ensure pretty printing format, the equation is printed out individually and step by step, by verifying ‘a’, ‘b’ and ‘c’ with instruction and in order, finally print out the equation and the root, no matter the roots is two real root, two equal roots or two complex root with real part and imaginary part. By printing out the roots, it complete the program of solving the quadratic equation.