Secant and False Position Method

Numerical Computation

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Project #3

The Secant Method was used to find a root of an equation by finding a point and determined it if had a root by proximity to the x-axis. The secant method requires two points, which we used from our given interval, [-7,-5] and [-5,-3]. The secant method was used to find a root of f(x)=0. The false position method also uses two points. The false position differs from the secant in this case with the amount of intervals.

Results: For intervals [-7,-5], using the secant method, the maximum amount of iterations were 5, while the least were 4 using the Absolute relative error. The root came out to be -5.78 as shown in Figure1. With interval [-5,-3], the maximum amount of iterations before finding the root was using the Absolute error, taking 7 iterations, while the shortest was 6, both the absolute relative and true error. The root for the second interval using the secant method was -3.66, as seen in figure 1. For the False Position method there was a slight convergence issues where the repeated error did not stop, until I adjusted the code, if the error calculation kept repeating to break. The iterations are shown in following figures but as seen for intervals [-7,-5], it took 16 iterations for both the absolute error and relative while only 7 for the absolute true error. Also converging to root= -5.759. For interval [-5,-3], there were less iterations but again the absolute error and absolute relative error where the maximum with 9 iterations while the true error gave us the least of 5 iterations, all converges to -3.668. Overall both methods are faster than the bisection method but I had the most complications with the false proposition method.





