Bisection method

The bisection method is one of the simplest iteration methods. The bisection is in mathematics is a root finding method that repeatedly bisects an interval and then bisect a sub-interval in which a root must lie for further processing.

Advantages

* Easy to understand
* Since it make the range half every time one can be sure to have a slightest error.
* Roots are found in a short period of time.
* The method brackets the root, the method is guaranteed to converge.
* The bisection method although slow is a sure-fire method it never fails as compare to other methods

Disadvantages

* If one of the initial guesses is closer to the root it will take larger number of iterations to reach the root.
* It is a slow method as compared to others.

False position method

False position method is an algorithm for finding roots which retains the prior estimate for which the function value has opposite sign from the function value at the current best estimate of the root.

Advantages

* It doesn’t require the derivative.
* It is quick method as compared to bisection method.

Disadvantages

* One of the interval definitions can get struck.

Newton Raphson method

The Newton-Raphson method is a way to quickly find a good approximation for the root valued function

Advantages

* Large region of convergence.
* Fast convergence as long as initial guess is closure to the solution.

Disadvantages

* It require very accurate initial value or initial guess xo must be near the root you need to approximate.
* It requires the derivatives of f(x), if complicated then the method will tend to fail.