

Bisection Method Solver

Consists of:

1- **Func Delegate** (Delegate declaration)

2- **Functions class:** to enter function to be solved.

3- **Bisection class:**

contains 6 static attributes used by the static method (Bisection_Method)
which takes 4 input parameters:

- a- **FunctionDel** : Function from the delegate.
- b- **Start**: Start point of the Interval.
- c- **End**: End point of the Interval.
- d- **Guess**: User guess of the solution (optional).

- Starts with checking if there is a value of (guess) and if not, it is assigned to be the average between start and end points.
- Then check the values of the interval (Explained in Wrong Interval Exception)
- Check if one of the initial values of start or end or average is the solution
- Bisection Logic (Narrowing the Interval to reach $f(x) \approx 0$) until difference between the Interval is less than 0.0001
- Return the Answer

4- **Wrong Interval Exception Class:**

Defining a new Exception for the following cases:

- a- If the Interval Entered does not contain the root.
- b- If the Interval Entered contains more than one root.
- c- If one of the values inside the interval causes a math error
 - ex. • Divide by zero.
 - Square root of Negative value.
 - Log() or Ln() of negative numbers or zero.

5- **Program Class (Main Function)**

- Initialize the Interval
- Create an instance of the delegate.
- Call Bisection_Method function
- Projection of solution