ALA-a - project 1 - solver performance

Solving $f(x) = 0$ for $f : R \to R$

1. Write a matlab program for finding roots of equations of the form $f(x) = 0$ using Bisection. Develop the program as far as you like, but start by writing a matlab function with input f, int and tol, where f is the name of another matlab file where you define f(x), int is a given interval containing a root, and tol is a given tolerance for the length of the output interval, obtained after iterated bisection of the given interval. To improve your program, you may add suitable handling of non adequate data (like a given interval not containing a root, for example), an interpolated root based on the residuals in the two endpoints of the final interval etc, etc. Maybe you can even write a program that automatically finds all roots of a given equation.

2. Write a corresponding matlab program using fixed point iteration.

3. Test the programs by solving some simple equations where you happen to know the solution, to make sure that they work properly. The experience from such test applications may also deserve to be reported in the end.

4. Use the programs to find the solutions of some of the equations appearing in project 1.