Describe the problems to be solved, the mathematical approaches used on them, and any unique features of your codes

Discuss all of your computed results. In this portion, you should include your plots and/or your necessary Matlab outputs to support your  
obervations, discussions and answers to posed questions.

1. What are the problems?
2. How do I solve them?
3. What are the results?
4. Why are the results reasonable

Be logic, clear, precise, and concise

1. Problem

Implement bisection algorithm for finding root of nonlinear equation.

2. Description of Work

1) Make nonlinear function file f1.m

Here

2) Make Test routing test\_bisect.m

Here error tolerance of , using starting interval of [-5, 5]

3) Implement bisection.m function

Step1: Approximate the root r by the middle point

Step2: If (error tolerance), stop the method, Otherwise continue to the next step.

Step3: If f(a) and f(c) have different signs, the root r is in [a,c], and we assign c to a new b; Otherwise (i.e. f(c) and f(b) have different signs), the root r is in [c, b], and we assign c to a new a.

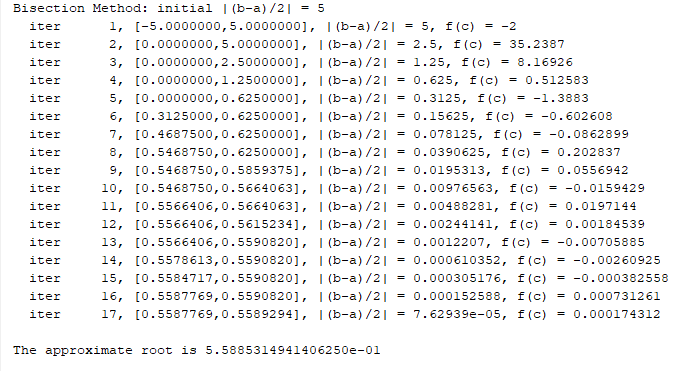
In either case, we now have a root r in the [a, b]

Step4: Go back to Step1 to repeat the process.

3. Discussion of test results

When run test\_bisect.m script with tolerance of , using starting interval of [-5, 5], test result is as follow.

Interval is smaller half as prev steps and precious will be improved 2 times



4. Explanation of results, answers to questions.

Bisect algorithm integrates 17 and find the root of is 0.5588531494.

- Why is the starting interval [-5, 5] a valid interval for the method.

f is continueous on [-5, 5], f(-5) = -118.4039 < 0, f(5) = 131.5961 > 0

therefore due to Intermediate Value Theorem(IVT), there must exist at least a number r in [-5, 5] such that f(r) = 0

-Theoretically predict the number of bisection iterations.

Therefore

* Is the result from the code consistence with your prediction.

Yes.