

Exercise Sheet 4

Exercise 1

Implement the **bisection** method for finding the root of an equation (see the notes for an example code).

Exercise 2

Implement the **secant** method for finding the root of an equation. Remember to implement a convenient stopping criterium for the algorithm.

Exercise 3

Compare the two methods when applied to the same equation, for example:

$$f(x) = \ln(x - 1) + \cos(x) \quad ,$$

with $x \in [2, 6]$.

Discuss your findings:

1. Which algorithm takes less steps on average for achieving a certain precision?
2. Try to extend the interval: do you observe convergence problems?
3. Does the secant method go sometimes outside the search interval? If so, try to combine the two methods for avoiding such a problem.