

Task for lecture 5

Consider the non-linear equation.

$$x - \cos(x) = 0 \quad (1)$$

- Solve eq. 1 using Bisection in the interval: $x_l = 0, x_h = \frac{\pi}{2}$.
Note: use 10^{-8} for accuracy.
- Print a table with atleast the following values: k, x_k, d_k .
Where $d_k = x_k - x_{k-1}$.
- Consider which other values will be relevant to print, and add these to the table.

k	x_k	d_k	?
1			
2			
3			
\vdots			

When you have printed a NICE LOOKING! table with ALL! relevant values. Then Choose one of the following methods and repeat, with 10^{-16} as accuracy.

- Solve eq. 1 using Secant in the interval: $x_l = 0, x_h = \frac{\pi}{2}$.
- Solve eq. 1 using False Position in the interval: $x_l = 0, x_h = \frac{\pi}{2}$.
- Solve eq. 1 using Ridder in the interval: $x_l = 0, x_h = \frac{\pi}{2}$.
- Solve eq. 1 using Newtons method, using $x_0 = 0$.

Finally use the values from the tables to evaluate the efficiency of each the methods.

- Pick another method and Repeat.

It is expected that for next time you have done this for atleast Bisection and one other method