

CS374: Lab Sheet 3

Ex 1) **Steffensen's method:** Write a code for the iteration formula

$$x_{n+1} = x_n - \frac{f(x_n)}{g(x_n)},$$

where $g(x) = \frac{f(x+f(x))-f(x)}{f(x)}$. Use it to find the root of $e^x - 3x = 0$ correct to four decimal digits.

Ex 2) Write a program to solve the equation $x = \tan x$ by means of Newton's method. Find the roots nearest to 4.5 and 7.7.

Ex 3) Solve Ex 2 by means of Secant method with starting values 4.5 and 7.7.

Ex 4) Write down two different fixed point procedures for finding a zero of the function $f(x) = 2x^2 + 6e^{-x} - 4$.