

Lab Assignment - Warm-up

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1 Due date:

- 8/1/2013.

2 Notes:

- Submit the codes in all R / C (or C++) corresponding to the questions.
- Make a proper documentation preferably in latex or using some other software and submit the printout of the report in .pdf form.
- Each student needs to write his/ her own solutions, even though discussions of the assignments between students are encouraged.

3 Assignments:

1. The Newton-Raphson method is an iterative process for solving the root of the equation $f(x) = 0$. According to the method, starting with an initial guess of x_0 , apply the iterative formula

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

where f denotes the derivative of the function. The iteration stops until you arrive at an acceptable limit $|x_{n+1} - x_n| < \epsilon$, where ϵ is some pre-specified tolerance value.

Write a program to approximate the root of the equation

$$3x^2 - e^x = 0,$$

to within a tolerance of 10^{-5} . Give the steps in your code and the result of executing your code. Give an explanation why your answer is reasonable. Hint: It may help to graph the function to get a decent initial estimate.